

Chapter 5: Human Capital

1. Introduction

There are some parallels between Russia's physical capital and its human capital. There are similar pitfalls, bear traps. Measured simply by numbers of people and years of education, Russia has a very large human capital stock. The question is what is happening to the quantity, and more importantly, the quality of that stock.

Russia's population is shrinking. On average, 840,000 more Russians have died than were born each year since 1993. The country is now on track for a population of 130 million by 2030 and 110 million by 2050. This decline in population has alarmed the country's leaders. Of particular immediate concern is the declining number of draft-age males. Within five years, the number of 18 year-olds will be only half what it was five years ago. But more generally, both the political leaders and many citizens are convinced that Russia's shrinking population is a threat to the country's economic development.

Here's the bear trap: this focus on numbers does not address — and can even undermine — the true concern, which is the quality of Russia's human capital. A proper human capital approach looks at not only the numbers of the population but their quality. That quality includes skills acquired through schooling and on-the-job experience and the state of health of the worker. An under-appreciated element of the quality of human capital is its geographical location. Even more than physical capital, human capital can be disadvantaged by climate and remoteness. More fundamentally, human capital needs to be seen in terms of the appropriateness of its match with the other factor of production, physical capital.

Issues such as population health, age structure, education, living standards, and even location are therefore the subjects of an investigation into human capital.

We will refer also to demography. Human capital and demography are closely related and partially overlapping concepts. Demography is about how many people there are, their ages, and how healthy they are. The size of the population is determined by three factors: how many people are born, how many die, and how many people (net) move into the country

from outside. The age structure is important because it allows one to forecast the size of the future labor force as well as how many other people (the ones too young or too old to work) that those productive members will have to support. The ratio of productive component to nonproductive is the dependency ratio.

There are some main stylized facts about Russia's demographic and human capital situation:

1. Russia's population is shrinking, more and for a longer time than almost any other country's today.
2. Russia's working age population in particular is collapsing. The number of young and old people each productive worker will have to support (the "dependency ratio") is going to rise sharply.
3. Birth rates are down. Russia shares this trend with other countries.
4. Death rates are up. This the most anomalous trend of all. Not only are they much higher than those of the rest of the world, but they have grown worse in Russia over recent decades.
5. The overall health of the population in all age groups is poor. This is of course connected to mortality.
6. The stock of skills is in question. The education system appears to be performing poorly, despite high levels of education per worker.
7. The phenomenon of "de-urbanization" is reported.

We will organize our discussion of Russia's human capital around these stylized facts of (1) population size; (2) age structure; (3) fertility; (4) mortality; (5) health; (6) education; and (7) location. For each of these elements of human capital, we will illustrate the situation, mention the proposed causes of the trend (discuss the extent to which the causes of the

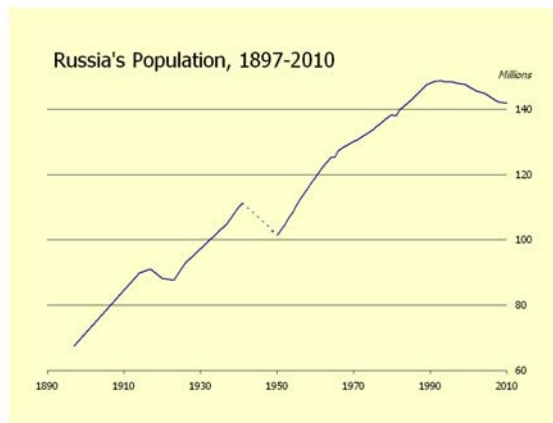


Figure 1: Russia's Population, 1897-2010

trend can be identified), discuss the consequences, and ask if remedies can be suggested. Causes, consequences, and remedies are of course connected. We are interested in knowing whether there are specific identifiable causes and consequences of a trend. But we are also concerned with whether it reflects something more fundamental that exists independent of the demographic phenomenon we are examining. In other words, is it a symptom rather than a factor in itself. As in the previous chapters on physical capital, our goal is to find if there are margins of investment in human capital which offer promise of raising Russia's economic growth in the future.¹

2. Population Size

Russia's population has been shrinking without interruption since 1993. Few other countries have lost as much of their population in recent years as Russia. Between 1995 and 2009 Russia lost a larger share of its population than all but five other countries in the world.

Closer inspection, however, suggests that the problem of population loss may not be so much a problem of Russia's policies during this period but one of its Communist legacy. Of the 19 countries of the world that lost any population at all in these years, 18 were former

¹The most comprehensive summary of Russia's current demographic condition is Eberstadt (2010). Our descriptive statistics in the following are based on many of the same and similar sources as Eberstadt. Our interpretations of the causes and consequences of the phenomena and trends often differ from his, however.

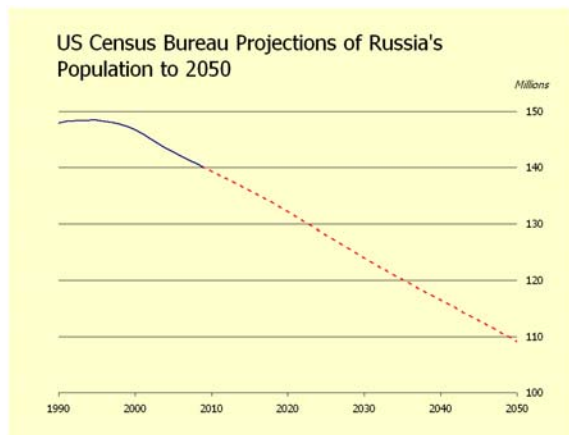


Figure 2: US Census Projections of Russia's Population to 2050

Communist countries of Eastern and Central Europe.² Not all the successor states of the USSR lost population. The Muslim countries of Central Asia grew. But here, too, the Communist legacy seems important, since even though they are growing, Muslim former Soviet countries have population growth rates that are considerably lower than Muslim countries without a Communist past.

Compared to the other non-Muslim republics of the former USSR, Russia did not fare so poorly. Combined, those other non-Muslim former Soviet republics (Armenia, Belarus, Estonia, Georgia, Latvia, Lithuania, Moldova, and Ukraine) had a population loss rate that was 56 percent higher than Russia's.³

Not only has Russia lost population for 17 years in a row, but it is projected to continue along that negative growth path for decades to come. The US Census Bureau presents a particularly dire picture, forecasting a steady drop to below 110 million by 2050. (See figure 2) The Russian State Committee on Statistics (ROSSTAT) is not as pessimistic. They offer three scenarios — high, low, and middle — and their forecasts only extend to 2030. But even the lowest scenario is higher than the US forecast for 2030. The high scenario is some 20 percent higher.

²The sole exception was Lesotho, which lost only 0.2%.

³The world leader in population loss, incidentally, was NATO and EU member Bulgaria, which shrunk more than twice as fast as Russia.

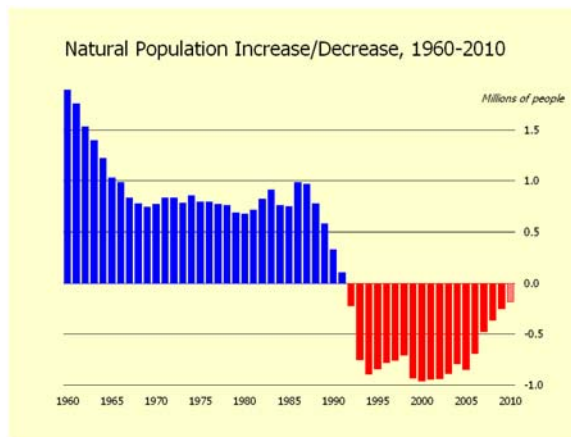


Figure 3: Natural Population Increase/Decrease, 1960-2010

Russia has actually seen a net increase in migration into the country over the period when its overall population shrank. In other words, its population dynamics are driven mainly by its fertility and mortality trends: birth rates exceed death rates. The net result of births and deaths is referred to as the “natural” increase or decrease of the population. Within a brief period of a few years before and after 1990 that net figure shifted from plus one million a year to negative one million a year, as is evident in figure 3.

Russia’s negative population growth has alarmed its leaders, its citizens, and many observers in the West. It is perhaps the major component of the proclaimed demographic “crisis” in Russia. Surely, something strange is happening in Russia. This sustained population decrease is indeed anomalous. And we will describe other demographic trends that are even more unusual, sometimes bewilderingly so. But our concern is economics. And no matter how unusual a phenomenon is, we still need to ask, “so what?” How does it matter for economic growth? In the context of this report, to deserve the label of “crisis” the trend in question must be shown to have strong negative consequences for Russia’s future economic development.

Is that the case for negative population growth? Why should the Russians or anyone else, care about population size per se? Prestige might be a reason. Russians — both the leadership and many of its citizens — are concerned about Russia’s status as a “Great Power.”

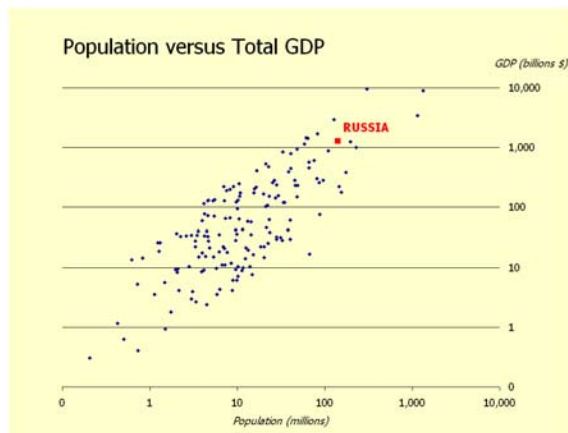


Figure 4: Population and GDP Across Countries

For them there is no question that a necessary attribute of Greatness is Bigness. At the time of its disappearance, the Soviet Union was the third most populous country in the world, considerably bigger than the United States. Russia today is in eighth place, and for the prestige-minded the prospect of slipping further down in the ranks is bitter. Of course, population size is but one dimension of “bigness.” Territory is another. Russia is the largest country in the world by territory. But what about economic size? There is a rather obvious positive correlation between population size and total wealth: big countries are big economically; and Russia fits in precisely where one would expect. Russia is the eighth largest country in the world by both population and total wealth (see figure.4).

Is there a relationship between population growth and measures of economic performance, e.g., growth in per capita GDP? Is a growing population a boon or bane for efforts to improve per capita GDP? A simple scatter plot (figure 5) of these two indices measured over the period of 1970-2008 shows that there is a correlation, but that it is negative: the slower the country’s population growth, the faster its per capita GDP growth. This follows of course from the neoclassical growth model, where the steady state capital-labor ratio and the level of per-capita income are inversely related to the population growth rate.⁴

⁴And it is also apparent in the growth regressions we report in chapter 2. In the Levine-Renelt equation and in our own variation the coefficient on population growth was negative.

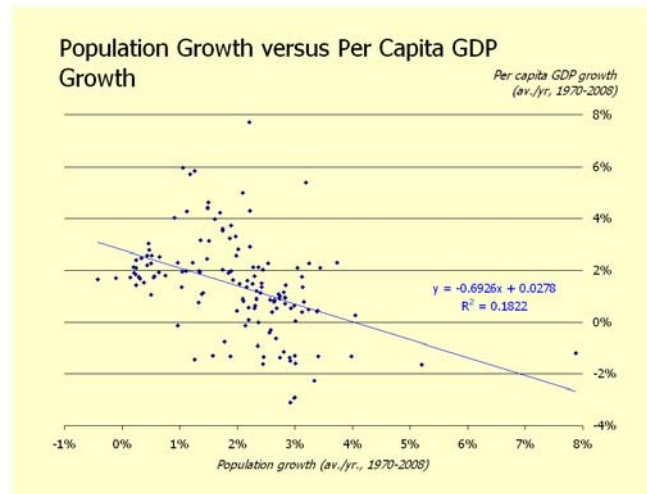


Figure 5: Population Growth versus Per Capita GDP Growth

The bottom line is that while concerns about population size and population growth may be important for the exponents of Great Power thinking in Russia today, there is no reason to think that the country needs to have a growing population if its main goal is economic welfare. In fact, efforts targeted to promote population growth in itself may be at odds with the goal of increasing individual wealth and welfare.

2.1. Age Structure

There are several concerns about the age structure of Russia's population that are worth consideration. One is that Russia's working age population is expected to shrink at an even faster rate than the overall population (see figure 6).⁵ Another age-structure concern is the cohort of women of child-bearing age. The number of babies born in the future depends on the number of women capable of giving birth as well as the number each one is likely to bear (fertility rate). If the forecasts of Russia's population made by the US Census Bureau are borne out, it is apparent why it is likely that births will decline. Those forecasts show the cohort of women aged 16-39 decreasing by over one-third by 2030.

⁵Note that the definition of "working age" can and does vary. We will discuss this later. Here we use a range of 20-64 years for both men and women, in contrast to the Russian legislated definition of 16-59 for men and 16-54 for women.

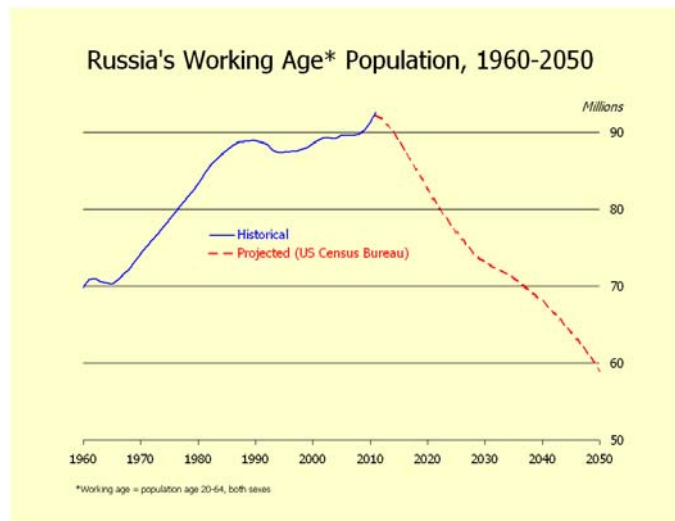


Figure 6: Russia's Working Age Population

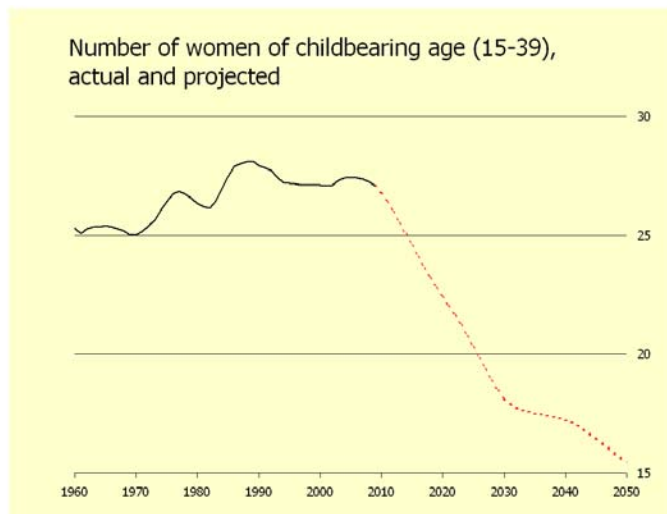


Figure 7: Number of Women of Childbearing Age (15-39), actual and projected

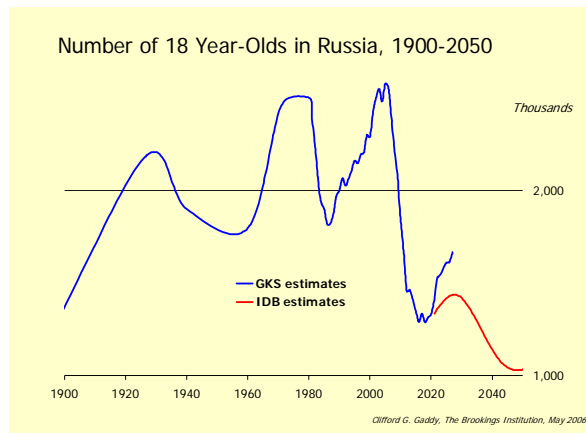


Figure 8: Number of 18 Year-Olds in Russia, 1900-2050

A third specific widely discussed age-structure concern is the number of 18 year old males, since these represent the pool of draft-age men. Five years ago Russia had more 18-year olds than ever before in its history. But with the next ten years that number may drop to the lowest in 100 years. Adding to the issue is the ethnic composition of the draft pool (a growing share of Muslims). This prospect has produced near-panic among military establishment. They propose increasing the pool of draft-eligible men by extending the age of selection for service to 30, and so on. The effects of such a measure on the civilian economy would be huge. The unavoidable reality of a very much reduced pool of men is more likely to lead to more radical reform. The military doctrine already has abandoned the idea of a mass “mobilization army.”

All this said, the most important aspect of age structure of the population is the ratio of productive members of the population (those active in the labor force) to others not in the labor force. This is the dependency ratio.⁶ When the dependency ratio is low economies experience a “demographic dividend,” as savings per-capita will be higher. When the dependency ratio rises growth prospects deteriorate since the same pool of workers must support a larger pool of young and old.

⁶The importance of the dependency ratio for growth prospects of developing countries has been studied by Bloom and Williamson (1997) and Bloom, Canning and Sevilla (2001), who emphasized the role of the demographic dividend in explaining the performance of the Asian Tigers.

Since working age differs, the definitions of “young” and “old” necessarily also differ. But if we define the working age segment of the population as all men and women between the ages of 20 and 64, the picture of past, present and future dependency ratios for Russia is given in figure 9.

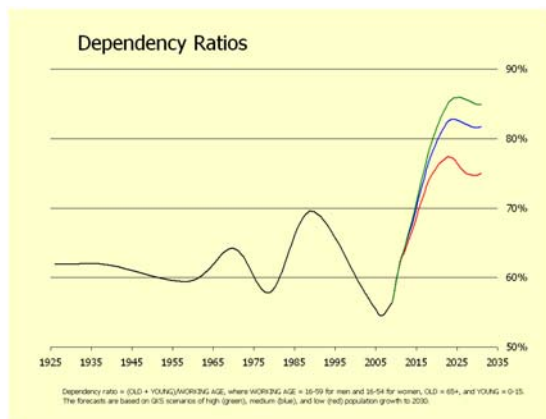


Figure 9: Dependency Ratios

It is clear that the dependency ratio in Russia is increasing from the relatively favorable ratios of the mid 2000’s period. By this measure the productive part of the population has seen its burden reduced for nearly 20 years or so. But the burden is now about to rise steeply. How does the picture for Russia compare with other countries? In figure 10 we display the dependency ratios of the US, Sweden, Australia, Japan, and Russia. In addition we show the forecast for Russia. This shows that Russia is not going to be entering totally uncharted territory. Japan and others have had dependency ratios that high before. The problem for Russia is that it may be reaching such levels of the dependency ratios as lower levels of per-capita income than other countries.

It is important to note that there may be a difference in how the dependency ratio is composed. The “burden” part — the numerator of the ratio — is the sum of *young* and *old*. Eberstadt (2009) points out that the old in all societies consume more than the young and that therefore their burden is greater. This trend is likely to become even stronger with improvements in medical care, which focus expenditure on the last years of an extending life

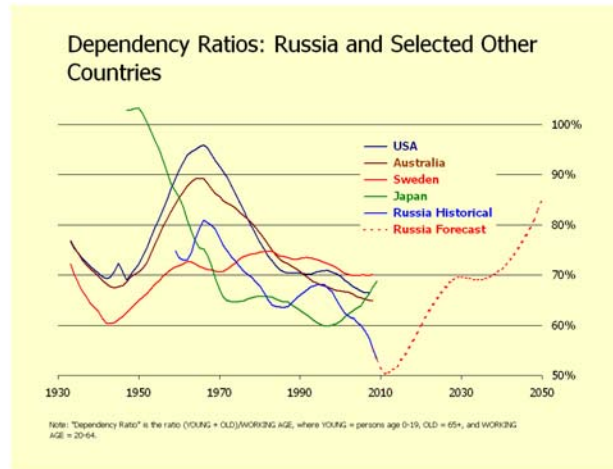


Figure 10: The Dependency Ratio in Selected Countries and Forecasts for Russia

span. A breakdown of the aggregate dependency ratio into separate ratios for *young* and *old* might therefore be instructive.

Table 1: Composition of Dependency Ratios

	$\frac{Young}{WA}$	$\frac{Old}{WA}$	$\frac{Old+Young}{WA}$
Sweden (2008)	40%	30%	70%
Japan (2009)	31%	38%	69%
USA (2007)	46%	21%	66%
Russia (2009)	33%	20%	53%
Russia (2030)	34%	36%	70%
Russia (2050)	36%	49%	85%

Note: YOUNG = ages 0-19; OLD = 65 and over; WA (workingage) = 20-64.

Historical data from the Human Mortality Database [www.mortality.org]. The figures for Russia for 2030 and 2050 are based on population projections by the US Census Bureau

Table 2:

The data in table 2 shows that even in the pessimistic scenarios of population dynamics published by the US Census Bureau, it would not be until after 2030 that Russia’s dependency ratios exceed those of other developed countries today. The question for Russia is then whether it can reach per-capita income levels consistent with those dependency ratios by then.

2.2. Mortality

This is the most anomalous trend of all. Some of these statistics can only evoke wonder and worry. Figure 11 below shows that death rates (deaths per 1,000 population) rose almost continuously in Russia from the early 1960s until the mid-1990s. Only a few years in the mid-1980s were an exception.⁷ Since 1995 the picture has been mixed. The modest good news is that death rates have declined for the past 5-6 years, although they still remain nearly double what they were a half century ago. It is especially male death rates that alarm. The picture



Figure 11: Death Rates, 1950-2010

is striking. It is hard to exaggerate how bad male death rates are. Russian males in prime working age — 25 to 55 — are dying at rates 4 to 4.5 times higher than Americans, and 7 to 11 times higher than Swedes. But the biggest discrepancy of all is among the youngest groups, those in their 30s. Russia has a death rate for 30-34 year-old men that is around five times that of the US and a whole order of magnitude higher than Scandinavia, the Netherlands, and Japan. The last time Sweden had a death rate as high as Russia's today for its 30-34 year olds was 1876 (except for the single year of the 1918 epidemic). Russian 26 year old men die at the same rate as Swedish 56 year olds. Equally strange is that the death rates have increased so much over time, and have been increasing since 1960 at the latest. Figure 13 shows that the

⁷This break in the trend is generally attributed to Mikhail Gorbachev's anti-alcohol campaign.

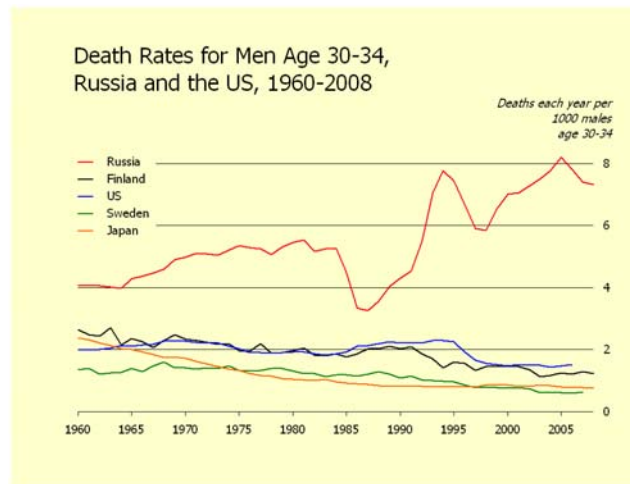


Figure 12: Death Rates for Men Age 30-34, Russia and the US, 1960-2008

deterioration of mortality among Russian males has been highest in the prime working ages of 35-50. The reasons for the high mortality are surely complicated.⁸ Life-style choices play a

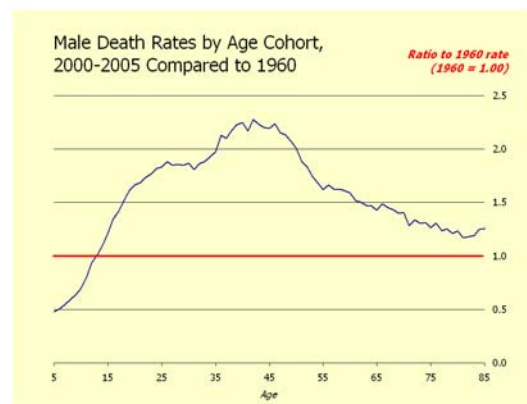


Figure 13: Male Death Rates by Age Cohort, 2000-2005 Compared to 1960

key role. All too many Russian men are drinking themselves to death.⁹ Smoking is another

⁸See Denisova (2009) for a recent independent analysis and discussion of other studies, Russian and Western.

⁹Exactly what is causing the heavy drinking itself, however, is not clear. On the one hand, the real (inflation-adjusted) price of vodka today is roughly one-tenth of what it was in 1988 under Gorbachev. Some of that relative cheapening of alcohol occurred immediately after abandonment of Gorbachev's anti-alcohol campaign. But much of it happened since 2000. Add to that the rise in workers' wages in the past few years and we have the following fact: in 1999, the average industrial worker could buy 28 liters of vodka for his monthly wage. Today, he can buy 78 bottles. This would suggest that incomes and relative prices have played a role in rising rates of alcohol consumption and (therefore) rising death rates. But in her micro-analysis Denisova (2009) finds that the relative price of alcohol is a statistically insignificant factor in mortality.

factor, shown in a recent study to be comparable in effect to drinking.¹⁰

Whatever the causes, the deaths of so many men in these ages represents a significant loss of Russia's potential labor force. One way to gauge how big the loss is, would be to take a country such as Sweden as a benchmark. We follow the current Russian definition of working age — 16-59 for men and 16-54 for women — and calculate how many potential working years are lost in aggregate due to excess deaths (the excess of Russia's age-specific death rates for males and females over Sweden's). We include the other so-called BRIC countries (Brazil, India, and China) for further reference. As figure 14 shows, Russia is losing some 18 percent of working years for men compared to less than three percent for Sweden. This is quite a dramatic difference.

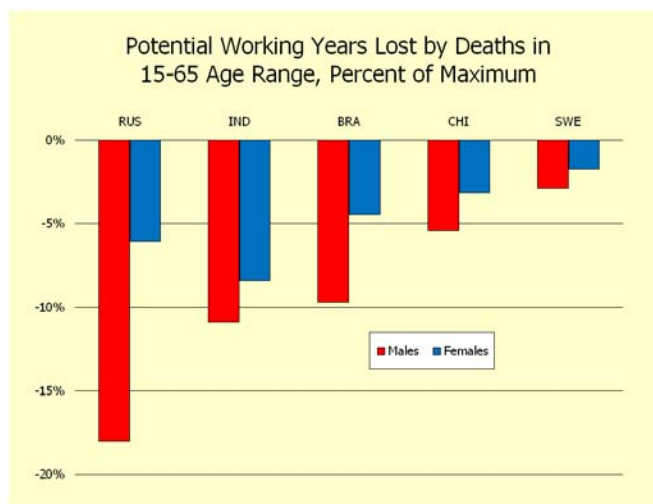


Figure 14: Potential Working Years Lost by Deaths in 15-65 Age Range, Percent of Maximum

If measures could be taken to reduce the gap in excess deaths among working age men and women, that would, of course, expand the pool of productive workers. It could help compensate for the declining size of birth cohorts in the future. If nothing else were changed, it would also mean that the dependency ratios would improve (be reduced). However, this does not take into consideration the fact that an improvement in survival rates among those of working age will likely also be accompanied by an improvement for older ages as well.

¹⁰Denisova (2009).

Therefore the ratio of OLD/WA might not improve at all. That would imply that moving to a “Swedish” survival pattern would not improve (reduce) that part of the dependency ratio. Recall from the Table above that Russia’s ratio of OLD/WA today is 0.20; Sweden’s is 0.30.

If, then, improved survival does not lead to lower dependency ratios, it is clear that the only way to raise per capita wealth for the entire population is to make each working age person more productive. This brings us back to the economic growth exercise. In particular, we must move beyond mere numbers of workers to consider the other attributes of human capital, those that reflect quality: health, education, and location. These are considered in the next three sections.

3. Health

The evidence for the effects of health on economic growth is decidedly mixed. The main arguments for including measures of health in measures of human capital are summed up in the introductory section of a recent volume entitled *Health and Economic Growth*:

“Good health raises levels of human capital, and this has a positive effect on individual productivity and on economic growth rates. Better health increases workforce productivity by reducing incapacity, debility, and the number of days lost to sick leave, and increases the opportunities an individual has of obtaining better paid work. Further, good health helps to forge improved levels of education by increasing levels of schooling and scholastic performance.”¹¹

Morbidity (illness), of course, is closely connected to and correlated with mortality. Indeed, empirical work on health frequently uses measures of mortality — life expectancies, survival rates, death rates — as proxies for health because the data is more readily accessible. Strictly speaking, the concepts are different and at least in theory they might have different implications for economic analysis. The death of an individual will reduce the actual or potential

¹¹Lopez-Casnovas et al., 2005.

stock of human capital (if the person is of working age or younger). If that person were instead to fall victim to a permanently debilitating illness but survive, there would be the same loss of human capital but in addition there would be an extra burden as the person also now joins the ranks of the nonproductive. In that sense morbidity can be worse than mortality.¹²

The sticking point is that while better health might lead to greater productivity on the part of the individual worker (following the apparently obvious line of argument presented in the quote above), the overall societal effect can be different. For one thing, better health usually means better survival rates for the dependent part of the population. Therefore, the greater wealth produced by the individually more productive worker has to be shared among more dependents. There is also a so-called capital dilution argument: as more workers survive, a given stock of physical capital is shared among more workers.

Research on the contribution of good health to economic growth in the 1990s and early 2000s seemed to show that health has a strong positive impact on economic growth, at least for developing countries (and over the long period of Western economic development). At the macro level there is no question of a correlation between health and wealth. The issue is the causality. Does health promote wealth, or does wealth lead to better health? Or are both the result of unmeasured third factors? A number of more recent studies argue that improved health leads to little, no, or even negative results for economic growth.¹³

The data for this research was drawn primarily from developing countries. The reason for this is that the variation in both health outcomes and growth performance is higher amongst these countries, so the effects should be easier to tease out in this setting.¹⁴ Bhargava et al. (2001) used a cross-section of poor and rich countries. They found a positive effect of increased adult survival rates (ASRs) on GDP growth rates. But the effect was small, even for the poorest countries: a 1 percentage point increase in ASR was associated with a 0.014

¹²This could be another example of the τ -effect. Suppose that Russia has significantly higher morbidity than other countries. Since Russian has high educational attainment it accumulates significant human capital. But if morbidity is high much of this human capital cannot be used. So measured human capital is higher than actual, effective, human capital.

¹³See Acemoglu and Johnson (2007), Ashraf, Lester, and Weil (2008), and Weil (2007).

¹⁴This is important because research shows how hard it is to find a statistically significant effect.

percentage point increase in the growth rate. (In other words, increasing the ASR from, say, 40 percent to 60 percent — a very substantial improvement — would result in an extra 0.25 percent of annual growth.) More important for our analysis, Bhargava et al. concluded that the positive effects of ASR on economic growth rates disappeared entirely for richer countries. For countries at Russia’s current level of per capita GDP, the net effect of raising the survival ratio was negative.

Perhaps a more serious problem for analyzing Russia in this context of wealth versus health is that Russia already enjoys a level of wealth (per capita GDP) that would seem to be thoroughly unwarranted given the poor health of the population. A scatter plot of adult survival ratios (ASR) versus per capita GDP (figure.15) illustrates the point. Russia appears to be a huge outlier. One way to view Russia’s position in figure 15 is that given Russia’s

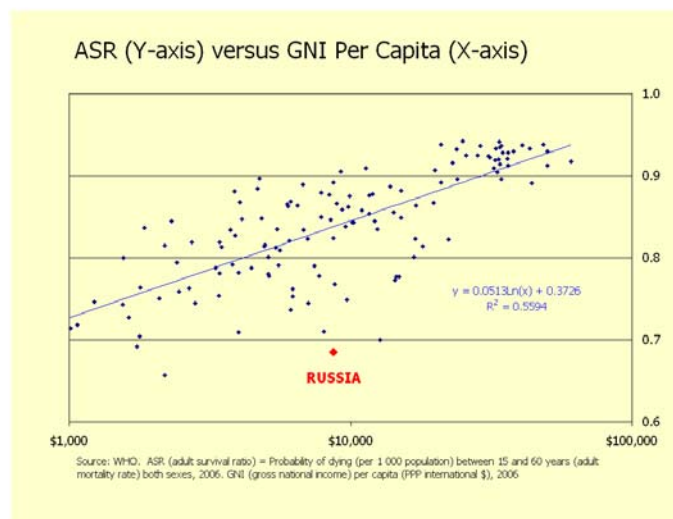


Figure 15: Adult Survival Rate versus GDP per-capita

GDP it should have a much higher ASR. The most likely reason is that Russia’s resource wealth has given it a per-capita income much greater than its social capital would suggest. This suggests that the impact on GDP per-capita would be small from improving Russia’s health. It is not at all clear that per capita incomes would rise very much.

At the micro level it is apparent that one of the channels through which better health and survival ratios exert a positive impact on wealth is by inducing individuals to invest more in their education. This is why many analysts presume that better health will lead to faster growth. The fact that this effect does not appear in the macro data is surprising, but robust. Moreover, as we will see below, Russians already invest in education at a very high rate. The problem for Russia is not the measured quantity of education, but rather its quality. That is not something likely to be affected by improvements in health

In sum, health investment is properly treated not as investment at all but as consumption. As virtually everyone would agree, “Good health is a crucial component of overall well-being.”¹⁵ But that is it. As counterintuitive as it may seem, there is no evidence that Russia’s growth prospects are impaired by its abysmal health performance. Hence, we conclude that improving health is not a silver bullet for ensuring Russia’s future economic growth. While it almost certainly can be justified to spend money to improve citizens’ health for welfare or humanitarian reasons, it would be a mistake to assume that this is an investment that will “pay for itself” by contributing to more economic growth. Russia could spend great amounts on preventive and curative health care, enlightenment, and so on, and succeed in reducing deaths, and yet find that economic performance fails to improve at all because the factors that led to high mortality in the absence of the remedies are still there, and it is those factors, not the mortality per se, that was causing bad performance.

4. Education

As in the case of physical capital investment, human capital investment is assumed to be appropriate to what the market demands. We do not worry that measuring the stock of human capital by accumulated investments will lead to systematic errors. This is because in normal economies, we do not worry that a country will accumulate “the wrong education” on a systematic scale. But in the Russian case, this is an important consideration, since the Soviet

¹⁵Lopez-Casnovas et al. (2005), p. 3.

economy demanded a different kind of education stock, one appropriate for a planned economy. Moreover, even if this inherited stock was overvalued, is this disappearing as a problem? This will be true only to the extent that the post-Soviet education system is properly suited to the market. As we shall explain, the forces that preserve legacies in relation to physical capital, operate in a similar, if not stronger, manner with regard to human capital. Hence, education investments currently being made are still being overvalued.

Education has traditionally been the main measure of the quality of human capital. Human capital is a stock of “skills.” Those skills are typically measured by years of education. This is primarily the result of a lack of alternative data, and for most countries this does not introduce serious biases. But in Russia this is problematic. The education component of Russia’s human capital is mismeasured. If the quality and appropriateness of education are not matched to the needs the quantity is overestimated.

There is much we do not know about the quality of Russian education. Eberstadt (2010) cites statistics on Russian youths’ poor performance in subjects compared to other countries (the so-called PISA study). But these are averages for the entire population. We know that there is great inequality in so many other indicators, from health, life expectancy, income. It is likely that this carries over to educational quality. Perhaps extraordinarily high levels for some substantial part of the population are being pulled down by very low levels among others. The issue for productivity is then whether having a population that is moderately well-educated across the board is better than having one that is generally less well educated but with a pool of superstars. To put it differently, which is better for growth: having a critical mass of Sergey Brins or just a general average level of education? Growth theory has not, as of yet, dealt with the distribution of human capital. And there does not appear to be any empirical studies that answer that question either.

There may be other considerations – equity is one – for desiring broad-based educational improvement. These may lead to increased welfare, and to the sustainability of democracy. But there is little evidence that these factors affect a country’s long-term growth potential,

despite what may seem to be an intuitive connection.

In general, however, one could conclude that for an economy with a tightening supply of labor (the “shrinking” potential labor force) as Russia appears to becoming, education programs that maximize ability to adapt, to change occupational track, may be more important than absolute levels of education that is suited only to specific technologies. Indeed, if having a higher level of specialized education makes an individual less likely to “re-tool” oneself for a new occupation, it may be the case that more education is worse, not better.

The argument here is consistent with addiction. The dinosaur factory inherited from the Soviet Union commands rents precisely because it represents so much sunk investment. This is investment not only in physical capital – the machines, buildings, and so on – but also in human capital, including education. In fact, the argument for allotting more rents to the Soviet-era dinosaur factories is strengthened by the argument that “the workers cannot move, and they cannot change occupation.” The more that has been spent to develop the current structure, the greater the claim for future rents.¹⁶

“Appropriateness” is important concept. Human capital enhances productivity if it is complimentary to physical capital. If human capital is inappropriate for what is needed it will not contribute to production. The education might have been the right one for the Soviet system, with its incentives, but not right for a market economy.

Individuals of course can and have indeed chose different tracks as the market economy has developed. For example, there has been a big shift towards business and economics training in Russia. This represents a positive development. But the overall level of education has not improved.

There is a one important difference between mismeasured human capital and mismeasured physical capital. The latter means that less is returned for a given level of sacrifice. It must means that you have actually invested less than you thought, and that more sacrifice is needed to get what you expected to earn. In the case of human capital the problem is different. Here

¹⁶Addiction and subsidization are thus both related to ignoring the dictum that sunk costs are sunk.

it is not a question of the *level* but of the *type*. With misallocated human capital more is not a solution. Two humanities PhD's cannot substitute for an accountant.

In the case of human capital what is needed is reform of the educational system to produce the right kinds of human capital – those that are demanded by the market economy. The problem is that the addictive nature of the system makes it hard to reform education.

4.1. Location

We examined the general problem of mislocation of factors of production in Chapter 3. The temperature per capita (TPC) index we introduced in that chapter was intended to give us a crude instrument to estimate the extent of mismeasurement (the τ factor) that might be attributed to spatial misallocation of Russia's capital. The TPC applies to human capital as well as physical capital. (In fact, of course, the TPC is a measure of human population in different regions, because population was used as a proxy for all economic activity.). Thus if we studied Russian economic growth using a human capital augmented production function, say of the form:

$$Y_t = K_t^\alpha H_t^\beta [A_t L_t]^{1-\alpha-\beta} \quad (1)$$

where $\alpha, \beta \in [0, 1], \alpha + \beta \in [0, 1]$, and t denotes time. Here K and H are physical and human capital respectively, and AL is productivity augmented labor. If we measure the contributions to growth with this model, *and if* there is a measurement problem with human capital, then we will attribute inferior results to low productivity. Just as we argued that $\tau < 1$ ought to be applied as a discount factor to K to control for mismeasurement of physical capital, we require a similar factor for human capital. We would have something of the form:

$$Y_t = \tau_K K_t^\alpha \tau_H H_t^\beta [A_t L_t]^{1-\alpha-\beta} \quad (2)$$

where $\tau_K, \tau_H \in [0, 1]$ are discount factors to offset the impact of spatial and legacy effects on the measurement of asset stocks in Russia.

Applying the τ -factor argument to human capital, we can say that one of the reasons Russia's human capital is less than it appears to be is because it is located in the wrong place. But the primary problem is that the *stock* of human capital is less effective than its aggregate measure implies.

4.1.1. *De-urbanization?*

There has been some discussion of the trend that "Russia is becoming de-urbanized."¹⁷ Indeed, by aggregate statistics alone, the trend would appear indisputable. Between 1991 and 2009, Russia's official statistics on the percentage of the population classified as urban show a declining urban share in 42 of the country's 78 regions. In the country as a whole, the urban share declined from 73.8 percent to 73.1 percent.

However, it turns out that the decline in the number reflects changes in the definition of urban versus rural — changes apparently implemented unevenly and inconsistently throughout the country.¹⁸ The statistical decline did not reflect a shift of population out of cities to the countryside.

A more meaningful concept to measure urbanization or deurbanization in the Russian context would be the population dynamics of large cities. If one looks at cities that had a population of over half a million in 1991 (a total of 33 in all), that group has on net gained population in absolute terms since then. Admittedly, most of the gain was due to Moscow. Not including Moscow, these large cities showed a modest loss in population (-1.8 percent in total over 18 years). But that is a substantially slower rate than Russia's overall population loss in the period (-4.4 percent). That means that Russia did not "de-urbanize" in this sense. Relatively speaking, Russia urbanized by 7.8 percent between 1991 and 2009.

But of course the real problem is that some of this urban growth was in cities that should

¹⁷Eberstadt, pp. 26ff.

¹⁸The case of Sverdlovsk oblast is a good example. Between 2004 and 2005, its urban share allegedly dropped from 88 percent to 83 percent, a fact which, if true, would have involved a sudden mass migration of city dwellers to the countryside. What actually happened was that the regional statistics agency reclassified some 70 "population points" as rural rather than urban. No real population shift took place.

not have grown. Russia's problem of shrinking cities, if there is one, is not that the trend represents "de-urbanization." In one sense Russia badly needs to "de-urbanize." That is, it needs to shrink cities that are mislocated. Moscow is the bright spot. But it should be even brighter. When cities like Novosibirsk, and Omsk, and Perm lose population it is nothing to lament. They are far larger than they by rights should be.

5. Conclusion

To deal with physical capital problem you deal with addiction. To deal with human capital education problems you need to fix education policy. The current educational system limits mobility and so fuels lock-in. This reinforces the persistence of educational legacies that are not conducive to a market economy. A better educational system would enhance labor mobility and then would make it hard to keep labor in the regions. If you fixed the educational system it would exacerbate regional differences because graduates would want to locate in the winner regions. The current educational system is more likely to produce young people for loser regions than a reformed educational system.

So the current educational system supports industrial feudalism. Hence, it is not a surprise that industrial feudalists support the current educational system. The current system helps to produce more claims for addiction. Each new miseducated young person is a forty-year claim on resources for a loser region. This is the primary force that makes education is so hard to reform.

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