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Silver Economy: Pipe Dream or Realistic Possibility?

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Silver Economy: Pipe Dream or Realistic Possibility?

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Abstract

This paper juxtaposes a set of popular myths with evidence and draws three conclusions: First, demography is not destiny – rather, destiny is whether aging societies are able to undergo structural economic reforms which adapt these societies to a different demographic environment. Second, evidence is needed to show that such reforms are possible and have paid off. Third, older individuals have changed. They are healthier and more productive than the generations before. A flourishing silver economy is thus a realistic possibility – but it does require adaption of labor markets and pension systems.

Silver Economy: Pipe Dream or Realistic Possibility? [1]

Axel Börsch-Supan

1. Introduction

For many, the perspective of a "silver economy" is simply a pipe dream. The doubling of the old-age dependency ratio in most industrialized countries seems to translate in fewer workers per consumer, thus less productive capacity; more older people see to imply higher taxes and contributions for pensions and health care, thus less consumption possibilities; and the fact that there are fewer buyers when the babyboomer will try to sell their assets seem to precipate an asset meltdown. This paper argues that such a grim outlook is indeed a possibility. On the other hand, however, will living longer and being healthier actually constitute an increase in economic ressources rather than a decline. Hence, aging economies are by no means bound to experience such stagnation or even decline of living standards. Rather, the macroeconomic perspective of an aging society entirely depends on individual behavioral reactions and the political economy. The key conclusion of this paper is therefore that the main danger of population aging is the lack of adaptation to a new demographic situation and not population aging itself.

Many myths surround individual and social behavior and the potential to adapt. They form the body of this paper. Most of these myths are linked to misconceptions about health and productivity and the general economic and political ability of an aging society to function.

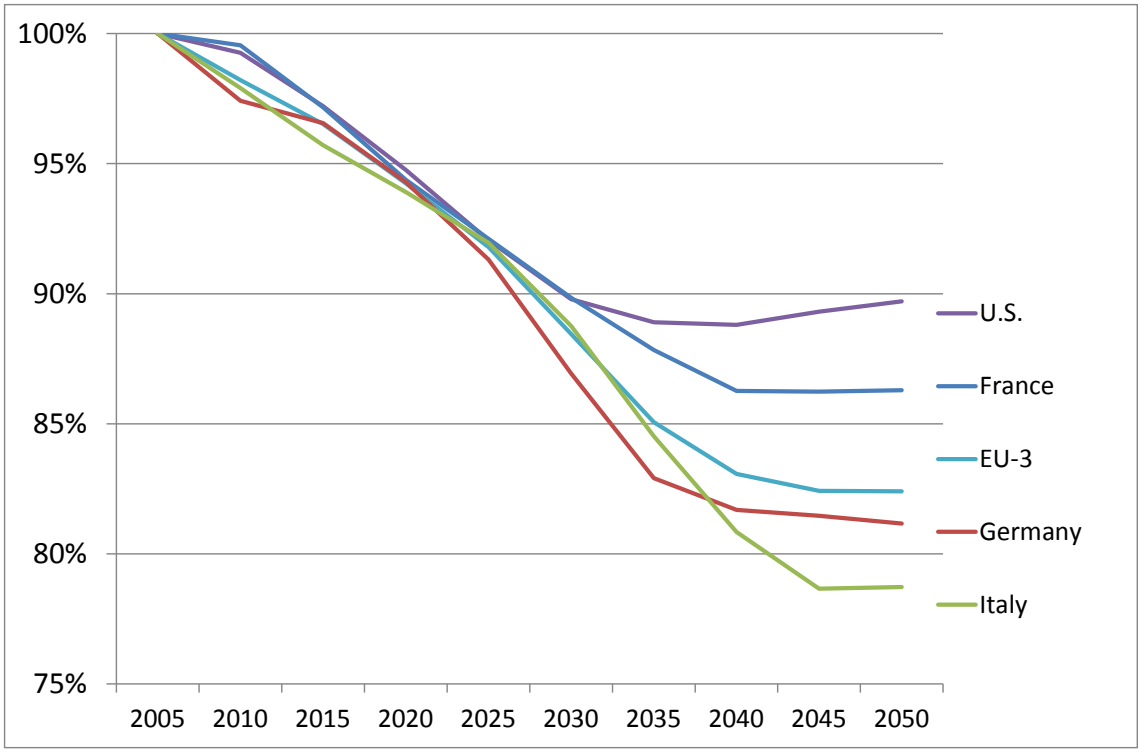
We find ample evidence that health at older ages has improved to support increasing labor force supply at these ages. The evidence does not support the myth of quickly falling productivity after youth. The idea that older workers are taking jobs away from the young is simply a fallacy. There is thus potential for a thriving silver economy – if only we adapt to the reality of an aging population.

[1] Paper prepared for the Expert Workshop on "The Silver Economy: Facts, Challenges and Opportunities" held in Oxford, UK, 26 June 2014. The body of this paper is a condensed version from Börsch-Supan (2013) which has been published in the Journal of the Economics of Aging.

2. Does population aging invariably reduce living standards?

The macroeconomic core of population aging is the declining share of the working age population (WAP) in total population, see Figure 1, here defined as the share of people between age 20 and 65, normalized to 100% in 2005.

Figure 1: Working age population



Source: Own projection. Mortality based on a Lee-Carter decomposition using past mortality rate changes derived from the Human Mortality Database (2012); constant fertility rates (France: 1.89, Germany: 1.34, Italy: 1.29); and constant migration flows, based on the UN (2010) projection (France 100,000, Germany 150,000, Italy 135,000 net migrants p.a.).

The decline is large and shows dramatic differences across countries: it is more than twice as large in Italy as in the United States. Also France will experience a decline in its working age population, but much less so than Germany or Italy.

Since labor is the most important factor of production, the force of population aging on economic growth is, in a very rough first approximation, proportional to the decline of WAP. This is the main rationale for a bleak outlook on living standards, especially in countries like Italy and Germany.

On second view, however, the many versions of exhibits like Figure 1 exemplify the lack of adaptation to an aging world rather than the likely outcome of the aging process. They symbolize the myth that aging necessarily implies declining living standards by falsely equating demography with economics. The quick conclusions drawn from

Figure 1 and its siblings presuppose a fixed labor supply and unchanged institutions, such as labor markets and pension systems.

Some indication for the room to maneuver is given by the levels of current labor force participation. They are normalized to 100% in Figure 1 but vary dramatically. In Italy, for instance, not only the number of working individuals is decreasing quicker than anywhere else but Italy also has the lowest level of the employment rate: less than three quarters of the WAP (73.1%) are actually working compared to the US. Aggregate labor force participation is higher in France and Germany but still considerably lower than in the US (81.5% and 86% of the US level, respectively). Convergence of the levels therefore implies less divergence of the changes.

This room to maneuver can be exploited along three lines: change in labor market institutions; change in pension systems; and behavioral reactions to those institutional changes. Pension and labor market reforms lift current labor supply restrictions; they permit, e.g., later retirement by actuarially designed pension systems (e.g., Börsch-Supan and Schnabel 1998, Gruber and Wise 2004), make more female labor force participation possible by providing better day care facilities (e.g., Sundström and Stafford 1992, Spiess 2011), or enable students to enter the labor market earlier by better organized education systems.

Börsch-Supan and Ludwig (2010) provide a formal model to project the effect of such labor market and pension reforms. Households are modeled to respond to the institutional changes by changing their working hours (the intensive margin of labor supply). Endogenous hours' supply may increase, e.g., if distorting social security taxes and contributions decline in the wake of pension reform. The opposite reaction is also possible. Endogenous hours' supply may decrease in response to an exogenous change of the number of working persons, e.g., if there is intra-household substitution between the number of persons working and the hours worked by each person. Moreover, older workers, now forced to work longer, may exploit part-time opportunities given by the pension system. In some countries (e.g., Finland and Germany) such opportunities have led to a very early transition to part time work with the perverse result that in some sectors hours supplied actually decreased in response to pension reform (Börsch-Supan 2005, Hakola 2003).

Börsch-Supan, Härtl and Ludwig (2014) apply such a model to the three countries in Figure 1: the three most prominent "old" European countries, namely Italy, Germany

and France, which will be contrasted to the rest of the developed world which is modeled after the United States because its economic size dominates so much the other developed countries. The countries are linked by global goods and capital markets with a single world rate of productivity-corrected return. This is important since globalization substantially dilutes aging effects in those countries which are aging the most (Börsch-Supan, Ludwig and Winter 2006).

Country-specific population aging enters through a standard demographic model of the number of workers and retirees with exogenous future increases of life expectancy, constant birth rates, and exogenous migration at the average experienced over the last decade.

Such macroeconomic models are highly abstract. They predict long-run and smooth trends measured in decades such as population aging and its implications and indicate what is likely to happen if one acts and what is likely to happen if one does not act. In order to have confidence in these models, they are calibrated to past data on output, consumption and labor supply, here from 1960 to 2000.

We use this model to show that fewer restrictions in the labor market and a less distortive pension system on future living standards may compensate for, even overcompensate the effects of population aging. To be concrete, labor market restrictions are relieved in three directions:

(a) workers exit the labor force two years later;

(b) they start working two years earlier; and

(c) higher female labor force participation approaches 90% of male labor force participation.

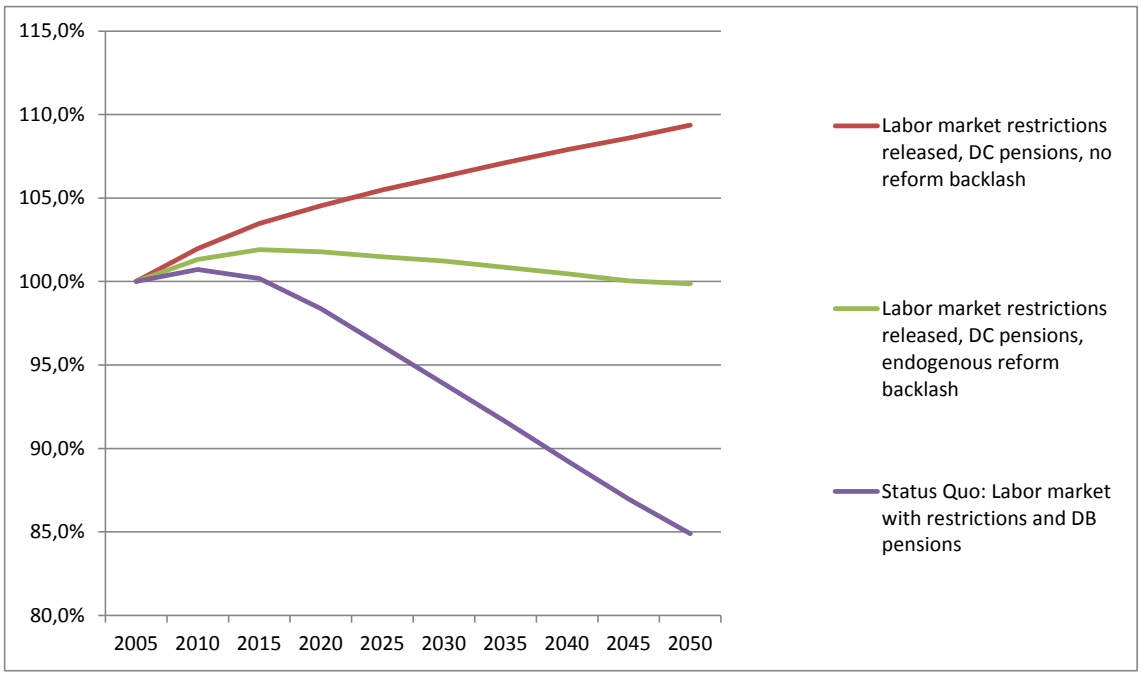
Together, this roughly corresponds to the difference between the France-Germany-Italy trio and high labor force participation countries such as Sweden or Switzerland.

Second, two old-age pension regimes are contrasted. Extreme one is a defined benefits pay-as-you-go pension system which raises its funds through a distorting income tax and pays the same flat pension benefit for everybody. The other extreme is a defined contributions fully funded savings regime in which each worker optimally chooses how much old-age saving to accumulate and then withdraw, guided by the standard life-cycle calculus.

In order to get an impression of the strength of behavioral reactions, these reforms are once modeled with the behavioral reactions implied by the labor supply equations of the model, and once for a fixed labor supply independent of demographic change and the policy scenarios.

Figure 2 shows three of the resulting eight trajectories. Depicted is the development from 2005 to 2050 of living standards measured as the amount of goods and services consumed per capita, normalized to 100% in 2005. The trajectories thus depict changes net of the average of historical growth. The 100% line can be interpreted as the development of living standards in the absence of population aging and institutional changes.

Figure 2: Expected living standards in France-Germany-Italy relative to a non-aging population



Source: Based on Börsch-Supan, Härtl and Ludwig (2014)

The first impression derived from Figure 2 is that living standards may rise or decline. Anything is possible, depending on the reform forces, which we are able to apply, and the resulting behavioral reactions. It is a myth that living standards must necessarily decline. They rather depend on which policy options are adopted and how people react to them.

If labor markets and pension systems remain as they are – with current retirement ages, obstacles to female labor force participation, defined benefit pension system financed by

distorting taxes and contributions – living standards in France-Germany-Italy are projected to decline until 2050 by about 15% relative to a non-aging population.

Labor market and pension reforms which put more people at work in the aging economies and reduce the distortions in the economy make a larege difference in terms of future living standards: they can be maintained or even increased, in spite of population aging. More than three quarters of the effect is generated by unrestricing the labor market: labor force participation in the France-Germany-Italy trio approach Swedish and Swiss standards. The remaining effect is generated by getting rid of the distortive taxes in a flat-benefit PAYG system which lowers the burden for the younger generation and increases labor supply furthermore. Workers do not escape into less efficient black market production, or do not withdraw from the labor market altogether. The additional labor volume contributes to higher living standards. Labor market and pension reforms interact: the effects of more labor supply are strengthened by capital market effects. Economic situations with a more active labor market also create higher returns, will be more productive in general, people will save more, and thus the level of investments is higher, again permitting higher living standards.

The final lesson from Figure 2 is about behavioral reactions. Negative behavioral effects dominate the positive ones and render the actual effects smaller than the direct policy effects. This is due to the calibration of the model which reflects the historical experiences of reforms and the reaction to them during the calibration periods 1960-2000.

To summarize, it is simply wrong that aging economies must nessecarily face declining living standards. Decline can be avoided: not demography, but economic policy is our destiny.

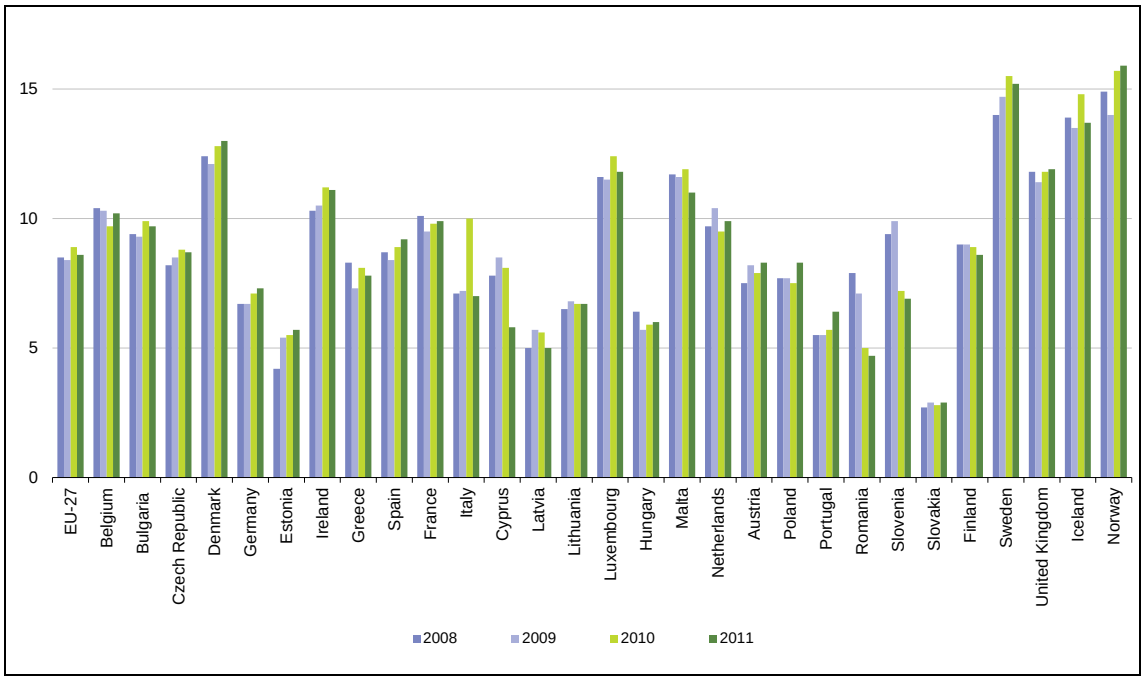
3. Does declining health limit the capacity to work at older ages?

It is a myth that old people are too sick to work until or after current statutory retirement ages, mostly 65. While there is no doubt that normal human aging is associated with progressive reductions in the function of many organs from their peak in early adulthood, the impact of these physiological changes on the capacity of individuals to function in society is quite modest (Rowe et al., 2009). The common exaggeration of the diminished function of older persons is due in part to archaic views of the elderly which overlook the significant compression of morbidity that has occurred over the past

decades (Freedman et al. 2004). This holds notwithstanding that this past trend cannot be simply projected into the future, at least in the US (Freedman et al. 2013).

Figure 3 shows the disability-free life expectancy in Europe at age 65, defined as the time from age 65 until a first disability incurs which respondents in the EU-SILC data self-report as "limiting activities that people usually do".

Figure 3: Disability-free life expectancy at age 65



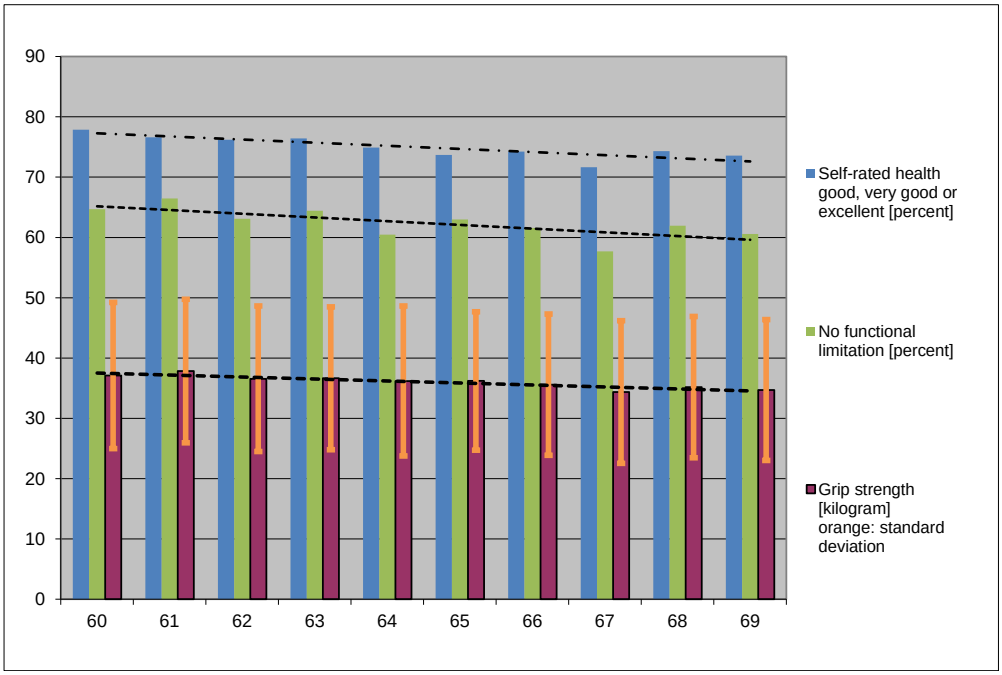
Source: Eurostat (2013)

Two observations are noteworthy. First, in most countries disability-free life expectancy has increased. Second, for the EU on average and also for the three countries considered in the macro model, disability-free life expectancy is higher than the average retirement age, in Italy by 2.3 years, in France even by 3.6 years.

Figure 4 gives a more detailed picture by age and measures health in three degrees of subjectivity: self-assessed health (in 5 categories from excellent to poor); self-reported limitations in 10 different daily activities; and grip strength measured in kilogram. The figure is based on the Survey of Health, Aging and Retirement in Europe (SHARE). As opposed to the myth, older people in the SHARE countries perceive themselves as relatively healthy and perform well on the basis of both objective and subjective measurements. Although there is a decline in health between ages 60 and 69, it is much smaller than the variation within each age group (shown as error bars for the grip strength measure). At age 69, there are about 7 percentage points more individuals

affected by activity limitations than at age 60; shifting the retirement age from 65 to 67 years would therefore imply that only about 1.5 percentage points more workers have at least one activity limitation.

Figure 4: Subjective and objective health measures in Europe, age 60-69



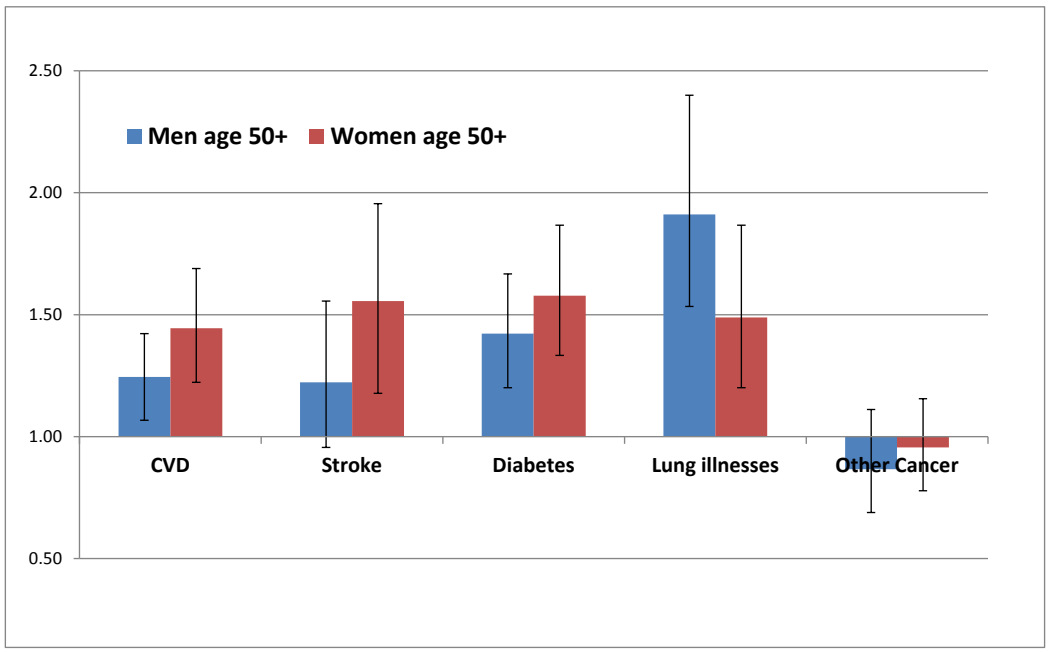
Source: Own computation based on SHARE

This evidence leads to several conclusions. First, health is not the primary cause of retirement in Europe. Second, shifting the retirement age by two years is not bound to fail due to health problems. Third, and more generally, however, fixed retirement ages are not reasonable. People with health problems need to retire earlier, whereas most people could easily work longer. A flexible retirement system with early exit routes governed by a mixture of incentives (including actuarial adjustments) and disability pathways (including medical exams) would be the most appropriate way to deal with these differences.

Some of these differences are clearly related to socio-economic status. Figure 5, again based on SHARE data, shows the log-odds of certain diseases by education, where educational status is divided into two groups (with and without high-school degree). While the existence of a socio-economic gradient is clearly visible, the causal pathways behind this gradient are complex. It is noteworthy that illnesses associated with health behaviors (diabetes and lung cancer in Figure 5) exhibit particularly large gradients, while other cancers show none. We know that health behavior is strongly correlated with education (Miguel and Kremer 2004, Fogel et al. 2011). This finding thus mirrors

the role education plays in other social contexts, e.g., that the economic returns from education in the labor market and the health benefits associated with additional years of schooling have both expanded sharply over time. Another pathway is related to the work environment and work stress (Siegrist et al. 2005, Bryson and Ilmakunnas 2012). Again, this means that one needs to take care of a better work environment at much earlier ages than shortly before retirement.

Figure 5: Relative frequencies of illnesses by education in Europe



Source: Avendano et al. (2005)

4. Are older workers really less productive?

This impression is widespread and implicit in many discussions about aging, even in economic textbooks (Lazear 1995, p. 40, figure 4.1). Often regarded as an established fact, it has profound implications for personnel policies by employers and retirement choices made by employees. It is used as a motivation for early retirement policies in many countries. Moreover, if the impression were true, population aging will have negative effects on overall productivity as the share of older workers is increasing, contradicting the exogeneity assumption of technical progress in the model at the outset of this article.

Estimating age-productivity profiles has been on the agenda of labor economists for a long time (Skirbekk 2004, Gelderblom 2006). It encounters many methodological challenges which have made it hard to distinguish fact from fiction.

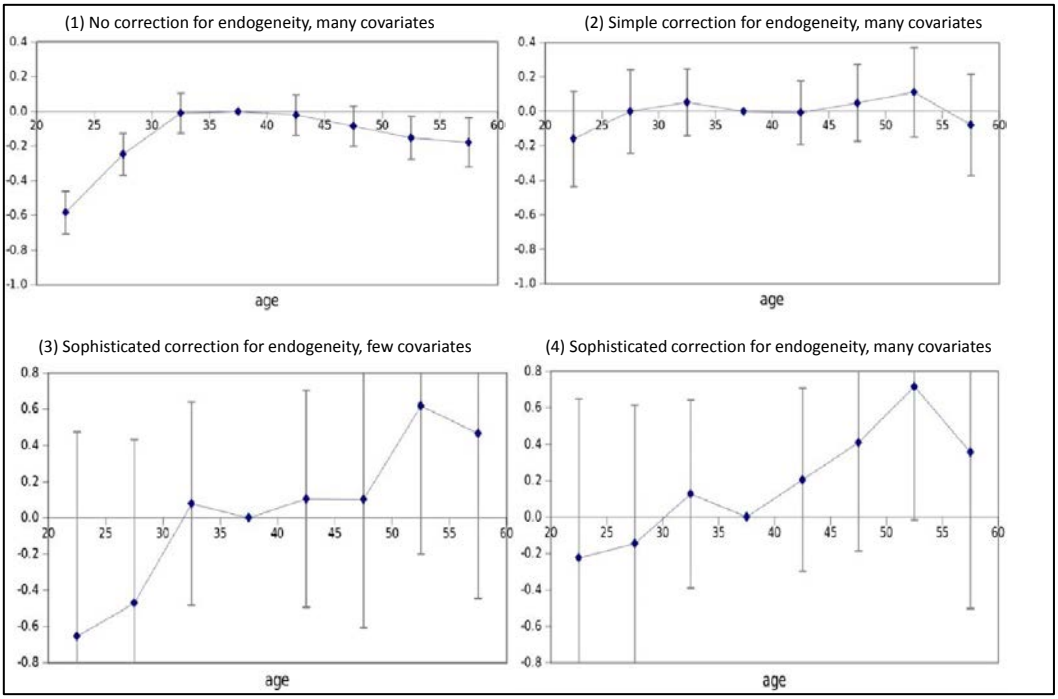
First, productivity is hard to measure directly. While it is well documented by occupational medicine, cognitive psychology, and gerontology that muscle strength, sight, lung, kidney, and heart functioning, and many other biometric indicators deteriorate from early age onwards, experience and the ability to deal with human nature appear to increase with age. Since the latter characteristics are hard to measure, there is a bias towards direct measures that decline early in life. This may have contributed to the above-mentioned impression.

Some early studies use individual's wages as a productivity measure. Wages, however, often increase with age and/or seniority independently of productivity, and wage *de*creases are extremely rare. Another method relies on managers' subjective evaluations of their employees' performance. These supervisors' assessments are problematic because they may reflect prejudices about age-productivity profiles.

A second challenge is the endogeneity of the age composition through various selection processes. Employers are more likely to hold on to productive than unproductive workers. A related problem exists on the company level: Since more productive firms are usually more profitable, they expand and increase their workforce. This leads to a rejuvenation of their workforce because new hires are more likely to be young. Relating productivity to the age of the workforce in this case results in a spurious negative correlation between productivity and age.

Plant level productivity can be measured easily and reliably, and the level of aggregation is a compromise between individuals and companies. Nevertheless, the age structure of plans is not exogenous as just pointed out. The methodologically most convincing papers (Aubert 2003, Aubert und Crépon 2007, Malmberg et al 2008, Göbel und Zwick 2009) estimate age-productivity profiles which increase up to the age of 50-55 years and then stay flat, contradicting the myth. It is noteworthy that the relative productivity of older workers becomes higher when more sophisticated econometric methods are applied, see Figure 6.

Figure 6: Age-productivity profile for different econometric specifications

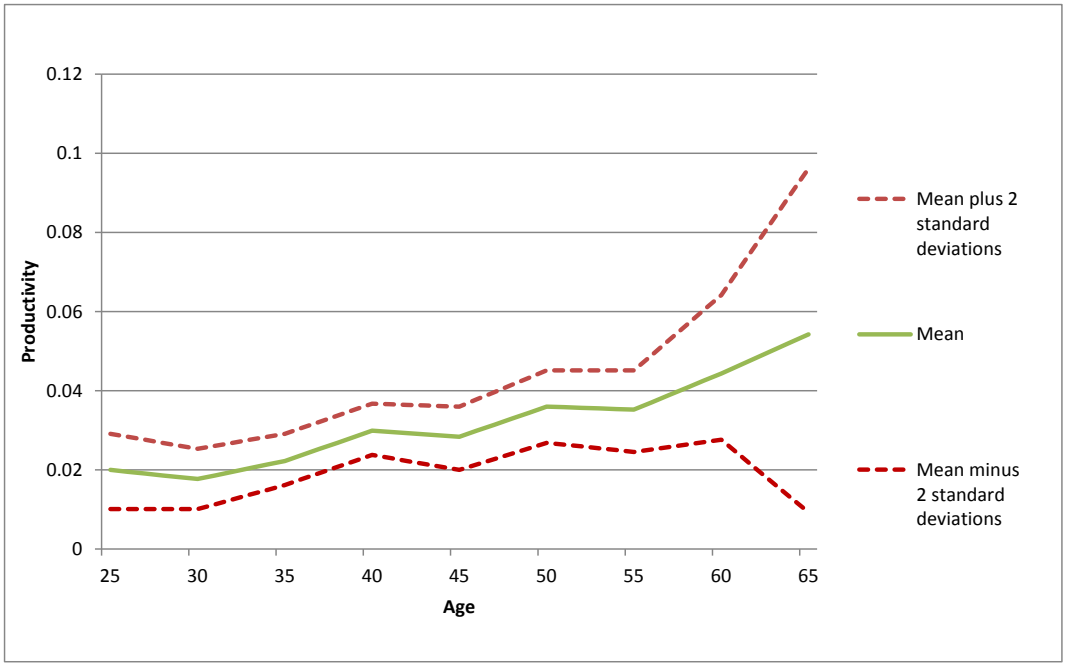


Source: Göbel und Zwick (2009)

The study by Börsch-Supan, Düzgün and Weiss (2006) measures average performance of small working teams in a German truck assembly plant. This plant follows a highly taylorized production process typical for the manufacturing industry. Productivity can be nicely measured as the inverse number of mistakes made in assembling a standardized product in a fixed time. Compared to many service-sector jobs, productivity in this plant requires more physical strength, dexterity, agility etc. (which tend to decline with age) than experience and knowledge of the human nature (which tend to increase with age). Hence, this setting is most likely to confirm the myth of declining productivity with age.

It does not, however. Figure 7 shows the age-productivity profiles measured in this plant, based on more than 1.2 million observations. Due to the very large number of observations, a sophisticated identification strategy based on fixed effects and a two-sided selectivity correction is possible without losing as much precision as the plant-based studies. The estimates do not show a decline in the relevant age range. On the individual workers' level, productivity actually increases monotonically up to the mandatory retirement age of 65 years.

Figure 7: Age and productivity on the assembly line



Source: Adapted from Börsch-Supan and Weiss (2010)

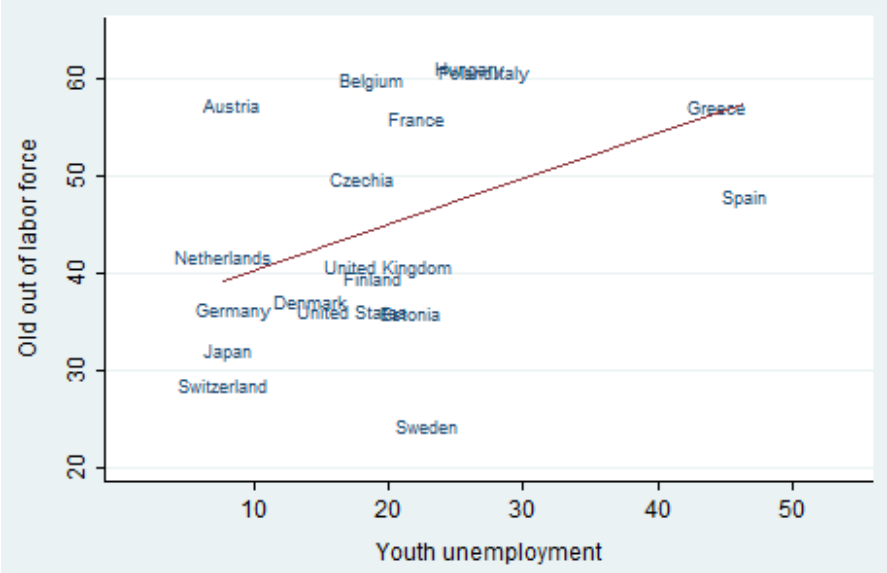
We conclude that even in a work environment requiring substantial physical strength, its decline with age is compensated by characteristics that appear to increase with age and are hard to measure directly, such as experience and the ability to operate well in a team when tense situations occur, typically when things go wrong and there is little time to fix them. While younger workers are of course different from older ones, in terms of productivity, the differences seem to even out.

5. Do older workers take jobs away from the young?

This myth, the so-called lump-of-labor fallacy, is probably the most damaging myth in economics. It comes in many forms. While claiming that women crowd out men has become politically incorrect, the very same fallacy is still alive when it concerns foreign or older workers. The belief is deeply rooted in the analogy to a small enterprise with a fixed and small number of clients which have a fixed demand for the product of the enterprise. Such an enterprise is boxed into a fixed amount of output, and therefore can only employ a fixed lump of labor. Figure 8 suggests that this boxed-in enterprise is not a good analogy to a sufficiently large economy. It shows that in cross-national comparison, higher employment of older individuals is actually *positively* correlated with higher employment of the young, i.e., countries with a high prevalence of early

retirement have, in general, *higher* unemployment rates and *lower* employment of the young.[2]

Figure 8: Early retirement and unemployment in the OECD



Source: Own calculations based on OECD Employment Outlook 2012

It is therefore an important task to provide a causal interpretation which goes beyond the purely suggestive correlation in Figure 8. The theoretical framework behind such causal analyses is the macro-economic model in Section 2 of this paper. It is noteworthy that this model produces a positive correlation between retirement age and employment.

This suggests pension reforms as instruments for identifications. Since there are many confounding factors operating at the same time in aggregate data, strong and isolated reforms are needed to empirically identify the effects of pension policies on labor market outcomes for the young. If pension reform is just one element in a reform package which also includes labor market reforms, it may be impossible to identify which reform element actually caused the results.

Moreover, we have to care about the potential endogeneity of pension policy changes. If a pension reform was triggered by higher youth unemployment, the reform cannot be used as an instrument in econometric analysis, and causal analysis will fail.

Germany provides a particularly neat case since three strong and isolated reforms in the years 1972, 1984, and 1998 can be identified that dramatically changed retirement incentives. Börsch-Supan and Schnabel (2010) summarize their effects as follows:

[2] The R-squared of the correlation is 18%. This is not driven by the outliers Greece and Spain. Without these crisis-ridden countries, the positive correlation gets even stronger with a R-squared of 21%.

- The 1972 reform was not driven by labor market considerations. It dramatically reduced retirement age, labor force participation, and employment of older individuals. In spite of the dramatic reduction of old-age employment in the aftermath of the 1972 reform, youth employment did not increase.
- The "bridge to retirement" introduced in 1984 decreased employment of individuals aged 55-59 further. Their unemployment rate went dramatically up, indicating the popularity of using unemployment insurance as an early retirement pathway. Employment of the young, however, did not go up in response.
- The phasing in of "actuarial" adjustments after 1998 reversed the trend of early retirement. Employment increased from 30% to 40% in the age group from 60 to 64 years. There is a very slight concurrent decrease in employment of the young.

Hence, in two cases employment of the young and the old moved in tandem up or down. For the third case, the time after 1998, Börsch-Supan and Schnabel show in their regression analyses, that the slight decrease in employment of the young is a reflection of the business cycle and not a response to the introduction of actuarial adjustments. Correcting for this, they find again a positive correlation between the employment of the young and the old.

The analysis by Börsch-Supan and Schnabel is part of the work by an international team around Gruber and Wise (2010) using pension design changes in 11 countries as instruments to identify how higher or lower employment of older individuals has affected the employment of the young. The results in the other countries vary considerably across specifications, many remain insignificant. Of the significant ones, only few specifications support the myth, while many more support the positive correlation visible in the time series data.

Hence, the suggestive power of the often invoked analogy of a small enterprise with a fixed and small number of clients as a model for a sufficiently large economy is grossly misleading. In contrast to a small enterprise, entire economies can grow, increase the demand for all goods and services, and therefore also the demand for labor. Moreover, costs for early retirement cannot be put on somebody else's shoulders as enterprises often can do it. In an entire economy, all social transfer expenses have to be borne by tax and contribution payers. Since costs for early retirement increase total labor compensation of the young, thus make their labor more expensive, early retirement for

the old causes less employment of the young. While this argument may be almost trivial for a trained economist, it has not yet reached the general audience and keeps impeding labor market reforms.

6. Conclusions

This paper has juxtaposed a set of popular myths with evidence, often based on internationally comparable data. I like to end with three conclusions.

- First, the paper has started with a macro-economic simulation model that shows that demography is not destiny – rather, destiny is whether aging societies are able to undergo structural economic reforms which adapt these societies to a different demographic environment.
- Second, evidence is needed to show that such reforms are possible (e.g., have been successfully adopted in some country) and have paid off. Notions about population aging are particularly loaded with highly emotional prejudices and myths, and evidence is needed to disprove them. Moreover, such results need to be communicated. The still prevailing strong suggestive power of a fallacy such as the lump-of-labor view symbolizes a particularly pernicious communication failure of our profession.
- Third, older individuals have changed. It is not trrue that individuals around the prevailing retirement ages are mainly ill and unproductive. The contrary is true. While health declines between age 60 and 69, most individuals remain healthy throughout this period. It is the large variation whichz should give raise to concern:; the variation within each birth cohort is much larger than the decline between age 60 and 69. Similar in productivity: While the interpersonal variation in productivity is large, average productivity in a standard working environment shows a flat, maybe even slightly increasing age trajectory since experience outweighs slower speed and less muscle stength in a modern economy.

A flourishing silver economy is thus a realistic possibility and not just a pipe dream – but it does require adaption of labor markets and pension systems.

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