Human Development Series

Wolfgang Lutz and Nicholas Gailey

# Depopulation

## as a Policy Challenge in the Context of Global Demographic Trends

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# Introduction: Population Decline from a Historical Perspective

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Human populations have survived cycles of growth and decline in their numbers throughout history. Up until the late 1800s, changes in death and migration rates were the main forces behind fluctuations in population size all around the world, after which declining birth rates became a third important factor. Depopulation confronted many parts of Europe, such as in the territory of today's Republic of Ireland. Its population declined from 6.5M in 1841 to 5.1M within ten years during the "Great Famine," and was followed by continued losses, with the population bottoming out at 2.8M in 1961 (McCarthy, 1961). While this came with massive disruptions to society at the time, it did not prevent the Irish population from recovering to a degree, and later becoming a textbook example of developmental success.

**In historical context, the population decline now in Serbia and other Southeastern European countries is not unprecedented, nor does it necessarily imply doom for the future.**

In this introductory section we will put these concerns in a global demographic and historical perspective.

There may even have been instances in our early history when homo sapiens were close to extinction. Three main threats directly affected human mortality in historical context: food shortages, diseases, and conflict. When the Neolithic revolution some 12000 years ago led to more bountiful and stable food supplies, this resulted in a marked increase in the human population. But it is estimated that up until 1500 the world population stayed well under 500M. In the mid-14th century, the total world population actually declined; the bubonic plague ended an unprecedented number of lives – estimates range from 35 to 200M people died from contracting the plague (see Table 1). It took more than 100 years following the bubonic plague for population growth to resume its earlier trajectory.

The one billion mark for the human population was only reached in the early 19th century, with the year 1804 often given as an estimate of this milestone. The second billion came in 1927, and the third already by 1960 after a much shorter period. Despite generally high fertility rates of the time, the mortality rates, particularly among children, kept population growth to a relatively slower pace than it could have reached. The recurrent pandemics shown in Table 1 were only one reason for this high level of mortality, with the main causes lying in chronic conditions of malnutrition and the high prevalence of common infectious diseases. By 1850, life expectancy was quite consistent across Europe at around 40 years, with only minor regional differences. Today, newborn children in Europe can expect to live more than twice that number of years.

**Table 1.**
**Summary of most important pandemics since 1300**

| Death estimates based on various sources as given by LePan (2020) and World Health Organization (2020) | | M-Millions, K-Thousands |
|---|---|---|
| 1331-1351 | Bubonic Plague | 35-200 M |
| 1520 | Smallpox | 56 M |
| 17th Century | Plague Outbreaks | 3 M |
| 1817-1923 | Cholera Outbreaks | 1 M |
| 1855 | The "Third Plague" | 12 M |
| 1889-90 | "Russian Flu" | 1 M |
| 1918-19 | "Spanish Flu" | 40-50 M |
| 1957-58 | "Asian Flu" | 1.1 M |
| 1968-70 | "Hongkong Flu" | 1 M |
| 1991-present | HIV/AIDS | 25-35 M |
| 2002-3 | SARS | 770 |
| 2009-10 | "Swine Flu" | 200 K |
| 2012-present | MERS | 850+ |
| 2014-16 | Ebola | 11.2 K |
| 2019-by Oct 2020 | COVID-19 | above 1 M |

A constant struggle for survival led to virtually all traditional cultural value systems and religions placing a strong emphasis on reproduction to enhance population growth and avoid decline, as any meaningful influence society had over mortality levels remained beyond reach. In Abrahamic tradition, "be fruitful and multiply" was the essential command that God gave to Adam and Eve, according to the book Genesis, sentiments echoed by many other cultures.[1] The value of greater population growth even included the realm of political power and governance, as written in the Bible's Proverbs 14:28: "In the multitude of people is the king's glory." Roman philosophers were of largely the same mindset, with many arguing in favor of early marriage, taxes for celibacy, and rewards for marriage and parenthood (Goswami, 1985).

However, already in ancient Greece the philosopher Plato had speculated about an optimal population size, which implied that already there was a conception that there could be too many people as well as too few, depending on the circumstances. He suggested the ideal population size for a Greek city state would be at a constant level of 5,040 households, mostly because the number is conveniently divisible by many numbers (including 12, which had a sacred dimension in ancient Greece), as well as this numerical limit helping people to capably perform their roles as citizens by knowing the community and avoiding anonymity.[2] Debates on the relative merits of a small or large population were also being held in ancient China as far back as the 6th century B.C.E. (Xueyuan, 2019).

During most of the Middle Ages, when social phenomena were viewed in fatalistic terms and population growth was valued as a by-product of nature, Henry IV of England made a famous statement connecting the viability of the state to the well-being of those who live in the kingdom and the sheer size of the population: "The strength and riches of kings consist in the number and opulence of their subjects," he supposedly said around the year 1400 (Stangeland, 1904). Around the same time the Arab philosopher and historian Ibn Khaldun in Tunis wrote about the economic benefits of a growing population as it created the conditions for increasing specialization and division of labor, which in turn would lead to higher incomes.[3]

The connection between population growth and economy was also stressed by the Mercantilists in England, in particular John Graunt, William Petty, and Edmund Halley as well as Johann Peter Süssmilch in Prussia. These 17th century thinkers held the view that the nations strongest in people and material goods would survive and prevail over others. Quite specific policy recommendations flowed from this outlook, such as penalties for non-marriage, or limiting out-migration (except to their colonies). In 1662 John Graunt, who is sometimes called the father of demography, published the "Bills of Mortality" which are the first known statistical tables in demography. He famously showed that for every 100 children born in London only 16 were still alive at age 36, and only 3 at age 66 (Graunt, 1662). This extremely high level of mortality, seen from today's perspective, also showed that the biggest potential for enhancing population growth was in the reduction of child mortality. This is what actually happened in the beginning of the demographic transition in the 19th century, but it was not considered as a viable option before modern medicine and hygiene, and therefore the discussion at the time of Graunt and the Mercantilists focused mostly on fertility.

Reproduction was also the main focus of Robert Malthus, who believed that human beings like plants or animals are "impelled" to grow by a powerful "instinct" until they are held back by certain limits. He saw the decisive limit to human population growth in the availability of food and what he called the means of subsistence. Malthus famously argued that while the population grows geometrically (exponentially) the food supply could only grow linearly due to limited availability of land and the diminishing returns to labor input. He thus predicted repeated famines that would stop population growth (positive checks) when growth would hit such limits. He did not overlook the possibility of voluntary reductions in fertility (preventive checks) through celibacy or abstinence within marriage, though he considered this unrealistic because "the passion between the sexes will never diminish" (Malthus, 1798).

This perspective on human nature and the inclinations for populations to grow has survived as a powerful narrative up to this day and has since found different expressions. It notably inspired the 1972 report "The Limits to Growth," published by the Club of Rome (Meadows et al., 1972). This scientific report has had the highest number of published copies in history, and used computer simulation methods to put numbers on the Malthusian claims noted above, with the addition of oil supplies as a decisive limiting factor as well as the limited factor of food supply. In the same tradition, the two influential books "The Population Bomb" and "The Population Explosion," both by the biologist Paul Ehrlich (Ehrlich, 1968; Ehrlich and Ehrlich, 1990) have greatly contributed to raising global political attention with respect to the potential dangers associated with rapid world population growth. In recent years this fear of population growth has been linked to directly contributing to greenhouse gas emissions, and making it more difficult to adapt to already unavoidable climate change (IPCC, 2014).

Notwithstanding these concerns about the dangers associated with rapid population growth, in the field of national politics a growing population continued to be mostly seen as something desirable. Changing population size at this level has always been closely linked to the perceived viability of states and their strength relative to neighboring populations, exemplified by the traditional Franco-German struggle for influence and survival.

1 For example, also in Hinduism, see Gudorf's "Comparative Religious Ethics: Everyday Decisions for Our Everyday Lives" as well as various cultures of Sub-Saharan Africa, see Manuh and Sutherland-Addy's "Africa in Contemporary Perspective".

2 For more information, *see Plato's Laws*.

3 For more information, *see Ibn Kaldun's Al-Muqaddimah ("The Prologue")*.

After French defeat in the 1870-1871 war, divergent demographic trends received much more attention, where the markedly lower French fertility in the preceding decades was linked to weakness on the battlefield.

Even people of sharply different philosophical views at the time agreed on population matters. As expressed by demographer Arsène Dumont, "a nation must have a population dense enough to keep stable an equilibrium with her neighbors" (Dumont, as cited in Teitelbaum and Winter, 1985). Dumont sought balance to what he described as the growing unintended consequences of modern life on reproduction, known as "social capillarity," or the limiting of fertility when it was advantageous to climb the social ladders. "From the moment when the imagination and the attraction of the ideal enter the scene, we find ourselves in the presence of a new principle of population," he argued as the trends marched on. Upon surveying the French census results in 1907, an unnamed German professor is reported to have said, "more coffins than cradles: this is the beginning of the end... Finis Galliae" (Savant, as cited in Teitelbaum and Winter, 1985). In the years that followed, these realizations gave birth to France's demographic fears and cycles of pro-natalism, a tradition that carries on in some form to this day and inspired the thinking in many countries beyond France.

The causes of contemporary population declines, low fertility rates, and high out-migration are linked to a high degree of individual agency and is relatively new in the scope of human history. Rather than being determined more directly by nature or unavoidable events, these population declines flow from modern life and the broader passage of demographic behaviors – fertility, mortality, and migration – deeper into the sphere of personal control.

**Demographic behaviors are still not simply "elective" or independent of outside influence, however. A number of competing responsibilities and barriers exist that discourage people from having the family sizes they reportedly desire, 2.2 children on average in Europe (OECD, 2016) and migration often involves an element of being pushed, out of economic necessity.**

Contemporary population change, to the extent it is driven by persistent transfers of people from one region to another, is perhaps the most consequential, long-term aspect of international relations. As the dynamic between countries is less rivalrous today in Europe than in the past, the conversation around migration is turning to one of examining imbalances and finding solidarity with the sending regions affected by population decline due to migration.

Both the economic system and popular sentiment generally expect population growth to continue to occur, as it is a fixture in the psyche of modern society. This fixture has been influenced by the human experience especially over the last four decades of the 20th century during which, indeed, the vast majority of countries in the world experienced rapid population growth. While a reckoning with the end of this larger 300-year-long trend is coming this century, Western Europe has at least temporarily avoided confronting this change through in-migration from its neighbors as well as from other continents. This leaves other regions, such as the Balkans, as covered in this report, to be among the first group of countries (together with others in East Asia) to deal with modern "voluntary" depopulation.

Simply taking a country's current population size as the norm is rather arbitrary, and unending population growth is, by definition, unsustainable. So, at some point, the slowing or ending of population growth is natural and to be expected (Lutz, Sanderson, and Scherbov, 2001). Still, there are multiple challenges associated with population decline, within certain bounds, given the causes behind it.

In this report we will address this issue from a multi-dimensional demographic perspective, which means that we will not only look at population size and age structure, but also differentiate by level of education and labor force participation. We expect smaller but higher-skilled societies across Europe, and as human resources grow more specialized and valuable there will be even more consequential competition for workers.

**If Western European countries that target the Balkans for migration do not pay greater attention to the impacts on the countries of origin, instead of being primarily driven by their own domestic labor market shortages, they risk undermining the long-term economic and social development of the Balkan region.**

In the following sections, the importance of human capital in the context of population decline and associated greater rates of aging will be discussed.

# 2 The Final Phase of the Demographic Transition

Demographic transition is the progression of demographic regimes, from the high birth and death rates of the pre-industrial era, to a middle-stage when death rates decline and spark rapid population growth until, finally, birth rates correspondingly decline and population growth moderates or ends. This transition, which earlier was also labelled as the "demographic revolution," has been characterized as the transition from uncontrolled high levels of birth and death rates to a modern system of controlled and low levels of these rates (in the context of fertility, "controlled" refers essentially to the reproductive behavior of individuals/couples, while in the context of mortality it also has a strong public health component). Intermediate stages of the demographic transition – when death rates have already fallen while birth rates remain high – are associated with rapid natural population growth, where "natural" refers to the balance of births and deaths not considering out-migration, which in open populations is a third factor impacting population change.

While in the process of demographic transition, declines in mortality are almost always an object of universal aspiration but high fertility norms are often deeply rooted within cultures and typically take longer to correspondingly adjust to any improvements in mortality. Only after (i) birth rates fall below the so-called "replacement level" of two surviving children per woman and (ii) a period of time passes when a young age structure results in an increase of women entering reproductive age (with a slowing of growth momentum over time) does population growth then eventually come to a halt. The precise timing of this process varies from one population to another also depending on trends in mortality.

While in a few cases, such as historical France, the mortality and fertility declines happened only gradually and at about the same time, in most countries there was a distinct lag time of several decades between the two. In terms of what is generally agreed upon, the framework of the three basic preconditions for a lasting fertility decline is widely accepted (Coale, 1973):

1. Fertility must be within the calculus of conscious choice (at the level of women or couples), meaning it must move from the realm of fatalism to that of consciously planned behavior;
2. Lower fertility must be advantageous; and
3. There must be culturally acceptable means for preventing births.

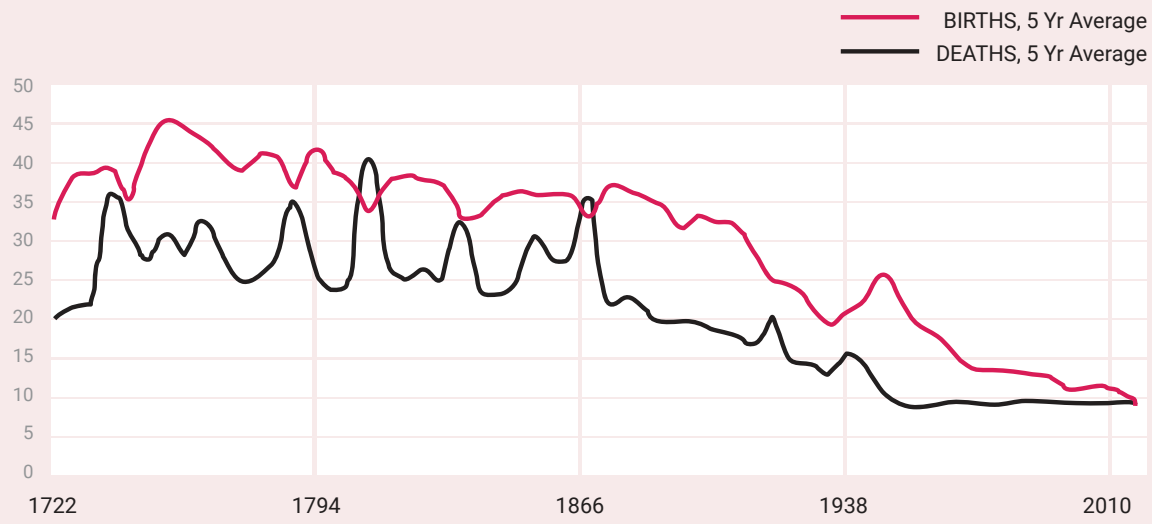
This framework effectively presents the idea that there is no single causation of fertility decline. Rather, the cognitive (education-related), economic (also urbanization-related), and contraception-related factors all need to come together. These pre-conditions were required in historical Europe to precipitate fertility decline in the same way as they are still required in today's African countries seeking to moderate fertility and speed their process of demographic transition, and economic development.

Mortality rates have shown continuous improvements for the most part, but there have also been some notable discontinuities, such as the AIDS pandemic leading to significant falls in life expectancy in some African countries, or the deterioration of mortality conditions mostly among low educated men in some parts of the former Soviet Union. But in its generalized form, the process of the demographic transition is considered to be universal in modern history, and essentially irreversible.

At the moment various populations around the world are at very different stages of this universal process of demographic transition. While the process was completed in Europe decades ago, it is now also complete in most countries in Asia and the Americas, but still underway in large parts of Africa, where most countries are still in the phase associated with rapid population growth.

**The striking contrast in demographic patterns currently observed in various parts of the world are essentially a consequence of different populations being at different stages of this universal process.**

The concept of demographic transition was originally triggered by the observation of declining birth rates in many European countries over the first few decades of the 20th century. Demographers Warren Thompson (1929), Adolphe Landry (1934), and Frank Notestein




**▲ Figure 1.**
**The Demographic Transition in Finland, with five-yearly averages of birth and death rates per 1000 people from 1722-2017 in Finland**

(Lutz, 1987; and the public statics agency "Statistics Finland" for more recent years).

(1945) were the first to classify countries into different stages of this universal process that brings countries from a condition of high birth and death rates to one that is ultimately characterized by low birth and death rates. In this early literature, the driver of this process was simply called "modernization" without a deeper specification in terms of the relevant causal mechanisms propelling these changes. But what they likely had in mind was general socioeconomic development as the reason for a decline in crude death rates ("CDR") that was typically followed by a decline in crude birth rates ("CBR") after a time-lag of varying length. As a consequence of the difference between the two, the rate of natural increase ("RNI") of a population would rise for a period of time. Disregarding in- and out-migration, this difference is the reason for population growth in all populations around the world.

Figure 1 illustrates this process for Finland, which has the world's longest national-level demographic time series with annual data on death and birth rates since 1722. After strong fluctuations through the middle of the 19th century, the 1870s saw a lasting decline in death rates begin. By comparison, the birth rates in Finland only started a steeper decline around 1920. During this 50-year period, or the lag period, the population grew at around 1.3%-1.4% per year.

While initially just a description of the demographic experience in today's low fertility countries, the concept of the demographic transition has been further refined over the past few decades. The demographic transition has essentially become the basis for all international population projections, which uniformly assume that once the process of mortality decline has started, fertility decline will follow until a level around or below a replacement level is reached. The predictive power of the demographic transition justifies its characterization as a "theory" in the spirit of critical rationalism (Popper, 1959), although it has been criticized that the theory is still not specific enough in terms of which precise conditions mortality and fertility declines occur in, and what impacts the speed of decline.

A core component of demographic transition theory is also the prediction of its irreversibility, a hypothesis that has not yet been falsified by any population. Quite to the contrary, with respect to fertility there are examples of countries that after having gone through the fertility transition have fallen back into poverty, such as the Republic of Moldova after the dissolution of the Soviet Union (which became the poorest country in Europe with a GDP per person adjusted for purchasing power parity lower than countries such as Angola and Nigeria). Yet the fertility rate in Moldova has further declined to a level of 1.6 children per woman, as opposed to 5-6 in early demographic transition countries in Africa. In spite of a minor recovery, Moldova's birth rate is unlikely to go back to pre-transition levels.

Changing marriage patterns and in particular the rise of non-marital unions together with value changes concerning sexuality and post-modern values in general have also been labeled a "Second Demographic Transition" by scholars Lesthaeghe and Van de Kaa (Lesthaeghe, 2010; Van de Kaa, 1987), because they saw view these social changes as the reason for a second wave of fertility decline that has brought fertility to below replacement levels.

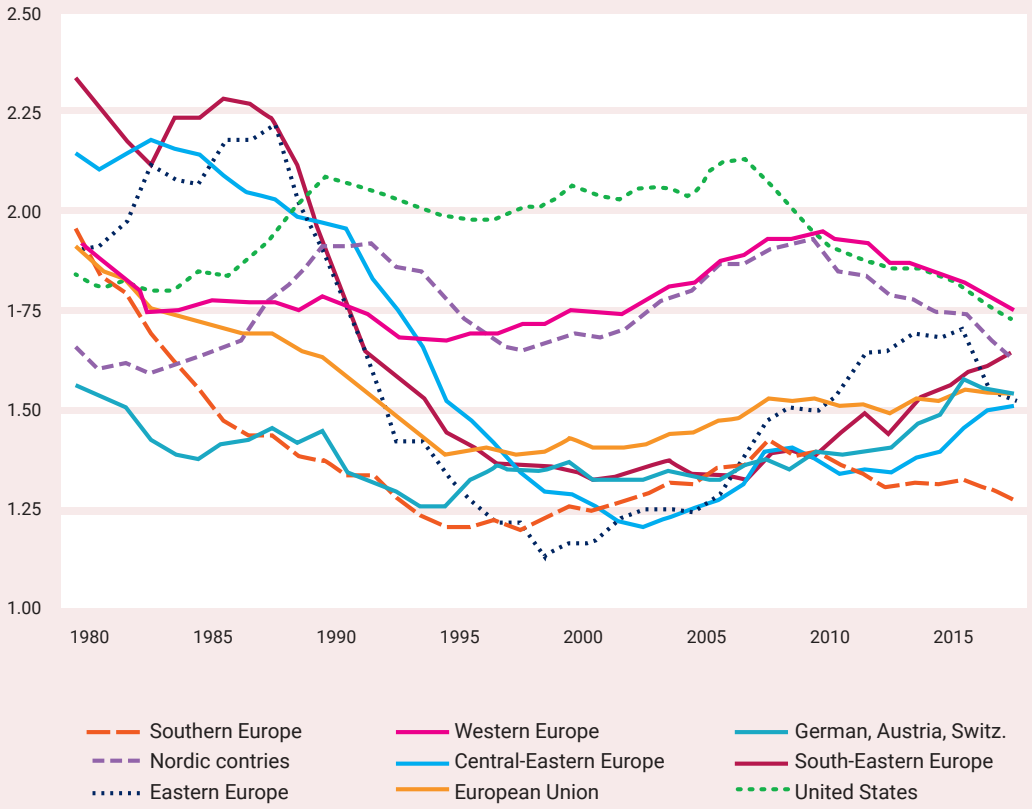



**Figure 2.** ▲
**Trends in Total Fertility Rate ("TFR") in different parts of Europe and the U.S. since 1980**

*(VID and IIASA, 2020).*

## Uncharted Territory: Fertility and Mortality after the Demographic Transition

**There is no widely shared, consistent theoretical framework for understanding how fertility and mortality levels develop once the demographic transition is completed.**

The intuition of many demographers and other analysts in terms of thinking about future fertility levels has been strongly influenced by the numerical values provided by the series of the widely used world population projections regularly produced by the UN Population Division since the 1960s. These projections reflected the dominant thinking at the time – that increases in life expectancy would level off with the survival curve becoming more and more rectangular but not shifting to the right and the fertility of all countries would converge to a "Total Fertility Rate" (or, "TFR") of 2.1, the so-called replacement level of fertility, reflecting a new long-term equilibrium that would be reached. These assumptions, together with the assumption of a future of little to no international migration, resulted in a demographic outlook where in the long run, after having gone through the turmoil of demographic transition, every population would be in a stable equilibrium with no countries shrinking or increasing. In the absence of any convincing alternative narrative about the future, this set of assumptions made sense and were also politically convenient in the context of the United Nations ("UN") because no government needed to be afraid of a future in which their population would either shrink or grow indefinitely.

However, in recent decades all three assumptions that lead to this predicted stability proved to be wrong. Life expectancy in an increasing number of countries surpassed the previously assumed upper limits (Oeppen and Vaupel, 2002), while migration has continued and even increased over time in some regions. Additionally, fertility rates – which are the most influential drivers of long-term demographic trends – continued to fall below replacement level in almost every country that has reached that threshold. As discussed in Section VI, the replacement level of 2.1 is a theoretical construction, so it is unsurprising it has no analogue in the real trends of any

country, which do not miraculously stop their decline once reaching replacement level of 2.1, or other. As a consequence, most international population projections now assume a convergence of fertility levels at a lower level, such as a TFR of around 1.85 according to projections by the UN and the Wittgenstein Centre for Demography and Global Human Capital (the "Wittgenstein Centre"), a research institution focused on such topics (United Nations 2019; WIC 2019). A set of new global population projections published in July 2020 by the Institute for Health Metrics and Evaluation assumes that ultimate fertility levels will be much lower, settling around 1.3 in most countries by the end of the century (Vollset et al., 2020). But such alternative numbers for a long-term post-transition fertility level are as arbitrary as the choice of 2.1 because there is simply no theoretical or empirical basis for choosing an ultimate fertility level moving forward.

An influential article in 2009, however, showed that for a certain time interval the TFR had a positive correlation with the Human Development Index ("HDI"), after reaching a minimum level (Myrskylä et al., 2009). This was taken as an indication that fertility would not stay at very low levels, but instead recover to some extent as social and economic development progressed. But the experience over the last decade contradicts that assumption. South Korea, which showed the most rapid progress in socio-economic development, had further declining TFRs, which in 2018 reached the lowest national level of any country at 0.98 children per woman and in 2019 even further decreased to 0.92 children per woman. Some of the highly developed countries in Northern Europe that also used to have relatively high fertility, such as Finland and Norway, saw steep TFR declines over the past few years.

**Figure 2** summarizes the most recent fertility trends in different parts of Europe and the United States. It clearly indicates a departure from the patterns of the early 2000s, when there seemed to be rather stable patterns of high fertility around 1.85 in Northern Europe and the US, and low fertility around 1.3-1.4 in the rest of Europe. There now appears to be some convergence in TFRs across this region to a level of around 1.5. This picture certainly does not confirm the view of a convergence around the higher rate of 1.85, which had been seen in the U.S. and Northern European countries.

Given all these uncertainties and national differences in fertility levels, what then do we know about the likely long-term fertility levels at the end of demographic transition? A major effort to summarize the state of our knowledge about the drivers of low fertility and future trends involving hundreds of population experts from around the world is reported in the work of Basten et al. (Basten et al., 2014). It includes a detailed assessment of different arguments concerning the determinants of fertility in such dissimilar domains as biomedicine and contraception, cultural and social forces shaping fertility ideas, norms and desires, changes in partnership and living arrangements, employment and the economy, education and finally the possible role of policies trying to directly or indirectly influence fertility. This last factor will be discussed in more detail in Section VI. The conclusions from this most comprehensive assessment was that fertility trends will likely continue to be context-dependent, implying that global convergence to any particular level is unlikely, but if such a level needs to be assumed for the purpose of producing population projections, it should be well below 2.1. For projections, an alternative to assuming one convergence level is to produce alternative scenarios reflecting plausible ranges of possible future trends and comparing the outcomes in terms of future population sizes. This approach will be taken for the projections presented in the next section, combining different fertility scenarios with different scenarios on future migration levels, which are even harder to forecast than fertility because of their greater volatility.

At this point it is also appropriate to say a word about the possible impact of the COVID-19 crises on future mortality and fertility trends. Several recent studies have modelled how COVID-19 mortality could impact life expectancy as a function of the prevalence of the disease in the population, and the age structures of the populations at risk, since the virus affects older age-groups much more severely than younger ages (Marois, Muttarak, and Scherbov, 2020). Generally, the results show that for the year 2020, in countries with a COVID-19 prevalence below 1%, there will be hardly any visible effect on life expectancy. In the hardest hit regions of Europe, however, there could be short-term decline of some 3-4 years of life expectancy on average, if no harvesting effect is assumed (i.e. if the people dying of COVID-19 would not have died anyhow from other causes over the course of the same year). To what degree there is such a harvesting effect can only be assessed retrospectively, 2-3 years in the future when we will have more detailed information.

If there are no serious lasting health problems among those surviving a COVID-19 infection, then over the coming years the trend in life expectancy should revert back to its earlier tendency to increase, rather than decrease. One can even speculate that in highly developed countries the possible consequences of strong efforts to improve health systems and vaccination rates during the COVID-19 crisis could even reinforce the likely future increases in life expectancy, contributing to longer term continued health outcomes. On the other hand, economic depression together with high unemployment could have serious psycho-social consequences that contribute to higher mortality, depending on the length and severity of the crisis. With respect to fertility, the impacts are even more speculative. There may be two competing forces: one leading to higher fertility due to strengthening family bonds and more time spent together at home, and the other leading to lower fertility as a consequence of economic uncertainty and fears about the future. To see which of the effects dominates, we will have to be patient for at least nine months after the beginning of the lockdown efforts and review available data at that point in time.

There may be other lasting effects of COVID-19 on the social and economic development of Serbia in particular, and other countries in the region, particularly in the field of migration and possibly on the education system, both relevant for an assessment of future human capital. Greater emphasis by countries on epidemiological safety and economic recovery is likely to keep international travel and labor migration at lower levels, at least in the short-term. Initial political responses continue to evolve, but some have reflected a view that the COVID-19 outbreak and secondary effects will force a larger reassessment of how interconnected states remain, including migration regimes and the Schengen area in Europe. Although it is too early now to make definitive statements about such potential impacts, we will address some of these questions in the following sections.

# 3 Migration, Aging, and National Population Dynamics

Migration is the third factor of population change in addition to fertility and mortality. Regardless of a birth deficit (i.e. more deaths than births) populations can either grow or reduce in size depending on migration rates. In Germany for example, the resident population has continued to expand in spite of natural conditions for it to reduce in number; this has been due to migration, with Germany prominently taking migrants from other EU member states. It is hence interesting to disentangle the effects of natural population growth and of migration on future population size.

Table 2 presents population comparisons and projections (both accounting for migration, and excluding migration) for all European countries as well as a number of East Asian countries which are also expected to shrink based on recent scenario projections by European Commission ("EC") and the International Association for Applied Systems Analysis ("IIASA") (Lutz et al., 2018) (with Serbia and other neighboring Balkan countries highlighted in blue for effect). These results are derived from multi-dimensional demographic modelling techniques that take into account age, sex, education, and other characteristics, building on approaches used by the Centre of Expertise on Population and Migration (CEPAM), a joint research initiative of the EC's Joint Research Centre (JRC) and IIASA.

A comparison of the "medium assumption" scenario and the "medium assumption – zero migration" scenario (combined with medium fertility and mortality) shows that under the hypothetical assumption of no international migration, 23 of the current 27 member states of the European Union would have a lower population size in 2075 than today.

**Table 2.**
**Population size across countries (in the millions) (i) as of 2015, projections for countries' populations in both (ii) 2045 and (iii) 2075, according to a "medium assumptions" scenario ("SSP2"), and projections for countries' populations in both (iv) 2045 and (v) 2075, assuming no inbound or outbound migration, with a focus on countries of East Asia and Europe, with Serbia and neighboring Balkan countries highlighted in blue**

(WIC, 2019).
Projections for Serbia were updated by Michaela Potančoková.

| | 2015 | 2045 (Medium) | 2075 (Medium) | 2045 (Medium – zero migration) | 2075 (Medium – zero migration) |
|---|---|---|---|---|---|
| China | 1,397.1 | 1,341.5 | 1,040.7 | 1,348.0 | 1,053.1 |
| Japan | 128.0 | 110.3 | 89.8 | 108.6 | 85.3 |
| South Korea | 50.6 | 49.8 | 39.8 | 49.5 | 38.8 |
| Thailand | 68.7 | 67.4 | 56.0 | 65.5 | 50.9 |
| Vietnam | 93.6 | 106.5 | 95.8 | 109.3 | 101.8 |
| Albania | 2.9 | 2.3 | 1.5 | 3.0 | 2.6 |
| Austria | 8.7 | 9.2 | 9.7 | 8.2 | 6.9 |
| Belarus | 9.5 | 8.6 | 8.0 | 8.4 | 7.1 |
| Belgium | 11.3 | 12.4 | 13.3 | 11.4 | 10.7 |
| Bosnia-Herzegovina | 3.5 | 2.3 | 1.2 | 3.2 | 2.6 |
| Bulgaria | 7.2 | 5.3 | 3.7 | 5.9 | 4.8 |

| | 2015 | 2045 (Medium) | 2075 (Medium) | 2045 (Medium – zero migration) | 2075 (Medium – zero migration) |
|---|---|---|---|---|---|
| Croatia | 4.2 | 3.7 | 3.2 | 3.7 | 3.2 |
| Czechia | 10.6 | 10.0 | 9.2 | 9.7 | 8.4 |
| Denmark | 5.7 | 6.2 | 6.8 | 5.8 | 5.8 |
| Estonia | 1.3 | 1.2 | 1.2 | 1.2 | 1.0 |
| Finland | 5.5 | 5.6 | 5.8 | 5.5 | 5.5 |
| France | 64.5 | 72.8 | 80.0 | 68.3 | 68.5 |
| Germany | 81.7 | 80.5 | 80.4 | 72.7 | 60.5 |
| Greece | 11.2 | 11.0 | 10.6 | 10.3 | 8.6 |
| Hungary | 9.8 | 8.6 | 7.5 | 8.3 | 6.8 |
| Iceland | 0.33 | 0.39 | 0.42 | 0.39 | 0.41 |
| Ireland | 4.7 | 5.5 | 5.8 | 5.4 | 5.5 |
| Italy | 59.5 | 56.1 | 50.9 | 53.3 | 43.4 |
| Latvia | 2.0 | 1.7 | 1.6 | 1.7 | 1.4 |
| Lithuania | 2.9 | 2.4 | 1.9 | 2.6 | 2.2 |
| Luxembourg | 0.57 | 0.77 | 0.97 | 0.6 | 0.56 |
| Montenegro | 0.63 | 0.6 | 0.55 | 0.62 | 0.56 |
| Netherlands | 16.9 | 18.2 | 18.8 | 17.1 | 16.1 |
| North Macedonia | 2.1 | 1.8 | 1.4 | 2.0 | 1.8 |
| Norway | 5.2 | 6.2 | 7.2 | 5.7 | 5.8 |
| Poland | 38.3 | 34.5 | 28.8 | 35.5 | 30.7 |
| Portugal | 10.4 | 9.1 | 7.7 | 9.4 | 7.8 |
| Moldova | 4.1 | 3.6 | 2.9 | 3.7 | 3.0 |
| Romania | 19.9 | 15.4 | 10.5 | 17.3 | 14.0 |
| Russia | 143.9 | 134.2 | 129.4 | 126.0 | 108.3 |
| Serbia (without Kosovo[4]) | 6.9 | 5.6 | 4.4 | 6.0 | 5.1 |
| Slovakia | 5.4 | 5.0 | 4.3 | 5.1 | 4.5 |
| Slovenia | 2.1 | 2.1 | 2.1 | 1.9 | 1.6 |
| Spain | 46.4 | 4.8 | 46.9 | 43.5 | 35.9 |
| Sweden | 9.8 | 11.4 | 13.4 | 10.3 | 10.6 |
| Switzerland | 8.3 | 9.8 | 11.0 | 8.4 | 7.5 |
| Ukraine | 44.7 | 38.4 | 34.1 | 37.3 | 30.4 |
| United Kingdom | 65.4 | 73.3 | 80.0 | 69.2 | 69.0 |

4 References to Kosovo shall be understood to be in the context of Security Council resolution 1244 (1999).

This population decline results from the complex interactions of current age structures (resulting from past fertility, mortality, and migration trends), assumed further increases in life expectancy (contributing positively to population growth) and assumed fertility levels not so different from currently observed ones (contributing to long-term population decline). In the EU, only France, Ireland, Sweden, and Finland would experience modest population growth by 2075 under the scenario of no international migration. This is mostly due to a relatively higher level of current fertility, together with a somewhat younger current age structure.

The broader pattern for European countries not in the EU is rather similar as those in the EU. All countries listed in Table 2 would be naturally shrinking without considering in- and out-migration, except for Iceland, Norway, and the UK. Many countries also would shrink under the assumption of a continuation of past in- and out-migration rates, which is the migration assumption in the "medium assumptions" scenario. For Serbia's Balkan peers (highlighted in blue in Table 2), the gaps between the "medium assumptions" and "medium assumptions – zero migration" scenarios show how large the impact of out-migration becomes over time. Furthermore, unlike other major demographic events like births and deaths, out-migration is difficult to capture since emigrants often do not register when leaving the country. These population projections use official estimates, but they are in turn susceptible to under-reporting, particularly relevant for the high out-migration countries like those across the Balkans.

**Serbia can expect a smaller, but better educated future population according to all the divergent scenarios explored in this study, in keeping with the broad direction of the other countries across Europe.**

However, depending on how and whether out-migration from Serbia to Western Europe reduces or accelerates over the coming years, the severity of Serbia's population reduction could vary substantially. By 2050, this would mean a nearly 1,000,000 person difference between the high vs. low out-migration scenarios that assume a doubling of recent migration streams or, alternatively, zero future migration (calculated as extreme cases for sensitivity analysis) with otherwise equal assumptions on future fertility and mortality trajectories.

In the "medium assumptions" scenario, in- and out-migration rates are assumed to be constant at the levels observed over the past decades, but when the population base to which these constant rates are applied diminishes over time, this has a compounding effect and also results in declining absolute numbers of emigrants. This constant migration rate assumption is combined with relatively constant future fertility at 1.6 children per woman in Serbia, and slowly improving mortality conditions, similar to conditions in other European countries. Under this "medium assumptions" scenario the population of Serbia reaches 5.35M by 2050, or 28% less than the population today in 2020. This middle-of-the-road "medium assumptions" scenario future falls between the "zero migration" scenario (resulting in a projected 5.87M in population by 2050) and the "double migration rates" scenario (resulting in a projected 4.89M in population by 2050).

## Population Aging Ahead

In all cases modeled, the proportion of the population above age 65 in Serbia will be higher than today, growing from about 22% in 2020 to nearly 33% by 2050 in the "medium assumptions" scenario. These aging trends are largely set.

**In the purely theoretical case where (i) fertility would immediately increase by 50 percent – which would bring it closer to current desired family size (Živković et al., 2017) – and (ii) there would be no (zero) migration, the rate of population aging could be slowed by more than half.**

The increasing average age would only reach 24% of the population being above the age of 65 by 2050, mostly due to the change in birth rate (Lutz et al., 2019).

As described above, population aging in Serbia to some degree is inevitable regardless of the fertility or migration scenario, and is a product not only of past low fertility and high out-migration, as reflected in the current age structure of the country, but also successes in extending longevity. According to UN data, life expectancy at birth (for both sexes together) in Serbia has increased from 66.7 years in 1956-70 to 75.8 years in 2015-20, thus increasing life expectancy in the country by over 9 extra years of life in the last five decades (UN, 2019). But population aging does not necessarily mean a growth in dependency if social policies like retirement are flexible and incentivize labor force participation, even in older years. Serbia's educational attainment, a proxy for the skills and adaptability of a population, is expected to grow, with the proportion of people holding post-secondary training or university degrees rising from 21% in 2015 to nearly 33% by 2050 if trends continue.

Actually, this improvement in the educational attainment of the adult population is a near certainty: in Serbia – like in almost every other country – the younger cohorts are better educated than the older ones. As those better educated cohorts move up the age pyramids and the older, less-educated pass away (a process called demographic metabolism) the average education of the population improves, even if there would be some stagnation in the expansion of schooling and a country's education strategy. For example, if the COVID-19 crisis would cause a serious interruption of the schooling system and that would lead to lower learning outcomes over 1-2 years, this new trend – if it cannot be compensated for while children are still of school age – would only translate into a slower increase (rather than a stagnation or a decrease) in human capital for the working age population, as it would slow but not overcome or reverse the broader momentum of educational attainment in Serbia.

A recent analysis in the trends of mean years of schooling ("*MYS*") and skills-adjusted mean years of schooling ("*SAMYS*") of the working age population for all countries in the world showed a rather favorable trend over the past few decades: while in 1990 the Serbian working age population had on average 9.91 years of schooling, this increased to 11.16 years in 2000 and 12.06 years in 2015 (Reiter et al., 2020). Based on actually-tested skills, the SAMYS increased even more rapidly from 9.10 years in 1990 to 12.14 years in 2015. Hence, adults' skills today are even slightly above today's OECD average (by 0.1 years) and increased over the past 25 years by the equivalent of more than three years of schooling. Similarly, the UN's comprehensive index of various education measures shows a steady rise in Serbia's development (UNDP, 2020). Strategies for dealing with population aging and associated questions of economic dependency (which underscore the importance of human capital) are further covered in the next sections.

# Human Capital and Labor Force Participation

4

Population aging and decline bring a set of clear macro-economic challenges. These relate most immediately to the balance of contributions and payments and the solvency of pension funds, health services, and other social policy programs. Such national programs tend to differ substantially from one country to another and a proper assessment of the resilience of the systems to specific demographic changes requires a detailed model for each specific system, which is typically only done within national social security administrations. For this reason, comparative international assessments of the economic burden of demographic changes tend to refer to more general ratios describing the relative sizes of segments of the population that contribute to the system and those that benefit from the system. These ratios are usually called "demographic dependency ratios" and exist in several forms.

Conventionally, these demographic dependency ratios simply involve the rather crude assumption that an individual's contribution is entirely based on their age, i.e. that adults contribute up to age 65 and thereafter everybody is considered a dependent. However, multiple factors including the changing nature of aging itself require an update as to how demographic change is considered. This has very real implications for whether ageing is seen as having serious economic consequences, or not.

**Use of chronological age to reflect economic dependency does not do justice to the present-day reality where "age 70 is the new 60" – health and education levels among older persons have vastly increased, extending the older population's productivity far beyond levels in the past.**

Often overlooked is the fact that even when older persons require care, delivery of such care is an economic activity, and contributes to the national economy in and of itself.

The simple *age dependency ratio* (the green line seen in Figure 3) is still frequently used, but in many cases paints a misleading picture. The projections on page 19 for five countries in and around the Balkan region illustrate this point. The results come from a micro-simulation model recently published for all EU member states (Marois, Bélanger, and Lutz, 2020). These calculations do not include Serbia but five other countries in the region and thus allow for some comparison against countries that share similar context with Serbia. As can be clearly seen, the age dependency ratio is expected to climb in all of these countries, underpinning popular narratives and reporting of upcoming economic doom.For some of these countries, the age dependency ratio even increases to twice its current level by 2060. But these dramatic results obscure important nuances and hide an otherwise uplifting story.

Viewed over the past decades, not only are lifespans longer, but we are living more years in good health (rather than just living). This reality together with the changing role of women in society and the labor market is among other factors also reflected in labor participation rates, making the simple use of age as the sole indicator of productivity, harder to defend. As shown by the *labor force dependency ratio* (the red line in Figure 3), when taking into account actual labor participation rather than using the crude assumption that participation and productive life ends at 65 and everybody below age 65 participates in the labor market at the same rates, a large portion of the feared-increase in dependency never happens. This is due to improving participation rates among the general population and particularly women, but also due to those at older ages.

It is not only for the reason of economic sustainability that labor participation should be encouraged even among older populations however, as studies show that well-being and connection with community are key benefits that people get from continuing to work in their later years. The precise definition of labor force participation differs by survey, in particular with respect to participation in informal work, which might have implications for pension systems depending on how they are structured. The European Labor Force ("*ELF*") Surveys used for the projections in this section define workers broadly, considering everybody as part of the labor force who is either working for pay, self-employed, or looking for work. This however still does not include other types of work, for example, as many women perform work as mothers and caregivers, which is surely of great value to society and allow families to save on the cost of otherwise outsourcing some of these tasks.

With reference to the possible impacts of the current COVID-19 crisis, a lot depends on whether people still in the working ages will suffer lasting health consequences that will make them less productive. While it seems clear that in terms of mortality the highest age groups and people with already multiple health problems are most seriously affected by COVID-19, which would actually lower the dependency in the future due to the so-called harvesting effect, the degree to which working age people will be hampered in their productivity by the pandemic is not yet clear.

The *productivity-weighted dependency ratio* (the blue line in **Figure 3**) adds another layer of consideration to demographic dependency ratios. This ratio accounts for the fact that not all individuals are equally productive in society. This ratio uses the educational composition of the population as a proxy for productivity (measured by different wage levels for different educational attainment groups) and shows how trends suggest that there will be more economic output produced per worker, given the improving levels of completed education.

While this effect may be diminished as the highest levels of education become less selective and pursued by a larger proportion of the population, making it less of a sorting mechanism at the higher end of the spectrum, education is importantly linked to adaptability, among other skills. Such skills are ever-valuable in the context of the changing nature of work (particularly with the onset of more remote work brought about by COVID-19), and the uncertainties that further automation and artificial intelligence might bring.

Lastly, the *productivity-weighted dependency ratio - Swedish scenario* (the dashed blue line in **Figure 3**) explores what demographic dependency would look like if these countries slowly converged with the highest participation rates for men and women that are seen in the European Union; those observed in Sweden today.

**In most cases, such improvements in labor participation would in fact mean a future reduction in dependency compared to today, the opposite of the prevailing expectations that an aging population will bring an overpowering drain on the economy over time.**

Even if these Swedish-like levels are not reached, the purpose of this scenario is to illustrate the power of incentivizing labor participation as a strategy for avoiding aging-related economic declines. Successes in both labor participation and education, two critical factors for describing any population, imply that the feared rise in dependency from population aging is largely overstated.

The examples of these five countries in **Figure 3** clearly show that the possible future economic burden of population aging that tends to come along with population decline very much depends on the perspective and the indicators taken. Whereas the conventional (and even old-school) age dependency ratio assumes that everybody above age 65 is a burden and shows very strong increases over the next four decades by over 80% in Croatia and Slovenia and over 60% in the other countries, the other more meaningful and nuanced indicators show much less of an increase of the economic burden of an aging population. Already considering the actual labor force participation rates in each country reduces the increase in the burden of nonworker to workers to around 20% in Hungary and Romania and around 30% in Bulgaria and Croatia (using the *labor force dependency ratio*). The outlook improves further when considering the fact that highly skilled people are on average more productive combined with the reality that the future labor force will be better educated than today (using the *productivity-weighted dependency ratio*). Additionally, if it is imagined that women in the countries covered in **Figure 3** gradually start participating in the labor market to the same degree that Swedish women do today, and pension ages also approach those in Sweden today (the *productivity-weighted dependency ratio – Swedish scenario*), then the demographic burden of dependency would actually decline by about 20% in all countries except for Slovenia, where it would stay about constant.

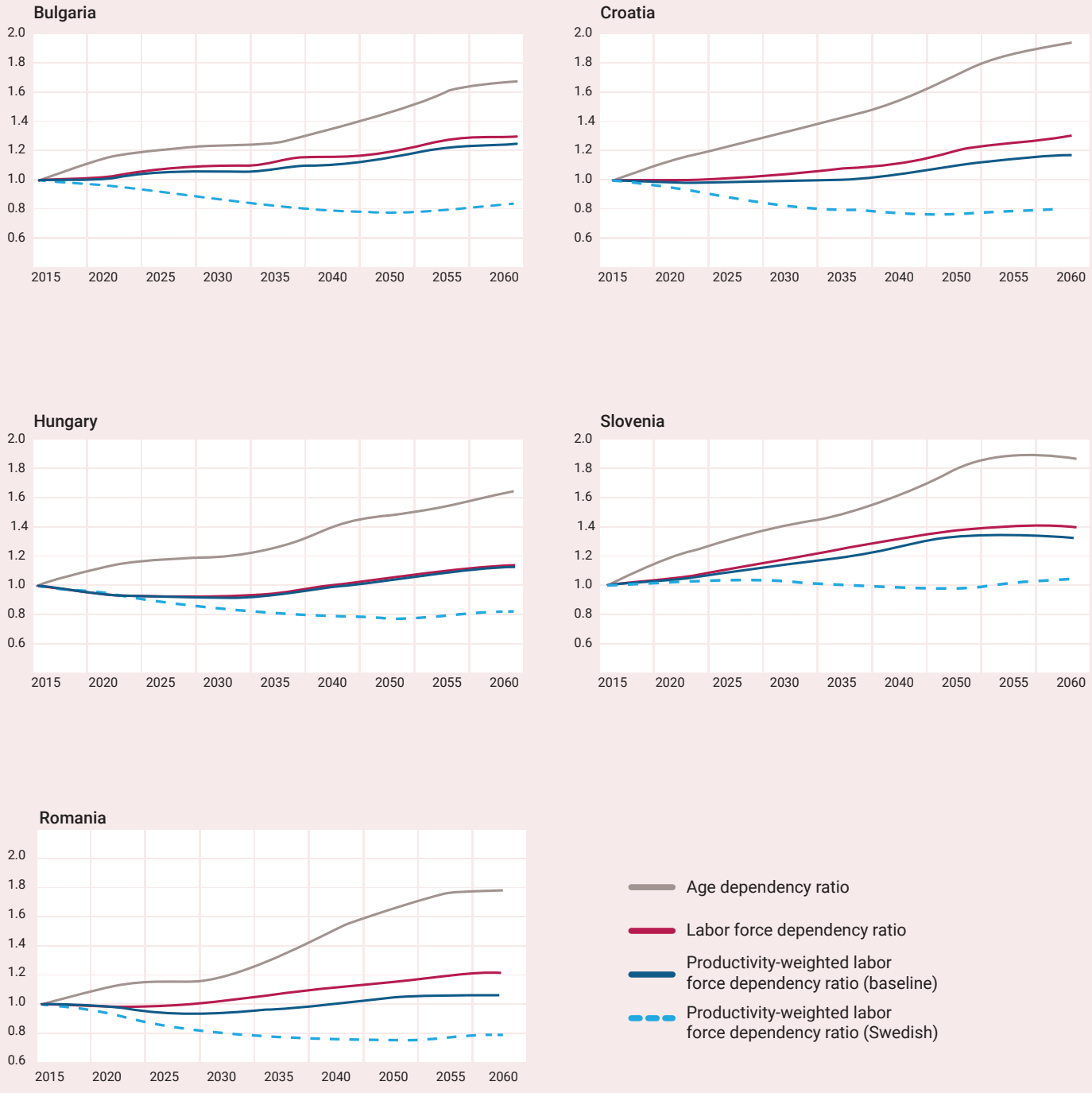



**Figure 3.**
**Projected trends in different demographic dependency ratios (shown relative to their levels in 2015) addressing the economic burden on population ageing for selected countries in the region, 2015-2060**

(Marois, Bélanger, and Lutz, 2020).

# 5 Serbia Amid High Out-Migration

Depopulation in Serbia comes from a specific mix of trends now common across Eastern Europe.

**Many countries in the region have the low fertility rates typical of highly industrial countries, paired with the high out-migration often seen in lower-middle income countries.**

This combination has made Serbia one of the fastest depopulating countries in the world. In earlier times, such as during World War I, Serbia suffered immense casualties – by many estimates Serbs had the highest proportional losses of the war with about 16% of the population or 1.25M dead (Keegan, 1998; Radivojevic and Penev, 2014). The historical depopulation was different from today not only because it was the result of conflict, but also because at the time the Serb population could at least "rebound" in some sense given the country's high fertility rates. By contrast, Serbia had only 1.49 children per woman in 2018. If Serbia's 21st century depopulation trend is to be moderated, then it will be critical to guarantee practical and reliable policy support for families as well as reduce the deeply felt economic and cultural push-factors contributing to high rates of out-migration.

Definitive statistics on out-migration, and by extension net migration, are difficult to come by for the whole of the Balkan region. A recent investigation into the data (which labeled the task a "statistical nightmare,") found that approximately 60,000 people leave Serbia each year, with about 15,000 to 20,000 more leaving each year than returning (Judah, 2019). The OECD estimates more than 650,000 people, mostly young, have left Serbia in the last two decades (OECD 2020). While the scale of movement varies, observers and international organizations widely look to the future with expectations of continued high out-migration in Serbia. Figure 4 details population projections for the "medium assumption" scenario, in which current trends largely continue. As outlined in earlier sections, Serbia can expect a smaller, better educated population in the future.

Serbia's combination of an educated population and the country's close proximity to European economies wanting their labor make it difficult for the country to build up human capital. As measured by the World Economic Forum,[5] the ability of Serbia to retain its talent or prevent "brain drain" currently ranks among the worst of all countries, within and outside the region, placing Serbia 134 out of 137 countries included in the assessment. Peers in the region, like Croatia, Romania, and Bulgaria, fare similarly poorly as they continue to struggle with the same westward migration outflows, which in some cases have accelerated as a natural result of being integrated into the European single market while also being at clearly different levels of economic strength.. Many Eastern European countries have seen a spike in out-migration after their accession to the European Union, and out-migration remains higher in newly acceded countries than their levels before joining, but it is unclear at what new levels they might eventually stabilize.

These experiences give a sobering reason to put out-migration among the highest of priorities in discussions about EU membership and national planning efforts, as this type of out-migration acceleration would likely repeat itself in Serbia if Serbia gets closer to (and eventually attains) EU membership status. Surveys indicated that in the minds of Serbs, EU membership is now closely associated with the facilitation of individuals to move away (Regional Cooperation Council, 2018). The consequential nature of this issue calls on Serbian leadership to proactively reduce migration push-factor pressures before accession, yet still, most of the out-migration dynamics would inevitably be set by the western countries and the reality of the current single market policy framework. Even amid COVID-19, Balkan-focused migration policies in prominent destination countries like Germany have been publicly stated to be based on the interests of the German labor market (rather than the interests of Balkan countries' human capital development).

**In response, the European Union should provide convincing strategies for avoiding large unintended out-migrations as part of their ongoing outreach to the Western Balkans, as the talks often blur the distinction between a freedom to move and in-effect promotion of the outflows of people from these countries.**

5 For more information, see The World Economic Forum, "Executive opinion Survey, Appendix C," available at http://reports.weforum.org/global-competitiveness-index-2017-2018/competitiveness-rankings/#series=EOSQ399.

**Figure 4.**
**Serbia's population pyramids by age, sex and level of education in 2015 and 2060**

(WIC, 2019).

## Who is leaving, and why?

Data shows that in terms of human capital composition, out-migration in Serbia has been disproportionately concentrated among the high-skilled and low-skilled workers, as shown in **Figure 5** This pattern may be self-reinforcing because low and high-skilled workers have an economic complementarity that can be disturbed. The movement of highly educated people, in particular, the phenomenon known as "brain drain," is commonly discussed with hopes for these workers' return, or a "brain circulation", that brings the most educated and skilled people and their human capital back to their home country. This ideal remains rather theoretical, however, as most of the emigrants from Eastern Europe have stayed in their destination countries (Atoyan et al., 2016). Furthermore, the contemporary trends in emigrant skill composition that is seen in many Western Balkan countries stand in contrast to trends from earlier decades. During the 1970s there was a significant wave of about 1.3M Yugoslavs, many of them Serbs, who left as guest workers heading especially for Germany, Austria, and Switzerland (Bernard, 2012). These workers were used for relatively menial jobs in their destination countries. Today however, a significant proportion of Serbian emigrants carry with them more years of schooling, a product of overall educational attainment rising in the country, with migration becoming more education-selective within the population in Serbia. Furthermore, many of these emigrants are deciding not to return, in a break with past tendencies.

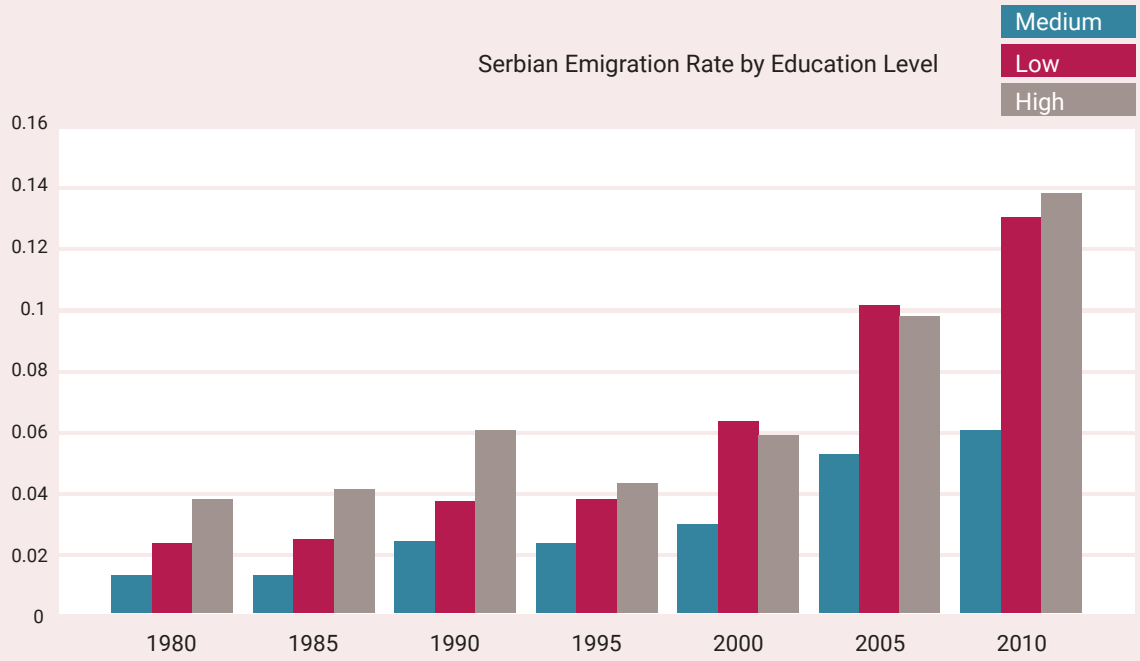
The reasons behind the outflows of migration in Serbia in current times are primarily economic, but also cultural to a degree. Surveys have found that when asked, roughly a quarter to a third of respondents express a desire to leave the country (Simić, 2018; Regional Cooperation Council, 2018). Students are even more likely to hold such sentiments, with as many as 60% indicating so in one public opinion survey on youth migration (Bjelotomic, 2018). Actual realized migration is naturally much lower, but these sentiments are in line with widespread unhappiness with the general economic, social, and political situation in the country. A study by the Government of Serbia (the "*government*" or "*GoS*") confirms this, finding that the main push-factors for Serbian students to leave are the inability to find a job in their field (27%), low incomes (21%), and low living standards (29%) (Government of Serbia, 2018). Objective material standards have increased for Serbs in recent decades, as in almost all countries, but what is considered to be normal is often more a question of relative wealth and expectations, meaning in the case of Serbia the relative wealth expectations are comparisons against its neighbors and Western European economies.

Besides the economic drivers, a common theme throughout Eastern Europe is the equivocation between going abroad and success. Serbia is no exception in this regard. "Staying here is what young people would call 'a loser's move'," said one Serbian social psychologist in a media report on the topic, a trend confirmed by a broad media review in which the author summarized popular thinking as, "get out of Serbia for a better life" (Simić, 2018; Brezjanović-Shogren, 2019). These blunt characterizations sum up an uninspired narrative of the future that has persisted in Serbian culture, and is accompanied by parental support for young peoples' decision to leave 90% of the time (Government of Serbia, 2018). Both migration and fertility decisions involve a calculation about the future and rely on a general optimism that is lacking not only in Serbia, but in many European societies today.

While Serbian emigrants can give concrete examples of migration push- and pull-factors at work, returnees offer insights into what attracts people to build lives at home in Serbia. Returnees, a self-selected group who have often achieved some financial success, cite as motivations to come back a feeling of belonging, family ties, day-to-day comforts, and even prospects for giving their children a better childhood in Serbia than where they had lived abroad (Brezjanović-Shogren, 2019). Interestingly, the perception of quality of life was found to change with experience in Western Europe and North America, as Serbian returnees seemingly changed from placing highest value on better pay and material success that compelled them to leave, to instead stressing intangible cultural factors that drew them to return home. This finding seems to support the idea that once basic economic security is met, many people would naturally prefer to pursue options other than out-migration if not otherwise feeling compelled to do so out of financial necessity.

## What's at stake?

In terms of impacts on the labor force, the food and hospitality, wood, and transportation sectors are some of those left understaffed that are in need of more workers in Serbia. For the higher-skilled workforce, a large number are composed of medical professionals and IT specialists. Serbia produces more health workers than the OECD-average, but the majority of current medical doctors are considering leaving and there is already a lack of necessary specialists in some health sectors (Institute for Public Health of Serbia, 2015). Serbia's youth-concentrated "brain drain," especially in the science, technology, and innovation sectors, results in a loss to the country of around 1.2B Euro each year (WFD and IDI, 2019). Looking at the broader Central and Eastern European ("*CEE*") region, the IMF found that emigration from 1995–2012 equated to cumulative real GDP losses of 7% on average for countries in the region, and in spite of remittances' effect on investment and consumption, emigration broadly reduced private sector activity, external competitiveness, and general productivity (Atoyan et al., 2016).




**Overall, these impacts underscore what is at stake when the education system – the primary skills-forming institution in society – does not adequately align itself with needs of the economy and people are left without fulfilling and experience-relevant channels to make a living.**

Such coordination is done to varying degrees across Europe, but it is those countries like Serbia with already high out-migration that can least afford the consequences of not highly coordinating and aligning the education sector to the job market. Any possible allocation of study spots or funding configurations for educational programs inherently require such calculations about the future.

It is too early to say what the consequences of the COVID-19 crisis may be on migration patterns in Serbia. There is preliminary information that around 400,000 Serbs living outside the country came back to Serbia in March 2020, just before borders were closed. If accurate, this would be a significant proportion of the Serbian diaspora returning home. But at this stage it is unclear whether these individuals will mostly return to their earlier workplaces outside Serbia or a sizeable proportion of them will stay home in Serbia for longer. In any case, this could be an opportunity for the government to produce incentives and make attractive offers for them to stay in Serbia rather than leave the country again. Government initiatives to support returnees could include a number of efforts focused on maintaining diaspora ties, hosting virtual job fairs and lowering administrative burdens of return. However, these efforts cannot substitute fixing the underlying causes driving people out of Serbia. To help solve the disconnect between years spent in education and the lack of available jobs that feed resentment and pessimism among youth particularly in Serbia, the Serbian government has among other initiatives started promoting dual education, which brings companies into the educational and training process, as well as forming sectoral skill councils focused on employment fields (Vasić, 2019). These actions are a healthy and necessary development, and if successful in streamlining the transition from student to worker, should be expanded throughout the vocational and university systems.

▲ **Figure 5.**
**Emigration Rates by Level of Education in Serbia**

(Brückner, Capuano, and Marfouk, 2013).

Simulations for Serbia and the European Union confirm that to deal with the future demographic changes of depopulation and aging, improving labor participation is key (Kupiszewski, Kupiszewska, and Nikitovic, 2012; Lutz et al., 2019). Automation and increased worker productivity offer additional strategies to thrive with a smaller labor force. To harness human capital and maximize returns, it is in the interest of Serbia to continue to further its efforts to consciously and flexibly manage its education system to be responsive to labor market needs, which works against the current skills mismatch and is a source of common frustration that could be mediated by providing viable paths for Serbs to find experience-relevant livelihoods and build fulfilling futures.

# 6 Pro-Natal Policies in Europe

As recently as the 1980s, Serbia had a birth rate at replacement level. By 2018, the birth rate stood around 1.49 children per woman, indicating a variety of economic and cultural changes that have since prioritized other pursuits. Low fertility levels have concerned national governments at least since the Franco-German conflict in the 1870s, as described in the historical section. Once fertility levels in several European cities and among specific ethnic sub-populations fell below the replacement level of two surviving children per woman in the 1920s and early 1930s, there was another wave of concern about the assumed negative consequences of low fertility. Shifting national power balances and economics drove the renewed focus on low fertility during and after this time period, with policies attempting to counteract the trend finding very different expressions in a variety of countries.

In Sweden the famous pro-natal population policies go back to Gunnar and Alva Myrdal's work in the 1930s, which pointed to the fertility-enhancing effect of a welfare state that incentivizes women to both participate in the workforce and also raise children, which at the time was a rather radical view. A more authoritarian approach was taken by Nazi Germany, which gave strong moral and material support to families with many children, with an explicit emphasis on the benefits this was providing for the German nation. After World War II, partly because of the excesses these policies were taken to in Germany, in most countries the special fertility-enhancing policies were no longer high on the policy agenda (except for France, where pro-natalism was in fact strengthened). In the aftermath of World War II these countries experienced the post-war baby boom, which in the U.S. and many European countries brought fertility rates up to three or more children per woman on average. This baby boom resulted from a combination of growth in early marriage (thus ending the previous "European marriage pattern" characterized by late marriage and high proportions of people never marrying) together with economic growth and widespread optimism about the future.

During the 1970s many European countries then experienced rather sharp declines in fertility rates. Because this decline coincided with the introduction and broad use of the hormonal contraceptive pill, this decline was even labelled the "*Pillenknick*" (meaning a bend in the birth rate resulting from the pill) in German-speaking countries. But the pill was only a more effective method of contraception than previous, and not the underlying reason for the decline fertility rates which instead resulted from social and normative changes as discussed in the section on demographic transitions. Already in 1978, an important book published by the Council of Europe, "Population Decline in Europe," described the social changes unfolding (Council of Europe, 1978).

An interesting quasi-natural experiment in pro-natal policy can be tested by the comparison of the two German states, east and west, split by the iron curtain. Up until around 1974, the two states shared the same steep decline in fertility rates until the East German government decided to implement strong countermeasures, whereas no new specific pro-natal policies were introduced in the West (Büttner and Lutz, 1990).

**East German fertility recovered sharply, whereas fertility continued to fall in West Germany. The East's effective policies explicitly removed a barrier to family life, which had been an acute housing shortage for young couples (and those looking to start families).**

Every woman got privileged government supported housing with the new reforms as soon as she was pregnant, even irrespective of her marital status. Together with generous financial support and childcare facilities, these policies helped to turn around the decline in fertility in East Germany. Interestingly, many female university students also decided to have at least one child early on, contrary to the general trend in industrialized societies, presumably in order to benefit from these support measures. As a heritage of this pattern, even after German unification, women in the Eastern part of Germany continued to have their children much earlier than in the West.

In more recent decades, an increasing number of governments have tried to raise fertility rates from below replacement fertility through various forms of family-related policies. This increase in attention at the level of national leadership is documented by regular surveys taken by the Population Division of the UN Department of Economic and Social Affairs. This data shows that the share of countries in the world stating that they have explicitly pro-natal policies has risen from 10% in 1976 to 15% in 2001, and up to 28% by 2015. Such policies range from direct pro-natalist campaigns to softer regulations that try to help people to balance work and

family life and have the number of children that they consider personally ideal. A key differentiating characteristic of policies across countries is whether they emphasize general financial assistance, mandated flexibility to take parental leave after childbirth, or the provision of childcare facilities. There is no clear evidence of cross-national convergence in such policies. Different mixes of these three policy instruments are rooted in welfare state histories as well as different attitudes towards families and the role that governments should play in influencing such personal decisions.

In terms of the scientific literature studying the effectiveness of pro-natal policies, there have been several attempts to summarize the experiences and the effects of such policies on the level of fertility in different countries. Among the mixed cases, not all of the implemented policies have achieved the intended changes in the conditions under which young women and men decide to start their families or extend them, and not all changes in these conditions actually resulted in changes in observed fertility rates. Gauthier concluded from a comprehensive survey of many such policies and their effects that the evidence of family policies on fertility trends is inconclusive (Gauthier, 2007).

Luci-Greulich and Thevenon studied the experience of 18 OECD member countries over the period from 1980 to 2007. Due to the fact that the early 2000s were a period of increasing TFRs (total fertility rates) in many rich countries, this study aimed at assessing the role of different policies in what they called the "recent fertility rebound" (Luci-Greulich and Thevenon, 2013). Their results show that all instruments of family policy (paid leave, childcare services, and financial transfers) had positive influences on fertility. Comparing the different interventions, they found that both in-cash benefits during childhood and childcare services had bigger impacts than leave entitlements or benefits granted around childbirth.

**Findings on the most effective pro-natal policies suggest that parents have a longer time horizon in mind and calculate about that the anticipated stability and persistence of such policies when making fertility decisions. .**

Changing such policies every election cycle or otherwise not guaranteeing their durability undermines the confidence of would-be parents in such support mechanisms.

Another very recent comparative study also takes the latest TFR declines in several industrialized countries into account (Stone, 2020). With a specific view towards the U.S., the asks what the U.S. can learn from the experience of other countries, mostly in Europe. It compares the experiences of Poland and Hungary as prominent examples of large-scale public efforts to boost the birth rate. Studying short-term trends in CBR (the crude birth rate) it shows that in Poland, the birth rate increased rather quickly after the policy initiatives by some 10% before falling to a level that was still 6% higher than prior to such policies. In Hungary, on the other hand, different but equally ambitious efforts have resulted in a 2% short-term increase followed by a decrease, falling to below the initial CBR levels before such policies were put in place. One problem the author speculates in the study is that the Hungarian system is designed to heavily encourage larger families, in particular for couples to have a 3rd child (or more). Still, at only a couple of years old, it is too early to judge the long-term success of these ambitious initiatives and results may change.

In the study described above, Stone also provides a meta-analysis of 34 academic studies since 2000 assessing the effectiveness of specific pro-natal policies, 22 of which contain sufficiently detailed analysis of the policies' effects to be used to estimate how fertility can be influenced by various pro-natal incentives (Stone, 2020). The results show that an increase in the present value of child benefits, equal to 10% of a household's income, can be expected to produce between 0.5% and 4.1% higher birth rates. In summary, the study finds that more financial support does yield more children, but it takes substantial funding. Or in other words, trying to boost fertility rates to replacement levels, purely through cash incentives, is prohibitively expensive.

More fundamentally, what is the goal of fertility policies? Technically, replacement fertility is defined as the level of fertility by which one generation of women is fully replaced by another. In practical terms this is often approximated by a TFR of 2.1 (which is slightly above two per woman, to adjust for child mortality and the sex ratio at birth). In high mortality settings a replacement fertility rate TFR can even be as high as 2.4-2.5, and in very low mortality settings it can be as low as below 2.1. But replacement level fertility does not necessarily mean that the population size is constant in the longer run. This is only the case when the effect of the starting age structure (the momentum of population growth) has disappeared and there is no migration and no further changes in mortality or life expectancy. Since no real population has these features, replacement fertility is really a very abstract concept in the context of stationary population theory – one that has escaped the lab of technical demographers and influenced the thinking of many people who do not really understand the implications or relying on these measurements which are ill-suited for features of the real world.

## Discussion of fertility indicators – which is best to rely on?

Different fertility indicators can tell very different stories. When trying to assess the question as to whether fertility levels should be seen as too low and whether certain policy measures actually influence fertility trends, it is of great importance which indicator is being used.

Up until the 1980s the most frequently used indicator was also the most easily available – CBR, which simply states the number of births in a given country divided by the total population of this country. But this indicator is unsatisfactory for several reasons, mostly because it is greatly dependent on the age structure of a specific population. In a country with a high proportion of women in reproductive age, the CBR can be higher than in another country with fewer women in that age group, even though the number of children per woman might actually be higher in the latter. This fact greatly limits the comparability of CBRs across countries and over time. To avoid this problem, TFR indicator instead uses the sum of all the age-specific fertility rates observed in one country in a given calendar year, thus eliminating the misleading effect of differing age structures across countries and over time.

The TFR is the currently most frequently used indicator and can be interpreted as the mean number of children a cohort of women would have if, at a given age, they experience the age-specific fertility rates observed in this calendar year. This hypothetical cohort of women is sometimes also called a synthetic cohort because in reality, no group of women actually pursues such a set of constant fertility rates. But more recent research has shown that TFR has another problem, in that it is very sensitive to distortions caused by the changing

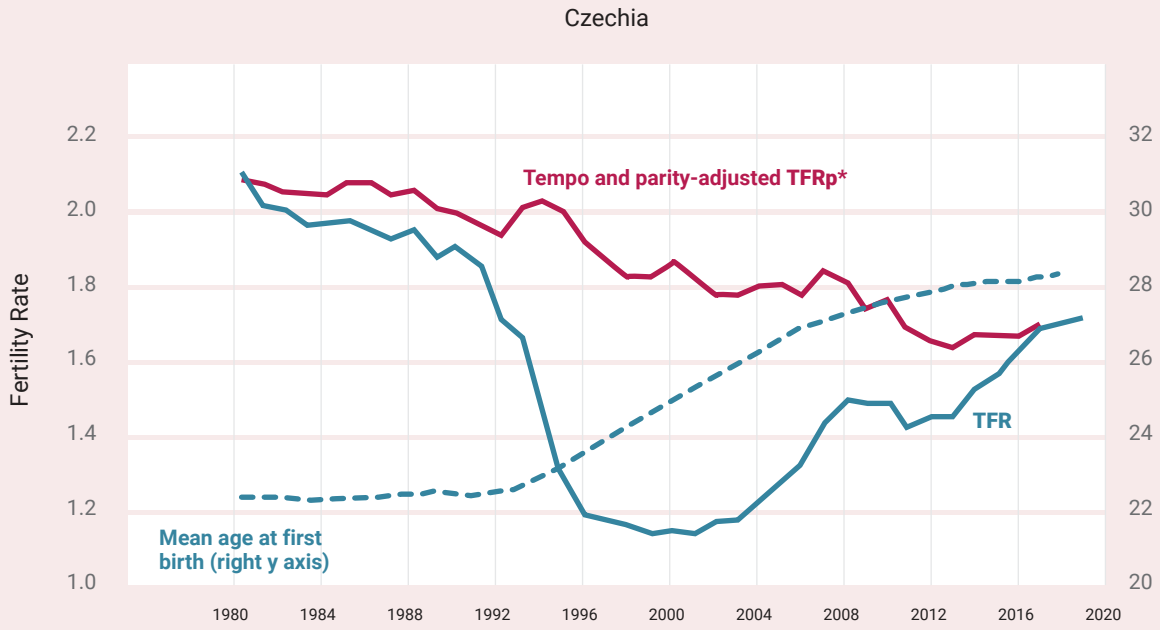



**Figure 6.** ▲
**Fertility Trends in the Czech Republic 1980-2019.**

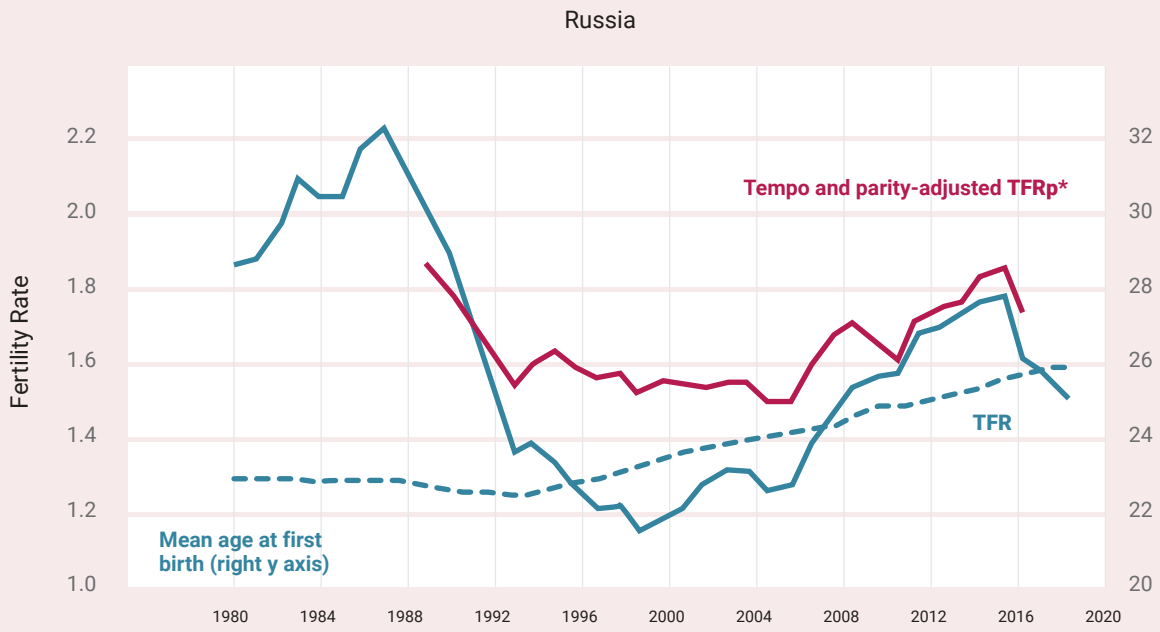
Source (VID and IIASA, 2020).

timing of fertility (called the "tempo effect"). Specifically, even minor changes in the mean age of childbearing have significant impacts on the TFR – for example, if 10% of women decide to postpone their births a year into the future, the TFR for the current year will be 10% lower, even if women have the same number of children by age 45. Meanwhile, the mean age of childbearing would only increase by a tenth of a year.

The impact of these timing, or "tempo," distortions on the TFR indicator is illustrated in the case of another Eastern European country, the Czech Republic in **Figure 6** above. While the TFR was rather stable, at a comparably high level, until the country's transformation in 1990, it entered a precipitous decline falling from around 1.9 to less than 1.2 by 1996 and staying at this very low level until 2003. As the figure illustrates, this steep decline in the TFR was associated with a rather strong increase in the mean age of first birth. Since 2004, the TFR has recovered to its current 1.7 and the increase in the age at first birth has largely stopped. Similar patterns have been observed in many European countries. However, the recent recoveries are very dependent on the technicalities of the measure of fertility and are often hastily interpreted by national governments as successes of their respective policies aimed at higher fertility.

Do these trends in TFR tell the right story in terms of the "quantum" of fertility, or the undistorted level of fertility or the actual number of children women on average have over the course of their lives? The best measure clearly would be completed cohort fertility. This ultimate number of children that women had over their lives can, however, only be assessed once a female cohort has completed its childbearing, which in practical terms requires waiting until age 45-50. For the impatient observer, this is usually too long a period of waiting to understand the impact of certain policies on fertility, in particular since most of the children of this cohort will have already been adults by the time the cohort is "completed," born 20-25 years prior. An effective and relatively new approximation of the ultimate, true level of fertility using contemporary information is called the "adjusted TFR," which is designed to eliminate the distortions due to tempo effects and changes in the parity distribution (Bongaarts and Sobotka, 2012). This adjusted TFR is shown as the orange line in **Figure 6** above. For the Czech Republic, with some minor fluctuations, there was an almost linear decline in the quantum of fertility from the 1980s to the more recent years. There is neither a precipitous decline nor a spectacular recovery, as implied by the TFR. This also indicates that claims that certain policies having led to higher fertility levels in this case would, at best, be valid in terms of slowing the increase in the mean age at births without influencing the quantum of fertility.

**Figure 7** shows comparable graph to **Figure 6** but for Russia, which is probably the most prominent case of robust pro-natal policies in recent years in Europe. The pattern in Russia is actually quite similar to that in the Czech Republic, with Russia experiencing a precipitous decline in TFR from more than 2.0 to less than 1.2 associated with the political,




▲ **Figure 7.**
**Fertility Trends in the Russia 1980-2019.**

Source (VID and IIASA, 2020).

economic, and social upheaval during the 1990s. In Russia, the increase in birth rates has been correlated with quite significant pro-natal measures and is widely interpreted as evidence that such policies indeed work if they are generous enough. The TFR in Russia reached a level of almost 1.8 in 2016, though was most recently followed by a regression of TFR back down to 1.5 in recent years. The orange line in Figure 7 giving the "adjusted TFR" again shows much less fluctuation when relying on the "adjusted" methodology, although unlike the Czech Republic there was a real increase in the estimated quantum of fertility in Russia between 2005 and 2016. Whether or not this higher fertility will continue its momentum will be shown by the data over the coming few years.

But beyond these technicalities, is it really desirable for all populations to aim for the stationary effect that is implied by maintaining replacement-level fertility? A study has systematically addressed this question by asking what the "optimal" fertility level is, according to different sets of criteria (Striessnig and Lutz, 2013). If the goal is for a country to outnumber its neighbors then the "optimum" level of fertility is tied to the competing group. And if the neighbors have the same goal, then the search for an optimum fertility level can become an unsustainable arms race. If, on the other extreme, the goal is to minimize the human footprint on this planet without attaching special value to human life – as is suggested by proponents of strong sustainability measures – then the "optimum" fertility might be as low as zero.

If indicators of human well-being and the cost of population aging are taken as criteria, and if the population is stratified by education groups to account for differential productively, then there is a rather broad long-term "optimum" TFR range, from 1.5-1.8 (Striessnig and Lutz, 2013). From this perspective, the optimum TFR may be below 2.0 because with fewer children, more can be invested in each child, thus enhancing productivity. But below 1.5 the cost of aging and associated pensions would offset this benefit in this economic weighing of costs and benefits, and there are surely tipping points along the way between 1.5 and 2.0 where economies of scale are lost and the broader economy becomes less productive. If other considerations like natural resource degradation or climate change are added into the equation then the "optimum" would be arguably lower, depending on local conditions and the weight that longer-term environmental concerns are given in relation to shorter-term economic concerns. Still, unless we become immortal or migration inflows for a given country become never-ending, at some point (at least over several centuries) any population that does not reproduce itself eventually disappears.

**In the timeframe of policy-making and the plannable, what should be considered as an optimal level of fertility is a matter of values, judgement, and priorities – whether that means below, at, or above a replacement level TFR of 2.1.**

# 7 Economic and Geopolitical Consequences of Population Decline

In the economic literature a lot has been written about the economic consequences of population aging, but much less so on population decline and depopulation associated with strong out-migration (possibly because it has not yet affected the countries in which the leading economists are based). But it is reasonable to assume that the economic effects of declines in population size go beyond those associated with population aging, through lesser economies of scale in terms of market size or certain sectors of the economy that are closely linked to an increasing population, such as the construction industry.

Since economists often tend to think in terms of equilibria, their first approach would be to view population decline as just a transitory phenomenon up until a new stationary population is reached. However, the process of shrinking may lead (a) to significant societal adjustment costs during the transition from larger to smaller population numbers, (b) a change in the distribution of the population as well as a change in the distribution of outcomes (wellbeing) across sub-populations, and (c) possibly different long-term outcomes in terms of economic performance and wellbeing depending on how the process is shaped by policy-making (e.g. the extent to which the shrinking of the labor force can be counteracted by investments in education or other positive productivity gains).

In trying to address more systematically the possible economic challenges associated with population shrinking one can first think in terms of undesirable imbalances arising in the process.[6] The first imbalance refers to aging, which is typically associated with population shrinking. This in turn is creating the well-known problem of a (possible) increase in economic dependency due to the older, more dependent population. The policy challenge is to offset this by ensuring human capital investments, besides increases in female labor force participation and raising the retirement age.

A second possible imbalance lies in the geographical distribution of the population, since in many empirically observed cases of population shrinking there is a tendency for the population to cluster in agglomerations, which implies: (a) regionally differentiated processes of localized shrinkage (or even growth) of populations, which are typically characterized by strong inter-regional migration within the country; (b) cross-regional gradients (often an urban-rural gradient) in terms of the scope or needs for policy-making or even the direction of policy-making (for example, policy needs for the housing market, calling for expansion in agglomerations, but for "downsizing" in rural areas and minor towns). In addition, there are cross-regional patterns of behaviors and attitudes, as well as spillovers (for example, with respect to all the incentives that govern migration); and (c) population sorting (for example, the young and educated moving into agglomerations, leaving the old and lesser-skilled behind), which is a particular challenge in cross-regional migration (and may reinforce cross-regional imbalances).

Finally, in terms of aggregate economic activity, population shrinking (all else equal) will typically reduce total GDP or lead to lower aggregate growth in a country. However, unless pure size of a population is one of the most important factors (for example, for defense, or the ability to undertake large-scale investments in infrastructure), the focus should be on per capita values because this is what matters for the economic well-being of people. Interestingly, lower population growth is traditionally perceived as beneficial for per capita income. The reasoning for this is weaker capital dilution: less investment is needed to equip new workers with capital (and thereby maintain the capital stock per capita) so that a given volume of savings can be invested to increase the capital stock per worker and, thus, raise labor productivity. Lower population growth can bring other economic benefits in terms of higher female labor force participation, the quality-quantity trade-off as a facilitator of human capital investment, and the weakening of congestion effects (related to common infrastructure, the environment, etc.). But there are also possible offsetting effects that negatively influence per capita income in the event of lower population growth: scale effects (or reverse scale effects) of a dwindling population can lead to reductions in specialization and slower innovation, as well as imbalances in the supply and demand for labor leading to mismatch and possible brain-drain effects (in open economies), especially if there is selective migration.

While this list of possible economic implications of population shrinking is only a summary from the state of the economics literature, this list also presents a research agenda for deeper and empirical analysis of the various different mechanisms at work that can have offsetting effects in competing directions. In other words, from a theoretical point of view

6 This section benefited greatly from scientific input from Michael Kuhn.

it is not clear at all whether the economic effects of population shrinking are on balance positive or negative.

**The policy challenge is, thus, to contain the potential negative side-effects of population shrinking by ensuring adequate investments into education or health, so as to raise the human capital per worker by enough to offset through productivity gains a potential reduction in the number of workers.**

Investment into the automation of labor offers another management strategy to produce more output with fewer workers, prospects being pursued by many advanced economies.

Aside from possible economic impacts of population decline there are also widely discussed geopolitical implications from the shifts in relative population sizes due to rapid growth in some parts of the world – in particular in Africa – combined with declines in other parts (such as countries in Europe). But as we have discussed in the introduction and illustrated in several other sections, it is less so the headcount that matters, but rather what is inside the heads that matter most, i.e. human capital mostly in the form of education and skills. Figure 8 below shows the trends in four world regions of populations by level of educational attainment, with reconstructed data back to 1950 and projections according to the "medium assumption" scenarios from the most recent population scenarios produced by joint efforts of the EC and the Wittgenstein Centre (WIC, 2019).

Figure 8 contrasts the two European regions (East and West, using the UN regional definitions) with relatively stable population sizes against the rapidly growing continents of Asia and Africa. While the population of Eastern Europe (including Russia) is clearly on a declining trajectory in terms of total population (from over 300M around 2000 down to less than 250M projected by 2075), the population with post-secondary education is quite strongly expanding to almost 100M. Given the overriding importance of human capital discussed earlier, this is actually a quite promising future trend and looks certainly much less negative than the total population numbers alone would imply through a focus on shrinkage.

In Western Europe the trend is not so different, with the difference of some further projected population growth, mostly due to the assumption of continued migration inflows. The projected expansion of the population with post-secondary education is more rapid in Western Europe than in Eastern Europe due to stronger recent investments in higher education, if trends continue. But there is no reason why Eastern Europe could not try to also pick up speed in its future education expansion, and already the ratio of non-workers to workers in Eastern European countries is often at a more favorable balance compared to Western Europe.

In Figure 8, Asia is clearly the most populous continent with current population levels of 4.6B people, which is almost 60% of the world population. But fertility trends in most Asian countries – in particular in China – have seen a very rapid decline and therefore Asia's total population is expected to peak around 2050, at somewhat more than 5B people, though the highly-educated population will continue to grow. Considering that in 1950 still more than half of the adult population of Asia had no formal schooling at all (the red area in Figure 8), it is remarkable that today more than half have secondary school education (meaning they have completed at least junior secondary schooling) or higher education.

Africa's population is likely to still more than double from its current 1.3B to around 2.8B by 2075. But in Africa today, still a third of the entire adult population has no formal education at all, and the proportion with post-secondary education is marginal. In the theoretical case of current trends continuing for the next decades, Africa would take decades to catch up with where Asia is today in terms of education levels, and only by the end of the time horizon in 2075 would its education levels be comparable to those of Eastern Europe today. Geopolitical changes will depend heavily on the human capital and associated economic performance of countries and world regions. In this respect, education-specific population projections reveal a relatively advantageous position for highly developed countries compared to the future that trends in future population size alone may imply when viewed in isolation.

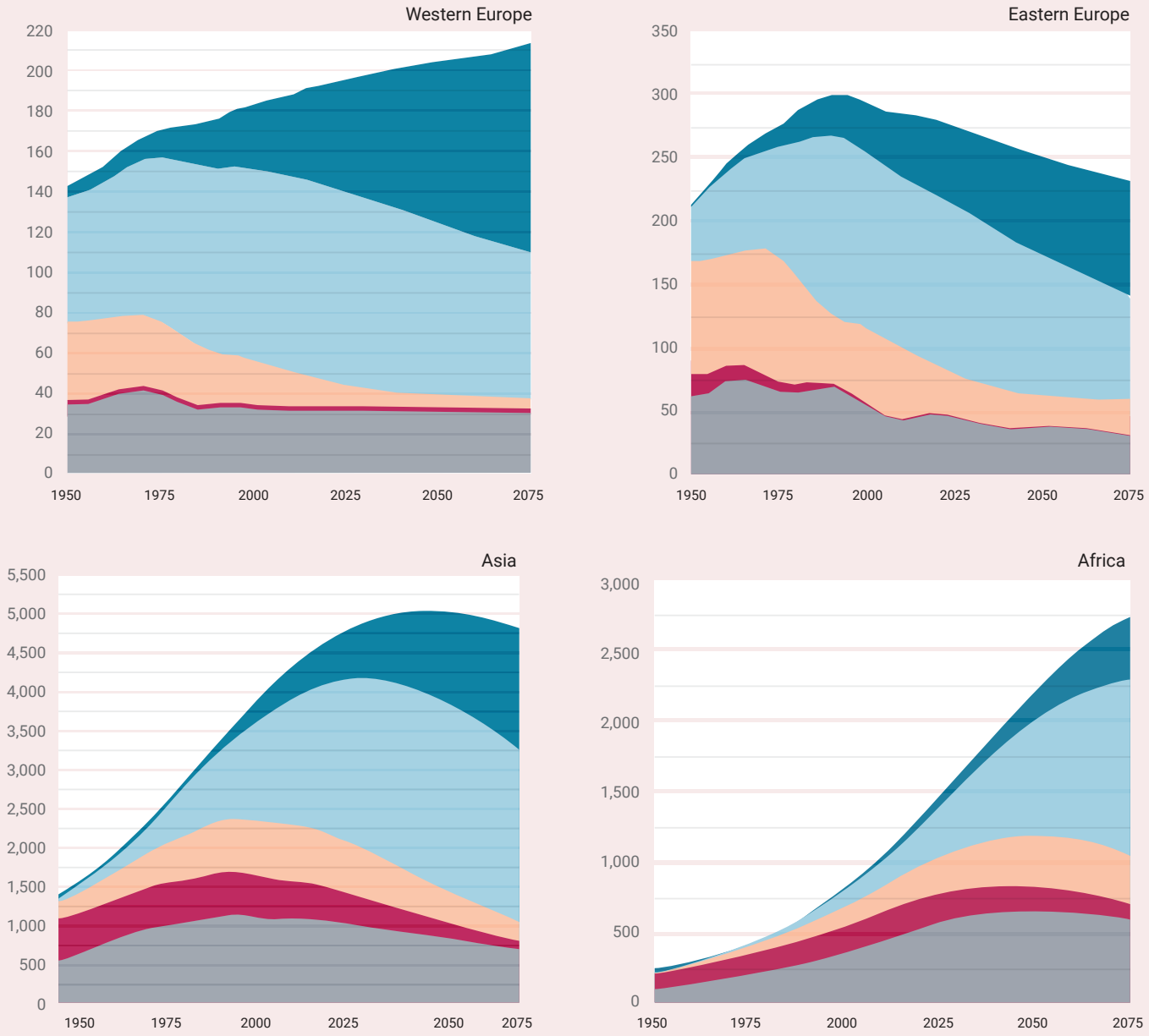



**Figure 8.**
**Actual and projected populations (in millions) by level of education from 1950 – 2075, assuming "medium assumption" scenario across four key UN region.**

Source (WIC, 2019).

# Comprehensive Policy Responses: Strengthening the National Human Resource Base

8

During the second half of the 20th century (at least up through 1994) the dominant population policy paradigm, supported by strong donor agencies, focused on curbing rapid population growth in developing countries through family planning. There were also dissenting voices to this paradigm, mostly from socialist countries at the time, that pointed at the importance of population growth for social and economic development. In the 1980s the view that population was a neutral factor with respect to development also became a popular belief. The beginning of the new century has seen increasing differentiation, if not confusion, about the goal of population policies and the appropriate instruments for pursuing them. While before 1994, fears relating to population growth in developing countries dominated discussions in international fora, some forms of pro-natalism have always existed and shaped the policies of certain countries, though they had distinctly specific national perspectives. The 1994 International Conference on Population and Development ("*ICPD*") in Cairo codified a major shift away from demographic targets to a focus on individual reproductive and human rights. While important from a human rights perspective, this shift also resulted in generally less attention given to aggregate population-level considerations. There now remains a vacuum with respect to population policies addressing populations in the proper meaning of the word, as aggregates of people whose changing size and composition is consequential for the well-being of individuals and societies alike.

Today, governments of an increasing number of countries, whose low fertility levels and rapidly aging populations cause serious concern, are actively searching for policy interventions that are both effective at the population level and socially acceptable at the individual level. This issue is exacerbated in countries like Serbia that experience significant out-migration and thus lose people and their skills to other countries that pay higher wages. It is this combination of negative natural growth (the balance of births and deaths) and significant out-migration that makes depopulation a hot issue of highest policy concern in the countries affected by these phenomena.

What would be an appropriate population policy paradigm that could effectively address these concerns of depopulation and at the same time also be applicable more broadly to other countries that are still at earlier phases of their demographic transitions? In an article entitled "*A Population Policy Rationale for the Twenty-First Century*" it was suggested the goal of population policies ought to be to strengthen the human resource base for national development as well as global sustainable development (Lutz, 2014). Population policies with this purpose can be viewed as "public human resource management," to stress an analogy that is widely understood among the private sector. Under this approach no certain population size, specific growth rate, set fertility rate, or a particular age structure is viewed as a goal in its own right. Within the human rights framework, population policies should – rather than achieve what could be arbitrary targets – try instead to efficiently and flexibly manage our public human resources to achieve the highest long-term well-being of current and future generations.

**Similar to a big company that tries to train its employees and retain the talent it employs, a national government should also have consistent and coherent strategies in education as a way to help its people establish satisfying working lives and build up the human resource base of their country.**

The instruments for pursuing such aims involve a broad range, from family and social security policies, to education and health policies, to migration and labor market policies. Education in particular, as the most important state institution for preparing young people, should prioritize giving the next generation the skills (quality and type) a country needs from its labor force for meeting its collective needs, both to the benefit of individuals and the country as a whole. Such policies to limit gaps in skills should involve several of the existing ministries which typically work in isolation on specific sectors rather than feeling responsible for cross-cutting collaboration to jointly address the different aspects of human resources. It might even be worth thinking about the creation of a new coordinating agency (or new ministry) directly reporting to the Prime Minister that would oversee the synergistic collaboration of public efforts to this end. Comprehensively addressing the challenge of public human resource management can help to integrate the often-separate policy areas into one overarching policy to the benefit of each country, its economy, and its population.

For highly developed countries, a lack of coordination on these matters and resulting labor shortages often mean that labor migration policies compete against the goals of international aid or regional development, all of which are expressed by the same government. As a matter of good practice and to avoid these disconnects, there should be explicit consideration of how relevant policy decisions impact the human capital resources of the countries of origin in the case of high out-migration areas. Already in the 1970s these concerns sparked heated discussion at the UN after economists Bhagwati and Dellalfar proposed a tax on professional and technical emigrants from developing countries to help repay the communities for their consuming of the developing country's limited educational resources, and transferrance of this "wealth" and the unrealized contributions they were expected to make in the richer countries rather than their home country (Bhagwati and Dellalfar, 1973). This was seen as administratively and even more so politically difficult to implement, but it is not without precedent that a country requires a tax relationship with its citizens abroad, as for example the U.S. today requires of its citizens working abroad. While Bhagwati and Dellalfar's direct correction of externalities focused on the individual who had benefited from a developing country's investment in them, later variations of the proposal dealt with the topic at the country-level, requiring the active recognition of the problem by governments and potentially uncomfortable changes on the part of the highly developed countries.

In Europe specifically, there is much talk of solidarity, which perhaps in its most agreeable form can be defined as pursuing mutually beneficial interactions of countries between and among each other.

**To the extent that indifference, active recruiting, and policy frameworks fuel the persistent out-migration – especially of highly educated individuals – from more economically vulnerable and depopulating neighbors, it should raise questions of solidarity.**

This is perhaps easiest to understand and less abstract when the outflows get dramatic, as in the case of Romania losing approximately 50% of its medical doctors to its fellow EU Members over the last 10 years. A domino effect has ensued as Moldova lost similar proportions of its medical doctors to Romania, with the poorest most often paying the price in the end. For what is sometimes talked about as a force of nature, these outflows are inevitably partial products of political decisions or indecision in both the sending and receiving countries. Besides the self-interest countries have for crafting coherent national human capital management strategies with the purpose of meeting their needs, it is also a matter of acting responsibly for those leaders in the international community.

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