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”Economic Possibilities for Our Grandchildren” 75 Years after: A Global Perspective

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Abstract

In the heart of the Great Crisis, amidst great uncertainty and concerns surrounding the future of capitalism, John Maynard Keynes launched his optimistic prophecy that growth and technological change would allow mankind to solve its economic problem within a century. He envisioned a world where people would work much less and be less oppressed by the satisfaction of material needs. To what extent have his predictions turned out to be accurate? This essays attempts to provide some answers.

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In the heart of the Great Crisis, amidst great uncertainty and concerns surrounding the future of capitalism, John Maynard Keynes launched his optimistic prophecy that growth and technological change would allow mankind to *solve its economic problem* within a century. He envisioned a world where people would work much less and be less oppressed by the satisfaction of material needs. He made quantitative statements predicting that "the standard of life in progressive countries one hundred years hence will be between four and eight times as high..." as in his time. And he wrote about worktime that "...a fifteen-hour week may put off the problem for a great while." He also expected the new era to bring about "great changes in the code of morals", such that the new society will "honour those who can teach (us) how to pluck the hour and the day virtuously and well, the delightful people who are capable of taking direct enjoyment in things...."

To what extent have his predictions turned out to be accurate? Economic growth indeed resumed during the 1930s, but the conflagration of World War II was soon to come. Yet, after the end of the war, the engine of growth restarted, and the world thereafter underwent an unprecedented transformation. And people today indeed spend a smaller fraction of their lives in work activity. However, there are large differences in both standards of living and attitudes towards work across countries and individuals.

In this essay, I assess Keynes' forecasts from a global perspective. In the first section, I review and discuss the growth experience of the world in the second half of the Twentieth Century. Next, I discuss Keynes' predictions about working time and leisure. Finally, I conclude.

1 A half century of growth: the empirical evidence.

Diverging from Keynes' focus on "progressive countries", I consider the long-run growth experience of the entire global economy. To this aim, I use the version 6.1 of the Penn World Tables, which provide a panel of annual observations for 168 countries during the period 1950-2000.[1] I focus on Purchasing-Power-Parity adjusted data on Gross Domestic Product (GDP) per capita. In spite of well-known limitations, these provide an estimate of the evolution of the material standards of living over time and across countries

The panel is unbalanced, since the time-series of many countries are incomplete. To reduce the extent of the problem, I exclude the countries which were formerly part of the Soviet block

[1] The dataset is available online from http://pwt.econ.upenn.edu/php_site/pwt_index.php)

from my sample, as data for them are only available for recent years. In addition, I only include observations after 1952 – the earliest year for which the data from China are available –, leaving a panel running from 1952 to 2000, and including up to 127 countries representing between 74% and 85% of the world population.[2]

I compute the population-weighted average GDP per capita growth for the world and for a subset of large geographical areas, weighting the annual growth rate of each country by its population size.[3] Keynes' forecast implies an upper bound growth rate about 2.1%. The population-weighted average growth rate over the half century in question is 2.9% per year, implying a 4-fold increase in the standards of living in just *fifty years* (recall that an increase by a factor of four was the lower bound of Keynes' prediction over a hundred-year horizon). If we project the 2.9% annual growth over one century, it corresponds to a 17-fold increase in the standards of living, i.e., more than double Keynes' upper bound. Clearly, the second half of the Twentieth Century has been an era of unprecedented material progress.[4]

There is no evidence, at the global level, that the engine of growth is losing steam. Quite the opposite, Figure 1 shows that (population-weighted) growth has accelerated in the last part of the century. What accounts for this performance? Figure 2 breaks growth down by large geographical areas. In the first panel, we compare OECD to non-OECD countries.[5] With an average growth rate over 4% (3.5%, if we exclude Japan), OECD countries grew significantly faster than non-OECD countries (2.2%) in the period 1950-1970. The situation was thereafter reversed, and in the period 1970-2000 OECD countries only grew at an annual 2.3% annually, while non-OECD grew at an annual 3.1% annually in the period 1970-2000. Thus, from a

[2]Since China accounts for almost one fourth of the world population, not having China in the dataset before 1952, and having it thereafter would affect significantly the estimate of the world average growth rate. In my estimates, China is always included.

[3]More precisely, the annual growth rate of the world (or of any subset of it) is the arithmetic average of the growth rates of all countries in the sample, where each observation is weighted by its population size (e.g., in year 2000, China has a weight of 0.24, while Switzerland has a weight of 0.0014). The five-year average is then constructed as an average of the relevant five annual observations.

[4]By construction, population-weighted average growth rates differ from the growth rate of the average GDP pc in the world. For example, suppose that the world consists of two countries with identical populations, A and B. Let A and B have, respectively, a GDP of 100 and 200. Suppose that the GDP doubles in A and remains constant in B (thus, the world GDP increases from 300 to 400). Then, the population-weighted average growth rate is 50%, whereas the world average GDP only grows 33%. The latter measure understates, relatively to the one I use, the performance of low-income countries.

Conceptually, my measure provides an answer the following question: what is the annual growth rate in an individual's standards of living, if she or he, behind the veil of ignorance, is dropped in a random country in 1950?

Interestingly, if one focuses on the alternative measure, the growth rate is 2.2%, which matches Keynes' forecast very closely.

[5]I regard Korea and Mexico as non-OECD countries as they only entered the organization in 1994 and 1996, respectively. The results are shown both with and without the inclusion of Japan, since Japan is a large country which was relatively poor in 1950 and had an exceptionally strong performance.

global perspective, the third quarter of the century was an age of divergence between rich and poor nations, while the last quarter was one of convergence.

Breaking down the economic performance into subareas within the developed and developing world is also interesting. Consider, first, the rich economies. The growth rate of income per capita was very high in Europe throughout the 1950s and 1960s, but then it suffered a slowdown (second panel). In contrast, North America (US and Canada) exhibits a less pronounced trend. In the 1990s, GDP per capita grew significantly faster in North America than in Europe. We will discuss later how changes in labor supply behavior are largely responsible for this divergence.

The development boom is mainly an Asian phenomenon (third panel). What Gunnar Myrdal described in the end of the 1960's as an "Asian drama" has to a large extent turned into an "Asian miracle". Strong economic performance was confined to East Asia in the third quarter of the century. But economic success later spread to the two Asian giants, India and China, whose exceptional growth in the last quarter of century accounts for a large share of the high world average. East Asia, in contrast, suffered some slowdown in the 1990's.[6]

Unfortunately, the rest of the developing world failed to record a comparable progress (last panel). The performance of Latin America was strong in the third quarter of the century (3.2% per year), but weakened considerably (1.1%) thereafter amidst repeated crises. The Middle East (including North Africa) followed a similar trajectory. Sub-Saharan Africa, finally, made no significant progress towards the solution of the "economic problem." Its average growth over half century was low, and the trend even more discouraging: during the 1980's and 1990's, the standards of living fell rather than improving. In 2000, the average GDP per capita of Sub-Saharan African countries was 1576 USD, slightly exceeding a mere 6% of the average GDP per capita in OECD economies. It would take a century of steady 3% annual growth for the average Sub-Saharan African country to attain the standards of living rich countries enjoy today.

In conclusion, mankind managed to attain, on average, major progress in the second half of the Twentieth Century, well above Keynes' optimistic expectations. However, the solution of the economic problem is still distant for a large share of its citizens. In 2000, the average GDP per capita among non-OECD countries (which represent more vast majority of the world population) still falls short of the GDP per capita of the US a century earlier. The tragedy of Sub-Saharan Africa remains as acute as ever, with AIDS, civil wars and political unrest

[6]The data of India are presented here jointly with Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka. Although none of these countries performed as strongly as India, the average regional performance is only marginally affected, as India is by far the largest country.

making miserable living conditions for the majority of its 600 million inhabitants. There are further unpleasant developments: within-country inequality has increased all over the world, making the increase of extreme poverty in the low-performing regions even more dramatic.[7]

Why do standards of living persistently remain so diverse? Part of the difference is due to capital accumulation. But, as a number of recent studies document, an even larger part is due technological differences (or differences in "total factor productivity"). Poor countries fail to adopt the more productive technologies that firms use in the industrialized world, or only do so with a significant delay. Explaining why the diffusion of ideas and technical improvements across the planet remains so slow is the subject of a long-standing debate. Institutional and political failures generating barriers to technology adoption are certainly an important factor.[8] In Acemoglu and Zilibotti (2001), we argue that, even if such barriers were absent, the process of innovation originating in the industrialized world may produce technologies which are "inappropriate" for the needs of the developing world, because of the complementarity of new technologies with human skills. Innovation in developed countries tend to develop new technologies which require skilled workers to be operated (see the IT revolution in the 1990s, for instance). The scarcity of highly educated workers limits the ability of poor economies to benefit from these technologies, inhibiting technological convergence.[9] The concurrent presence of growth-promoting institutions and high educational investment indeed seems to be the key of the success in South and East Asian economies.

2 More income or more leisure?

Keynes forecasted that a consequence of the material progress would be a reduction in the time people devote to working activities. He expected that, since consumption needs would be subject to some satiation, every person would only need to work about fifteen hours a week.

A strong trend towards the reduction of the worktime already existed before Keynes' time (see Marimon and Zilibotti, 2000). According to the estimates reported by Huberman and Minns (2005), the average annual number of hours worked per worker fell by almost 30% between 1870 and 1930, in both Europe and the US. The sharpest drop actually occurred in the three first decades of the Twentieth Century, so the trend must have made a strong

[7] For instance, Sala-i-Marti (2002) estimates that the number of people living with less than one USD per day in Africa has increased by 175 million between 1970 and 1998.

[8] See, e.g., Parente and Prescott (2002) and Acemoglu et al. (2006).

[9] In Acemoglu and Zilibotti (2001), we calibrate a growth model with endogenous technical change where the extent to which new technologies enhance the productivity of skilled and unskilled workers is also endogenous. The model can account for a large share of the empirical variation in cross-country total factor productivity differences.

impression on Keynes' contemporaries. After World War II, on the one hand, the number of hours per worker indeed fell further, but at a lower rate, and to a stronger degree in Europe than in the US. On the other hand, the female labor participation increased significantly, partially offsetting the decline in the number of hours worked by male workers. To date, the working week has not fallen to fifteen hours anywhere in the world, nor can we reasonably expect this to occur by the year 2030. A number of factors should, however, be taken into consideration in order to assess how much leisure people enjoy today.

First, worktime as a share of an individual's life has indeed fallen significantly. In 2000, life expectancy in Great Britain was about twenty years longer than it was in 1930 (seventeen in the US). Although part of this difference is due to lower infant mortality, the survival rates of adults are also significantly higher. For instance, the life expectancy of US white males at age twenty has increased by approximately ten years, and the increase is even larger for females and other ethnic groups. Likewise, the life expectancy of white males aged sixty also rose from fifteen to twenty years in the same period. In contrast, retirement age has fallen: the median retirement age for men in the US has fallen, again in the same period, from age seventy to age sixty-two (see Eisensee, 2006). This means that the fraction of an individual's lifetime spent on working activities is much smaller today than in 1930.

Consider the following back-of-the-envelope calculation. I construct a fictitious "Keynes' forecast" supposing that Keynes did not anticipate the changes in life expectancy, female participation rate and retirement age. In this scenario, an agent enters the labor force at fifteen, then works fifteen hours per week with probability 60% up to age sixty-five, then works fifteen hours with probability 30% up to age seventy, and then dies. Here, age seventy matches the life expectancy of a twenty-year old in 1930, while 60% and 30% are the share of employed people in the respective age group (see footnote below for more details).[10] I contrast "Keynes' forecast" with a "2000 real world" scenario, where an agent enters the labor force when fifteen, then works (in two alternative experiments matching, broadly the European and

[10] In 2000, the employment rate (i.e., the proportion of employed in the population 15-64) was about 70% in the Anglo-Saxon world (65% in the average OECD). As stated in the text, I construct the pseudo-"Keynes forecast" by ignoring the increase in the female participation rate and other changes in labor supply behavior. In 1930, the female participation rates in the US and UK were, respectively, 26% and 35%, while they amounted to 60% and 53%, respectively, in 2000 (see Costa, 2000). Since changes in the length of education and early retirement went in the opposite direction, I assume that Keynes underestimated the actual employment rate by 10% points (60% in "Keynes forecast" vs. 70% in the "2000 real world").

In addition, many elderly were working before the establishment of modern pension systems (for instance, about 40% of males above 65 were working in major OECD countries in 1950). For this reason, I assume in "Keynes forecast" that 30% of the population over sixty-five is at work. In contrast, no retiree is assumed to work in the "2000 real world".

I should also stress that my simple calculation assumes, for simplicity, a constant population age structure. See Ramey and Francis (2006) for a thorough discussion.

US experience) either thirty or thirty-eight hours per week with probability 70% up to age sixty-five, then lives as a retiree up to age eighty, and then dies.[11] In both cases, I assume agents to have at their disposal sixteen hours a day (with eight hours being devoted to sleeping), and I ignore the lifetime between birth and age fifteen.

The results are as follows. In "Keynes' forecast", the average individual works 7.6% of her/his lifetime endowment. In contrast, in the "2000 real world", she/he works 14.4% of her/his lifetime in the thirty hours workweek case, and 18.3% in the thirty-eight hours workweek case.

Second, Keynes expected affluence to free time for leisure. If we want to know how much time people can devote to enjoyment, we must subtract to the time available to humans not only the number of hours they work in the market, but also the time they spend in house-related work activity. I should stress up front that there is no consensus in the literature about the secular trend in housework. According to the estimates reported by Greenwood et al. (2005), housework per household in the US amounted to an average forty hours in 1930. A recent study by Achen and Stafford (2005) based on the Panel of Study of Income Dynamics (PSID) concludes that in 2001 this amounted (for married couples in the US) to 25 hours per week. Assuming that the data are comparable, more than one hour per person per day was freed from the yoke of housework. Such change has been made possible by labor-savings technical improvements in basic facilities and electrical appliances (running water, refrigerator, washer, vacuum, etc.). Not all the time saved at home has been devoted to leisure, though, and the study of Greenwood et al. (2005) attributes an increase of about 28% points in the female labor supply between 1900 and 1980 to the technological revolution in the household sector.[12]

Third, people spend today a larger share of their lifetime on education activities. Ramey and Francis (2006) report that the annual per capita hours in a cross-section of the US population spent on school went up from six hundred to nine hundred in the period 1970-2000. How should we regard this educational activity? I suspect that Keynes would count it as part of the benefits of mankind's liberation from the necessity of material production. But if one takes the pessimistic view that educational effort is as painful as working in a mine, one may

[11] European employed workers (including both full-time and part-time) worked in 2000 an average 30-33 hours per week, and enjoy ca. thirty–five days of holidays and vacation. In the US, the corresponding figure is 38 hours, and with ca. twenty days of holidays and vacation.

[12] Ramey and Francis (2006) criticize the data of Greenwood et al. (2005). According to their evidence, housework per capita, somewhat surprisingly, did not fall, and even increased in the US in the period 1900-2000. Their study reports that housewives did over fifty hours housework per week around 1930s (see p. 16 and Figure 8). This is double the housework done by American couples in the PSID in 2001 according to the study of Achen and Stafford (2005).

want to account the increase in education as an offsetting factor in the secular reduction of worktime.

In summary, people work for a smaller fraction of their lives today than in 1930. I also believe that people enjoy more leisure, although I acknowledge that there is less consensus on this point. Equally important, technical progress has had important effects on the quality of worktime and leisure opportunities. Working conditions are better and more salubrious. And if, to put it like Keynes, "three hours a day is quite enough to satisfy the old Adam in most of us", entering the labor market had some positive implications for Eve. Labor participation and the possibility of developing a career have been vehicles of female emancipation. Finally, technical progress has increased the variety of leisure goods and reduced the time which is necessary for performing many leisure activities (e.g., progress in transportation facilities makes it possible to travel more extensively and in a shorter time).

I would like also to comment on the evolution of labor supply over the last thirty years. European and Americans seem to have developed different tastes about how to enjoy technical progress. Europeans have decided – perhaps following Keynes' inclination – to enjoy more leisure, while Americans work longer hours. More precisely, back in the mid-1970's Britons, Germans and Frenchmen worked on average 5-10% more than Americans. At the turn of the century, however, they only work 70-75% of their American counterparts (see, Prescott, 2004, Table 1).[13] As a matter of fact, while the GDP per capita has grown faster in the US than in Europe, the opposite is true when one looks at output per hour worked. GDP per hour has increased by 38% In the US between 1970 and 2000, while GDP per hour in France rose by 83% in the same period.[14] Germany and other continental European countries also behaved much like France. This is almost entirely due to the contrasting labor supply behavior. What can explain this difference? According to Prescott (2004), the key is cross-country differences in the distortionary effects of labor income tax. Blanchard (2004) offers a less pessimistic view: Europeans may be choosing a more balanced allocation of the productivity gains between increasing income and leisure. Whether as a matter of taste or as the effect of policies (that are in any case the outcome of democratic processes), Europeans seem to be moving in the direction Keynes suggested. Whether further movements in this direction are feasible is unclear, however, especially since the demographic trend is increasing over time the proportion of retirees in the population, and worktime reductions in the active population may

[13]The data in the text, borrowed from Prescott's study, detail hours worked per person aged 15-64. Thus, they include people who are unemployed or out of the labor force. If instead we look at weekly hours per worker in 2000, they were thirty-eight in the US, thirty-three in the UK, and between thirty and thirty-two in Continental Europe.

[14]Here, the example and figures are from Blanchard (2004)

jeopardize the sustainability of the pension system.

Why do we work more hours than forecasted by Keynes? I must start by saying that economic theory offers no compelling reason for technical progress to make people work less. Textbook economics teach us that as productivity grows, income and substitution effect work in opposite directions: as we get richer, we demand more leisure (income effect), but its opportunity cost also increases (substitution effect). With standard preferences, the net effect can go either way.

However, Keynes proposed a more sophisticated argument that goes beyond the simple trade-off between labor and leisure. He argues that some evolutionary process (or learning) affects the intensity with which people are capable of enjoying leisure or tolerating labor effort. The ability to appreciate leisure would depend on some acquired taste and, possibly, on complementary investments increasing the ability to appreciate specific leisure activities. For instance, it takes time, effort and devotion to become capable to appreciate literature or classical music. According to Keynes, the secular slavery of economic necessity selected human preferences involving a high tolerance of labor effort and some limited ability to appreciate good life. Keynes anticipated that the progressive satiation of material needs would naturally generate a shift of preferences, whereby people would become better at appreciating arts and beauty. Moral values would also change, and the obsession for money-making would be replaced by a new humanism.

Interestingly, the recent economic literature on "endogenous preferences" echoes this view. For instance, we use a similar – if somewhat opposite – argument in Doepke and Zilibotti (2005 and 2006) to explain the decline of the aristocratic elite at the outset of the British industrial revolution. We argue that the pre-industrial elite, accustomed as it was to rearing its children in the devotion to arts, pleasures and a variety of leisure-oriented activities (from classical music to fox hunting), developed a sense of disdain for hard work and a low propensity to save and invest. The urban middle-class, in contrast, was reared in the values of thriftiness and perseverance which were most important in the life experience of artisans and traders. For this reason, the latter developed a "capitalist spirit" that, as emphasized in the celebrated work of Max Weber, became a major advantage once new opportunities arose with the Industrial Revolution. This can explain the triumph of the bourgeoisie and the demise of the aristocracy during the Industrial Revolution.

Keynes' argument goes one step further in time. He argues that when economic needs are satiated, a reversal will occur, and the appreciation of arts and leisure will again become the evolutionary successful trait. Can we see evidence of the change predicted by Keynes? Hardly,

in my view. The growing phenomenon of obesity is an emblematic sign of the quantitative (as opposed to qualitative) nature of people's consumption habits. Another is the growing pressure for downsizing the provision of public goods such as health services, green areas, or elderly care that affect people's daily quality of life. The return to these savings is yet more private consumption, in a society where private opulence risks being coupled with public poverty. Markets seem to have been proven capable of supplying an amazing quantity and variety of leisure goods that require more money than time to be enjoyed. These goods are strong competitors for traditional cultural consumption goods requiring lengthy training and education towards their appreciation. But the last word may have not been said, and we may just be learning to appreciate of good life too slowly.

3 Conclusion

Did Keynes' optimism prove warranted? His expectations about improvements in the material conditions of mankind were correct. Indeed, material progress has led to extraordinary expansion of the opportunities which we can today enjoy. Keynes' forecasts about the cultural implications of growth are more problematic, and material needs do not show any clear tendency of becoming satiated.

Material progress continues, however, to be the primary problem for large parts of the world, especially for the 600 million people who continue to live in conditions of extreme poverty. Hopefully, growth will continue to be contagious in the developing world. Furthermore, I do not expect that productivity growth and technical change will slowdown in industrialized economies, although future generations may decide to enjoy the fruit of the technical progress in different ways, including shorter worktime.

However, growth is not just about good news. I see the environmental sustainability as a major unresolved question. I cannot subscribe to the optimism of many economists in this respect. There are neither effective self-correcting nor, to date, institutional mechanisms that can prevent a "tragedy of the commons" on a global scale. We can hope that technical progress will take a stronger move in the natural resource-saving direction. But this will not come through the invisible hand. It will instead hinge on a strong political will to constrain and make more expensive the use and abuse of natural resources as well as the emission of pollutants. However, the action of special interest groups in some rich countries is blocking these necessary interventions on the one hand; on the other hand, environmental issues remain a luxury good for countries striving to solve their "economic problem." If these countries decide to use natural resources as intensively as the first industrializers, the environmental effects

might be dramatic. The only hope for success involves rich countries inducing poorer countries, through their financial and technical support and via incentive-compatible mechanisms, to adopt environmentally-friendly technologies. The set of current international institutions is far too underdeveloped to tackle this issue. The risk of a global failure is, in my view, severe.

References

[1] Acemoglu, Daron, Philippe Aghion and Fabrizio Zilibotti (2006), "Distance to Frontier, Selection and Economic Growth," *Journal of the European Economic Association*, 4, 37-74.

[2] Acemoglu, Daron, and Zilibotti, Fabrizio (2001), "Productivity Differences," *Quarterly Journal of Economics*, 116, 536-606.

[3] Achen, Alexandra C., and Frank P. Stafford (2005), "Data Quality of Housework Hours in the Panel Study of Income Dynamics: Who Really Does the Dishes?", Mimeo, University of Michigan.

[4] Blanchard, Olivier J. (2004), "Is Europe Falling Behind", *The Globalist*, June 8 2004 Issue.

[5] Costa, Dora (2000) "From Mill Town to Board Room: The Rise of Women's Paid Labor." *Journal of Economic Perspectives*. 14 (Fall), 101-122.

[6] Doepke, Matthias, and Fabrizio Zilibotti (2005), "Social Class and the Spirit of Capitalism", *Journal of the European Economic Association*, 3, 516-24.

[7] Doepke, Matthias, and Fabrizio Zilibotti (2006), "Patience Capital, Occupational Choice and the Spirit of Capitalism", Mimeo, IIES-Stockholm University.

[8] Eisensee, Thomas (2006), "Fiscal Policy and Retirement in the Twentieth Century" Mimeo, IIES-Stockholm University.

[9] Ramey, Valerie and Neville Francis (2006), "A Century of Work and Leisure" Mimeo, UC San Diego and University of North Carolina.

[10] Greenwood, Jeremy, Ananth Seshadri and Mehmet Yourukoglu (2005), "Engines of Liberation," *Review of Economic Studies*, 72, 109-33.

[11] Huberman, Michael and Chris Minns, "Hours of Work in Old and New Worlds: The Long View, 1870-2000," Mimeo, Université de Montréal

[12] Marimon, Ramon, and Fabrizio Zilibotti (2000), "Employment and distributional effects of restricting working time", *European Economic Review*, 44, 1291-1326.

[13] Myrdal, Gunnar (1968), *Asian drama; an inquiry into the poverty of nations,* Pantheon Books, New York.

[14] Parente, Steve and Edward Prescott (2002), *Barriers to Riches,* MIT Press.

[15] Prescott, Edward (2004), "Why Do Americans Work So Much More Than Europeans," *Federal Reserve Bank of Minneapolis Quarterly Review*, 28, 2-14.

[16] Sala-i-Martin, Xavier (2002), "The World Distribution of Income (estimated from Individual Country Distributions)", NBER Working Paper No. 8933.