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WORK AND CONSUMPTION IN AN ERA OF UNBALANCED TECHNOLOGICAL ADVANCE

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ABSTRACT

Keynes's "Grandchildren" essay famously predicted both a rapid increase in productivity and a sharp shrinkage of the workweek – to fifteen hours – over the century from 1930. Keynes was right (so far) about output per capita, but wrong about the workweek. The key reason is that he failed to allow for changing distribution. With widening inequality, median income (and therefore the income of most families) has risen, and is now rising, much more slowly than he anticipated. The failure of the workweek to shrink as he predicted follows. Other factors, including habit formation, socially induced consumption preferences, and network effects are part of the story too. Combining the analysis of Keynes, Meade and Galbraith suggests a way forward for economic policy under the prevailing circumstances.

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1. Introduction

Most of John Maynard Keynes's economic writings addressed phenomena that worked themselves out (or not, in the case of a depressed economy's ability to regain full employment without fiscal stimulus) over limited time spans. As Keynes famously remarked, "in the long run we are all dead." It is ironic, then, that what has today become his most widely discussed individual essay – his "Economic Possibilities for our Grandchildren" – focused on a distinctly longer horizon: one hundred years.[1] In this paper Keynes laid out his expectations for how consumption and work would evolve over the coming century, and he went on to speculate on the social and moral consequences that would ensue. What he predicted has, in part, turned out to be remarkably accurate so far. In other respects his image of the future was far wide of the mark. The contrast, together with the reasons for it, is highly relevant to our own prospects today.

What Keynes got right was the continuing advance of economic productivity, in the standard sense of the economy's ability to generate ever more output from any given amount of labor and capital and other resources, and therefore the continuing increase in the quantity of goods and services produced per person in the population. Although today most citizens of the Western world probably think of unending economic growth resulting from technical progress as simply a matter of course, not long before Keynes's day this was not thought to be so. Judged by the available historical record, there was little improvement in average Western living standards over the two thousand or so years prior to the onset of the Industrial Revolution. Adam Smith, who died in 1790, still thought that increased productivity came only from increased specialization in production, not from technological advance (and Smith wrote at some length about what society should therefore do to offset what saw as the deleterious effect of ever greater

"division of labor"). As late as the first quarter of the nineteenth century, prominent political economists like Malthus and Ricardo failed to grasp the implications of ongoing technological change. Not until the 1830s was it clear that the improvement in living standards increasingly evident in Britain and America, and some other countries too, was more than just the upswing of the latest "long wave."[2]

But by 1930, when Keynes published his "Grandchildren" essay, the ongoing technologically driven advance of productivity, and with it the ongoing improvement in general living standards, was widely understood. Even so, projecting its continuation for another hundred years was bold. "I would predict," Keynes wrote, "that the standard of life in progressive countries one hundred years hence will be between four and eight times as high as it is today" (pp. 325-326).[3] For the United States – see Figure 1 – his prediction was perhaps even not optimistic enough.[4] Until the 2007-9 financial crisis, U.S. per capita output was on a trajectory to reach a level in 2029 more than nine times as high as in 1929 (the last data point Keynes would have had). Even after the downturn triggered by the crisis, the U.S. economy is today right on track to reach Keynes's eight-fold multiple.

By contrast, Keynes badly misconstrued how citizens of these "progressive countries" would choose to enjoy the fruits of their economies' ever-increasing productivity. With greater productivity, people on average can consume more than before without needing to work more, or they can work less than before without having to consume any less. Or they can do some of both: consuming more while working less. When Keynes wrote, the historical record since the Industrial Revolution was strongly consistent with "some of both," and that is what he predicted would follow. He was even quite specific on the matter, concluding that "a quarter of the human

effort to which we have become accustomed" would suffice, and envisioning "three-hour shifts or a fifteen-hour week" (p. 325, 329).

Although perhaps overly ebullient, Keynes's prediction for the path of per-person labor input between 1929 and 2029 was roughly consistent with the pattern of the prior hundred years. From 69 hours in 1830, the average workweek for Americans doing what was considered "full time" work had fallen to 47 hours by 1930 – see Figure 2 – even as U.S. per capita production, and therefore living standards, rose dramatically.[5] And, in the first four decades after Keynes wrote, the workweek indeed continued to shrink at nearly the same rate. By 1970, Americans on average were working not quite 39 hours per week.

So confident was Keynes about the matter that the principal thrust of his "Grandchildren" argument concerned not *whether* the workweek would continue to decline, but what the human consequences would be. He found them serious and challenging. Keynes wrote that he thought "with dread of the readjustment of the habits and instincts of the ordinary man, bred into him for countless generations, which he may be asked to discard within a few decades" (p. 327). The central challenge to be presented by ever greater productivity was the need "to devote our further energies to non-economic purposes" (p. 326). Man's "real, his permanent problem" would be "how to occupy the leisure, which science and compound interest [Keynes's way of thinking about ongoing productivity improvement] will have won for him." It would be, he concluded, "a fearful problem for the ordinary person" (p. 328).

That part of Keynes's prediction has turned out to be wrong; or at least it is on hold, and it seems highly unlikely to come true by 2029. After adjustment for the ups and downs of the business cycle, the American workweek has now remained approximately unchanged for more than four decades. In 2007, just before the onset of the recession triggered by the financial crisis,

the average American worker put in 39.2 hours on the job, slightly up from a then-recessionary low of 38.0 hours in 1982. During the post-crisis recession, as involuntary part-time work became more prevalent, the average workweek fell to an all-time low of 37.9 hours. By 2012 it had recovered to 38.5 hours, identical to what it was in 1980.

Section 2 examines more closely why, and when, the evolution of work departed from Keynes's expectation. As Section 3 goes on to argue, the explanation is that Keynes has actually turned out to be wrong about living standards too – at least the aspect of living standards that matter for the ideas about work and consumption that he advanced in his "Grandchildren" essay. Section 4 discusses a further dimension of the interaction between work and consumption that Keynes certainly did take into account: the role of habit and social relations in determining preferences. Section 5 looks forward, focusing on the prospect of what Keynes called "technological unemployment" (p. 325), albeit now in a different context from what he anticipated. Section 6 suggests a potential solution, though to be sure only a partial one, for this problem in the form of increased production of public goods. Section 7 concludes.

2. Why Was Keynes Wrong about Work?

Where did Keynes's thinking go wrong? How could he be strikingly right in one dimension of economic activity – output consumed – but so wrong about another – labor input – when standard economic theory relates the two in such a straightforward way? Further, why did economic behavior in the first of these dimensions continue along the path it had followed since the Industrial Revolution, while in the second it did so until the 1970s but then marked a distinct departure?

Several potential explanations suggest themselves. To begin, as Keynes recognized, conventions of human behavior, and the social and political institutions to which they give rise,

change slowly. Part of the problem he foresaw in the "Grandchildren" essay was precisely the need to redirect human values away from the emphasis on achieving economic ends, as these became easier to fulfill and hence demanded less effort and therefore became less worthy of attention. But this argument is, at best, far from sufficient. Why would society's presumptions and arrangements surrounding work have exhibited enough flexibility to accommodate a decline in the workweek from nearly 70 hours to little more than half that, but then no farther? Or, to put the matter in terms of the calendar, why would these institutions have suddenly become inflexible only in the 1970s? As is often the case, pointing to social conventions is rarely an answer to any substantive question; at most, it helps organize ways of reaching toward an answer.

A second potential explanation, to be taken more seriously, is that the character of work changed. Economists' standard model posits that consumption provides positive utility (perhaps diminishing at the margin, but still with positive sign), while working generates disutility (perhaps increasing at the margin). But the assumed disutility of labor surely depends on the conditions under which people work, and these have changed enormously over time.[6] In 1870 a quarter of American workers were farmers and another fifth were non-owner farm laborers. Today both together represent barely 1 percent of the U.S. labor force. The change matters because farm work is physically arduous and accident-prone, is typically performed in isolated settings providing little social engagement, and is subject to the extremes of weather. Blue-collar laborers (as distinct from craftsmen) have likewise diminished from nearly a tenth of the labor force in 1870 (and about the same percentage as recently as 1940) to barely 1 percent today. Maids, laundresses and other domestic servants have diminished from 8 percent of the labor force to less than 1 percent over the same period. Fully three-fifths of the work force, for whom

the assumed disutility of labor once required no further explanation, is now doing something else.[7]

What, then, are all the workers doing? More than a third of all American workers are now either professionals or managers, in contrast to less than 5 percent in 1870 (and still only 11 percent in 1940). And more than two-fifths work in service-sector jobs other than domestic service – clerical workers, salesmen and -women, and other service jobs – also compared to less than 5 percent in 1970. To be sure, not all clerical or sales jobs are enjoyable; nor, for that matter, is all professional and managerial work. More than fifty years ago Sloan Wilson's best-selling novel (and then the film featuring Gregory Peck) portrayed the frustrations of the "man in the gray flannel suit." Today's newspapers are filled with stories of "the ennui of the cubical" and the hardships of life on the front lines of a Walmart or a Starbucks. But compared to the back-breaking physical labor of plowing and digging and hefting equipment, and the risk of losing an arm or becoming crippled in some industrial accident, these unpleasantnesses appear mild. And even for work that has continued to be done in factories and slaughterhouses and steel mills, over time successive waves of occupational safety legislation have reduced the risks and ameliorated the noxious environment. Even something as simple as the reduced need to clean up ubiquitous manure, once cars and trucks and buses replaced horse-drawn transportation, surely reduced the disutility of work for a substantial segment of the workforce.

Here too, however, the abruptness of the halt in the century-plus shortening of the workweek calls for more explanation than these influences are able to provide without significant further elaboration. The movement of the American labor force from farms and messy and dangerous factory floors to offices and cubicles was well in progress long before the 1970s.

A further possible explanation is that, in an era of ever fewer settings that provide effective opportunities for personal connections and relationships – a phenomenon famously documented for the United States by Robert Putnam (2000) – the workplace may have, by default, assumed greater importance in ways not immediately suggested by the concept of "labor." Many Americans now derive much of their sense of self, not to mention their identity as seen by others, from their work rather than their church or club or pastime. Many define their social circles by who sits in the next office, not in the next pew. But the evidence on Americans' transference of their social connections to the workplace remains uneven at best,[8] and without more chronologically detailed evidence its bearing on the abrupt change in trend in the U.S. workweek in the 1970s is far from established.

3. Was Keynes Wrong about Living Standards Too?

A very different explanation arises from the fact that, on closer inspection, the first part of Keynes's prediction was perhaps not as accurate as it may seem after all. To recall, Keynes predicted a four- to eight-fold increase over the coming hundred years, for countries like America and Britain, in what he called "the standard of life" (p. 325), and when he went on to discuss the implications he foresaw he assumed an eight-fold multiple. But he did not specify what "the standard of life" meant. Per capita output – see again Figure 1 – has indeed grown at that pace, on average, since he wrote. As the recent public discussion has increasingly emphasized, however, for some time now most Americans' incomes, and therefore what most Americans consume, have not increased as rapidly as U.S. per capita output.

One reason is simply that larger shares of output are going to uses that do not visibly contribute to living standards. At the most basic level, as the U.S. economy has become more capital intensive, and as the composition of its capital has progressively shifted away from long-

lived plant toward shorter-lived equipment, the share of total output required merely to replace what is either wearing out or becoming obsolete – in other words, the difference between gross product and net product – has increased. In 1929 depreciation of all kinds of capital, whether owned by businesses or households or government at all levels, amounted to slightly less than 10 percent of U.S. gross domestic product. In 2013 it was just under 16 percent. Compared with when Keynes wrote, therefore, an additional six percent of the economy's output (whether measured in total or per capita) is not available for either current consumption or net increases in capital stock to raise the future trajectory of consumption.

Another four percent has gone into defense spending. In 1929 the federal government's purchases of goods and services for the military totaled just under one percent of total output. Defense spending is now somewhat under five percent of output (and, at some points in between – especially the 1960s and 1970s – it was much higher than that). To be sure, national security is a crucial underpinning of any country's "standard of life." But the output devoted to making weapons and tanks and airplanes for the military is not part of the population's living standard construed in the usual way, nor are the services provided by uniformed soldiers and seamen and airmen.

The quantitatively most important reason most Americans' incomes and consumption have increased far more slowly than U.S. output per capita is that, ever since the 1960s, individuals' personal shares of the nationwide aggregate have become less equal. The phenomenon is not limited to the United States; income inequality has widened in practically all of what Keynes considered the "progressive countries." When inequality becomes greater, the median of a rising distribution increases less rapidly than the mean, so that even if the fraction of

aggregate income devoted to consumption remains unchanged, more than half of the population experiences a slower growth in living standard than what the growth of per capita output implies.

In the United States the difference has been substantial. U.S. data on median incomes are not available prior to 1947, and so it is impossible (without inferring the median from other data, which would expose the exercise to methodological questions of a different kind) to evaluate Keynes's prediction over the first eighteen years of his intended hundred-year horizon. But for the 65-year span from 1947 to 2012 (the most recent available data) – see Figure 3 – it is clear that Keynes was *over*-optimistic if one construes "the standard of life" as the median rather than the mean.[9] Extrapolated to a hundred years, the realized growth rate of the U.S. median family income over 1947-2012 would produce a multiple of just over 3 ½, modestly below the low end of Keynes's projected increase (and well below the trajectory of per capita output).[10]

Moreover, the growth of U.S. median income exhibits a distinct slowing in the early 1970s, roughly coincident with the leveling off of the average workweek. From the beginning of the series in 1947 (the local peak preceding the 1948-9 "inventory recession") to 1973 (the local peak preceding the "OPEC recession"), the median family's income grew in real terms at 2.8 percent per annum – far in excess of the rate needed to deliver an eight-fold multiple over a hundred years. By contrast, from 1973 to the present real median income has grown by just 0.3 percent per annum, not even enough for a doubling in a hundred years (the projected 100-year multiple at that rate is merely 1.3).[11]

The origins of this slowing of family income growth are clear enough: the dramatic reversal in the trajectory of real wages for the majority of American workers. Between 1947 and 1973 the average hourly wage for nonsupervisory workers in private industries other than agriculture (restated in 2013 dollars) nearly doubled, from $12.27 to $21.23 – an average growth

rate of 2.1 percent per annum. But by 2013 the average hourly wage was only $20.13 – a 5 percent *fall* from the 1973 level. Despite an increase in two-earner families, therefore, the median family income *declined*.[12]

This sharp difference between the pre- and post-1973 growth rates – for either family incomes or wages – is not merely an artifact of the 2007-9 financial crisis. During the post-crisis recession the median family's income did fall more in percentage terms than per capita output, and as late as 2012 there was still no sign of recovery; median income in 2012 stood more than 8 percent below the 2007 peak. But even without the post-crisis decline, the slowdown compared to 1947-73 was major. In contrast to 2.8 percent per annum growth from 1947 to 1973, the growth from 1973 to 2007 (not just a local peak but, as of the time of writing, the record high) was just 0.6 percent per annum – again implying not even a doubling (a multiple of 1.8) if extrapolated for a hundred years.

The reasons for widening inequality are many and varied, and the empirical research needed to assign weights to the different factors involved (most of the posited explanations are not mutually exclusive) remains unfinished. Most economists have placed greatest emphasis on the changing technology of production, which attaches increased value in the labor market to some sets of skills and reduced value to others.[13] Another explanation that has received widespread attention, more in the popular press than among economists, is the ongoing internationalization of markets for not only goods but, increasingly, services too (itself a consequence of advancing technology) – so that an ever larger fraction of workers in the highly developed economies face competition from those in countries where wages are low compared to their own. Some further suggested causes of widening inequality are more specific to the United States: the skill-biased composition of U.S. immigration, which exposes low-wage workers to

even more competition; the declining real value of the federally mandated minimum wage; and declining American union membership. Because inequality is increasing in all of the major industrialized economies, however, and in much of the developing world as well, the common working presumption among most economists is that country-specific institutional features are unlikely to bulk large in the overall story.

Finally, in addition to widening wage inequality, with its array of potential explanations, within the past two decades the functional composition of income has been shifting. In most of the advanced economies, income earned from providing labor has been shrinking as a share of all income earned, while income earned from owning capital has correspondingly increased.[14] Given the highly unequal ownership of capital, this shift in functional shares results in an increasingly unequal distribution of incomes overall. (This phenomenon, which stands quite apart from wider wage inequality, is at the heart of Thomas Piketty's (2014) argument that has received so much public attention).

Widening inequality of incomes, of course, need not imply widening inequality of consumption. Most obviously, as Keynes himself later emphasized (in a quite different context) in the *General Theory*, those with higher incomes normally save more. The bearing of this distinction on Keynes's argument in the "Grandchildren" essay is not straight forward, however. Especially in an economy like that of the United States, where the great majority of the population significantly under-saves for retirement,[15] people's inability to provide adequately for their future consumption surely matters for their current sense of material well-being – which is what Keynes thought would lead to dramatically reduced work effort. Consumption inequality plausibly has increased less than income inequality also because of reliance on publicly provided in-kind goods and services like food or shelter or medical care.[16] But even on its own terms, the

difference between the trends in inequality of income and of consumption turns out to be less important than one might think. Although some work on this question using direct expenditure data has emphasized the difference – a greater increase in inequality of income than of consumption[17] – more recent research for the United States by Attanasio et al. (2012) and Aguiar and Bils (2013) concludes that "consumption inequality has tracked income inequality much more closely than estimated by direct responses on expenditures."[18]

It is also possible to argue that consumption today is not directly comparable to consumption in prior years, especially in light of the far greater variety of choice confronting today's consumers.[19] (A familiar classroom exercise is to show students the 1902 Sears Roebuck catalog, which is available in an inexpensive reprint, and ask them to choose between a specified amount of money that they could spend only on selections from the catalog and some lesser amount, adjusted for inflation since 1902, that they could spend on whatever they choose from what is available today.[20]) Presumably variety and choice do matter. But for increasing variety and choice to negate the effect of the much slower growth of income and consumption for purposes of Keynes's incorrectly thinking that work effort would continue to decrease, it would have to be the case that the increase in variety and choice has accelerated in recent years, just as the growth of incomes and consumption for the majority of families has slowed. No one has made this case.

In sum, with widening income inequality in recent decades the failure of either the incomes or the consumption of most American families to keep up with the growth of U.S. output per capita bears directly on the initial accuracy but subsequent failure of Keynes's prediction for work. Until the 1970s, Keynes was right on both fronts: per capita output grew at the upper end of the range he predicted, most families' incomes grew even faster (inequality was

mostly narrowing during that period), and the workweek continued to decline. But with widening inequality from the early 1970s on, the growth of most families' incomes became far slower than he had predicted, and the workweek stopped declining. The latter combination has persisted ever since.

4. The Role of "Non-Standard" Preferences

From the perspective of the standard economic model, with positive utility from consumption and disutility of labor, one might still expect that the workweek might have continued to decline after 1970, just not as rapidly. After all, despite the adverse shift in distribution, up to 2007 the median family income (and therefore the incomes of the majority of families) did continue to experience some modest increase. Under the standard substitutability and convexity assumptions, the typical individual would have chosen to apply at least some part of that increase toward eliminating the disutility of work. (Moreover, as women's participation in the paid labor force increased, the average workweek overall might have shortened on yet other grounds.)

As Keynes was well aware, however, influences not encompassed within the standard utility model readily account for why people with only modestly growing incomes would choose to consume more and also work more. Economists since Adam Smith have well understood the role of habit formation in shaping consumption preferences. Given any existing level of economy-wide consumption, a modestly higher level does generate increased utility – for a while. But in time the novelty erodes (one can think of the novelty either in terms of total consumption or as utility from new goods), and to achieve again the higher level of utility associated with the earlier increase, yet a further increase is required. Keynes of course knew the thinking along these lines by Smith, Mill, Marshall and others. Further work since his time has

formalized the character of the preferences involved, and produced extensive empirical verification, but the basic idea remains the same.[21]

Keynes was also well aware of the role of socially determined consumption preferences. This insight had likewise been explicit in Smith's writings, and within Keynes's lifetime Veblen had popularized the idea. In his "Grandchildren" essay, Keynes similarly distinguished "those needs which are absolute in the sense that we feel them whatever the situation of our fellow human beings may be" from "those which are relative in the sense that we feel them only if their satisfaction lifts us above, makes us feel superior to, our fellows." He even anticipated the class of wants that later thinkers like Fred Hirsch (1976) formalized as "positional goods," going on to argue that "needs of the second class, those which satisfy the desire for superiority, may be insatiable" (p. 326).

A further spur to consumption demand (at the expense of leisure) that seems especially relevant over a century-long time horizon, but that Keynes may not have taken into account, is the role of network effects in creating new preferences. As he not only anticipated but emphasized, the technology of everyday life has changed dramatically since 1930. People are free to take advantage of many of those changes, or not, as they choose. Whether to own a dishwasher in one's house or apartment, for example, is a matter of individual choice. Other technological changes, however, create networks that most people bear significant cost to refrain from joining. When Keynes was born, there were no telephones. By 1930, nearly half of U.S. households had them. Today in the United Sates residential or cellular telephone ownership is nearly universal.[22] Not to have one means cutting oneself off from the society's commonly accepted communication system. Because of network effects, a good that was a luxury when first introduced has become a necessity. Today the transition to a computer-based

communication network is likewise already well in place. Nor is communication the only area in which such network effects regularly occur. In Keynes's youth, owning an automobile was a luxury, and in some countries it still is. But in countries like America and Britain, once cities grew up along configurations based on the assumption of readily available transport by car, for people living in those cities owning one became a necessity.

Especially with the addition of influences on consumption preferences due to habit formation, social comparison, and network effects, the sharp slowing in the median family's income beginning in the 1970s seems persuasive as an explanation for the simultaneous reversal of what had been, for at least a century and a half, a declining workweek. As standard theory suggests, consumption and labor input are indeed related. Keynes's error in predicting the path of labor input looks to be largely a reflection of what, on closer inspection, turns out to have been his error in predicting the path of income and therefore consumption.

5. Technological Unemployment

Keynes's predictions for the workweek, and for the living standard of the median family (if that is what the "standard of life" was supposed to mean) have not been realized. But there is a different rendering of what he foresaw in his "Grandchildren" essay that looks more likely to come about, perhaps even by 2029.

Keynes wrote in his essay of "technological unemployment," which he defined as "unemployment due to our discovery of means of economizing the use of labor outrunning the pace at which we can find new uses for labor" (p. 325). He went on, as we have seen, to picture the form this phenomenon would take as fewer hours on the job for the typical worker: "three-hour shifts or a fifteen-hour week." That is not what has happened. But an alternative construction of what technological unemployment might mean is no job at all – or at least no

worthwhile job – for an increasing number of able-bodied and -minded citizens, while others continue to work, with ample pay, for whatever the society construes as the normal number of hours.

Replacing human work with that of machines has been a continual theme in Western economic thinking – and in Western culture more broadly, sometimes as a concern and sometimes as an aspiration – at least since the Industrial Revolution. So far, the resulting fears of widespread labor idleness, however, have not been realized. Technological advances have reduced the need for some forms of labor input, thereby freeing up the economy's human resources for other applications, often including new applications likewise opened up by new technology. On net, labor input per person has gone down (as it did until the 1970s) or remained steady (as it approximately has since then), while consumption has increased. Implicit in the standard account of this process is that new applications for labor emerge, at least on a pace with the technologically induced elimination of demand for labor in others. The invention of the automobile mostly eliminated the jobs of saddlers and stable boys, but it created new jobs for auto workers, mechanics and gas station attendants.

Keynes predicted that the race between technology freeing labor and new applications (themselves perhaps technologically based) emerging would become lop-sided, with resulting further decrease in labor input per person. But here too, his argument neglected distributional considerations. Just as he implicitly assumed that the increase he foresaw in per capita output would carry over to the living standard of the typical family, he assumed (in this case more explicitly) that the reduction in labor input per person would be somewhat evenly spread throughout the workforce – hence the three-hour shifts and fifteen-hour weeks.

By contrast, other observers of the economy's ongoing technological advance have suspected that the workforce would experience shrunken labor demand in a lumpier way. James Meade (1965), writing a third of a century later, envisioned a world in which "the proportion of the working population [importantly, the proportion of the population, *not* the proportion of the typical worker's time] required to man the extremely profitable automated industries would be small" (p. 33). And what would the rest of the working-age population do? With adequately high wage rates, each individual would be able to work only a limited number of hours per week – as Keynes had predicted – so that the reduced labor demand would, in effect, be shared across the population. Keynes clearly thought wages would be high enough that putting in fewer hours would still give workers an adequate income to support an ample living standard. But with labor demand so far reduced, what would keep wages high?

Meade instead thought "wages would thus be depressed" (p. 33), as ever less labor was necessary for production. Correspondingly, an ever greater share of total income would go to the owners of the machines. In the absence of government-provided welfare on a massive scale, therefore, most of the workforce would be compelled to take whatever low-paying jobs they could get, presumably in the service of the machine-owners but not working with the machines. In Meade's vision, "we would be back in a super-world of an immiserized proletariat of butlers, footmen, kitchen maids, and other hangers-on" (p. 33). In today's American context a half-century later, one might substitute gardeners, swimming pool attendants, personal trainers and home nurses.

Two further influences at work today, foreseen by neither Keynes nor Meade (at least not in making this argument), threaten to make the situation even worse in countries like the United States. First, advances in communication technology are opening an ever wider array of not just

goods but also services to international trade. The mere displacement of workers from goods-producing industries does not, per se, necessarily cause a reduction in overall labor input. The result, historically, has been the movement of employment into the service sector. But today the "off-shoring" of jobs from high-wage economies like that of the United States is no longer a matter of goods-producing industries only. Nor are the only service jobs to be off-shored low-wage activities like staffing call centers. Computer programming, reading X-rays, preparing tax returns, carrying out legal research – all are traditionally higher-wage professions, and today each can be, and increasingly is, performed for U.S.-resident customers outside the United States.

And second, even for many of the lower-wage jobs that must be done on site – again, the gardeners and swimming pool attendants – a steady flow of (mostly illegal) immigrants is available to do such work at wages that most Americans would find unacceptable. Wholly apart from the question of whether these jobs would offer significantly higher wages if immigrant workers were not there to take them, the point is that even the production that must be carried out in the United States if it is to be consumed by Americans nonetheless often does not present employment opportunities for American workers.

What remains in the "protected" sphere, therefore, are service-sector jobs that not only must be performed on site but require sufficient training and qualification (and are subject to sufficient monitoring from government or self-regulatory industry groups) to be resistant to potential labor supply from large-scale immigration, including in particular illegal immigrants lacking the requisite qualifications. Jobs requiring face-to-face client contact in sophisticated contexts are the obvious example.[23] But with ongoing advances in communications technology the meaning of "face-to-face" is changing, and even such sophisticated services as medical

evaluations are already beginning to be delivered remotely. Apart from resistance by industry groups and licensing authorities, there is no economic reason why the medical examination conducted via Skype between a U.S. patient in a rural area and a doctor at a U.S. urban medical center could not instead be done a doctor at some hospital abroad.

Many economists today expect the pace of technological advance – and with it, implicitly, what both Keynes and Meade called "technological unemployment" – to accelerate over coming decades. Mostly prominently, Erik Brynjolfsson and Andrew McAfie (2011, 2014) have argued that new digital technologies like driverless trucks and voice recognition systems will significantly enhance the rate of productivity growth in the United States and similar economies. But they acknowledge that these technologies will sharply reduce the demand for labor,[24] and they offer little answer to the question of what new applications of labor will emerge to take the place of the positions thereby eliminated; the technologies they see at the forefront of the new, faster productivity trend are overwhelmingly labor-saving. Even those like Robert Gordon (2012) who expect future productivity growth to be disappointing (mostly on the grounds that nothing on the horizon looks capable of matching the impact of world-changing advances of the past like steam power, railroads, electrification, the internal combustion engine and powered flight) nonetheless do not foresee substantial new demands for labor in medium- to high-wage jobs.

As a result, it increasingly looks as if Keynes's benign vision of "technological unemployment," in which the "fearful problem for the ordinary person" will be "how to occupy the leisure" (p. 328), is less likely than what Meade regarded as the "hideous outlook" of "an immizerized proletariat" (p. 33) desperately seeking whatever low-wage work it can get.

6. A Potential Solution: Keynes Meets Galbraith

The difference between Keynes's optimism and Meade's pessimism is, as we have seen, in large part a matter of disaggregation and distribution. Aggregate output has grown along the robust path foreseen by Keynes. But as Meade presciently foresaw, not everyone has shared equally in the fruits of this increase. Moreover, the widening inequality has not been random. The same force that was at the heart of both Keynes's and Meade's analyses – technological advance – has been central to the increasingly unequal distribution.

Writing after Keynes but before Meade, John Kenneth Galbraith (1958) spotlighted a quite different problem he saw emerging in post-war Western society – but, interestingly, likewise an issue apparent only from looking beneath economy-wide aggregates. While Meade's insight came from focusing on the distribution across individuals within the total of personal income, Galbraith examined the distribution between private consumption and public within the total of goods and services consumed. Writing fully a decade before the current trend of ever-widening income inequality began, Galbraith described what he saw as the abundant consumption of goods and services produced by private firms. In contrast, he thought consumption of those goods and services that only government or other public institutions could provide was inadequate and would become more so.

The difference between the two kinds of goods (and services too) is not entirely arbitrary. Many goods can be produced either privately or publicly, and under normal circumstances both efficiency grounds and other criteria that loom large in traditional Western thinking mostly warrant relying on the private sector for this purpose. But others – called "public goods" for just this reason – are inherently unsuitable for the private market, usually on grounds of non-excludability. National defense, public security and roads are all classic examples. Galbraith

pointed in particular to schools, police, parks, playgrounds, streets, sanitation, transportation, air quality, and parking. A key decision for any society, one that it cannot simply leave to the market (again, because of non-excludability, for example), is therefore how to divide its production, and its consumption, between privately and publicly produced goods. As Galbraith saw it, Western society in the post World War II era was characterized by "public poverty" together with "ever-increasing opulence in privately produced goods" (p. 199) – or, more concisely, "private opulence and public squalor" (p. 203).

The origins of the problem, he argued, were twofold. First, as in much of his other work, Galbraith assumed that advertising was highly effective in shaping consumer demands – not just on matters of which brand to buy in preference to some other, but more importantly increasing demand for the advertised products and even creating whole new demands for products that otherwise would not have been bought. The difference between the private and public sectors, in this context, was that the private sector had a profit-based incentive to engage in advertising, and therefore did so heavily, while the public sector did not. The result was to skew the composition of demand, bolstering the demand for privately produced goods, both individually and in the aggregate, at the expense of demand for public goods. Whether advertising is as effective as Galbraith assumed is a subject economists have long debated, and the question is far from settled. Moreover, today, when many states aggressively market their lotteries, and new government initiatives like expanded health care regularly rely on advertising to persuade the target public to take advantage of the services provided, the distinction between a private sector that advertises and a public sector that does not seems less clear-cut than it may once have been.

By contrast, the second argument Galbraith made for the skewing of demand toward private and away from public goods seems, if anything, more persuasive today, at least in the

United States. Demand for public goods by definition expresses itself through the society's public institutions, government foremost among them. Funding to pay for them is likewise a matter of public decision-making. The effectiveness of that demand, and of the funding for it, is therefore only as great as the effectiveness of the society's public institutions allows it to be. In today's era of paralyzed and otherwise dysfunctional government, in America especially at the federal level but in many states as well, the inability of the relevant participants to reach political agreement in effect blocks the demand for public goods from realization. When the economy is not fully employed, as in the wake of the recent financial crisis, the result is an absence of needed stimulus to aggregate demand. Under conditions of full employment, the outcome is exactly the skewing of overall demand, away from public goods toward (by default) privately produced goods, that Galbraith had in mind.

The relevance of Galbraith's argument to the current Keynes-Meade trap in which many of the advanced western economies now find themselves is that increased provision of public goods, whether produced by private firms or directly by government, offers the prospect of partly blunting both the aggregate and the distributional effects of ongoing technological advance about which Keynes and Meade wrote.[25] As Galbraith predicted, by now much of America's essential physical infrastructure suffers from depreciation or obsolescence or both. Modernizing and replacing it is a large task, likely to take not just years but a generation or more. Undertaking that process would increase not just aggregate demand for labor but, specifically, demand for labor not of the footman-butler-maid kind. And the nation would benefit not just from the making of renewed infrastructure but from the having of it.

Keynes's essay was prescient in some respects, though strikingly off the mark in others. Such is the risk of hundred-year prediction. In a way that would be consistent with much of his

later writing, however – especially that prompted by the depression that was just beginning when his "Grandchildren" essay was published – his error suggests a way forward. It is rare for an economy's short-term cyclical objectives (spurring employment during yet another protracted "jobless recovery"), medium-run objectives (combating the perverse distributional consequences of technological unemployment) and long-run objectives (where are today's equivalents to Grand Central Station and the Triboro Bridge?) to coincide to the extent that they do today. The combined analysis of Keynes and Meade and Galbraith leads to a consistent solution, even if only a partial one, at all three horizons.

7. Summary of Conclusions

Keynes's expectations for dramatically reduced work effort – and with it, the deep personal and societal challenges about which he expressed such vivid concern – have not materialized, at least not in the United States. After declining for more than a century, the average U.S. work week has now remained roughly unchanged for four decades. The primary reason is that Keynes's prediction for rising living standards has also been unfulfilled. With declining real wages (looked at another way, widening inequality), the median family income stopped rising at just about the same time that the work week stopped getting shorter. The continuing strong increase in per capita output that Keynes correctly predicted did not translate into rising living standards for the majority of families. What at first impression looks like a puzzling contrast between Keynes's strikingly accurate prediction about productivity and his wide-of-the-mark prediction about work turns out not to be a puzzle after all.

One way for society to address not only the ongoing problem of stagnant incomes for the majority of families but also the looming threat of what both Keynes called "technological unemployment" (compounded in the United States and similar economies by the ongoing shift of

new categories of both goods and services from the nontradable to the tradable sector, and in the United States by immigration patterns as well), is to take up the challenge of rebuilding the nation's deteriorating infrastructure. Doing so would simultaneously help ameliorate the problems he raised in his "Grandchildren" essay, and that James Meade foresaw in a different way, but also address the imbalance that John Kenneth Galbraith identified between private and social consumption – an imbalance that, at least in the United States, has worsened in the half-century since Galbraith wrote.

FIGURE 1

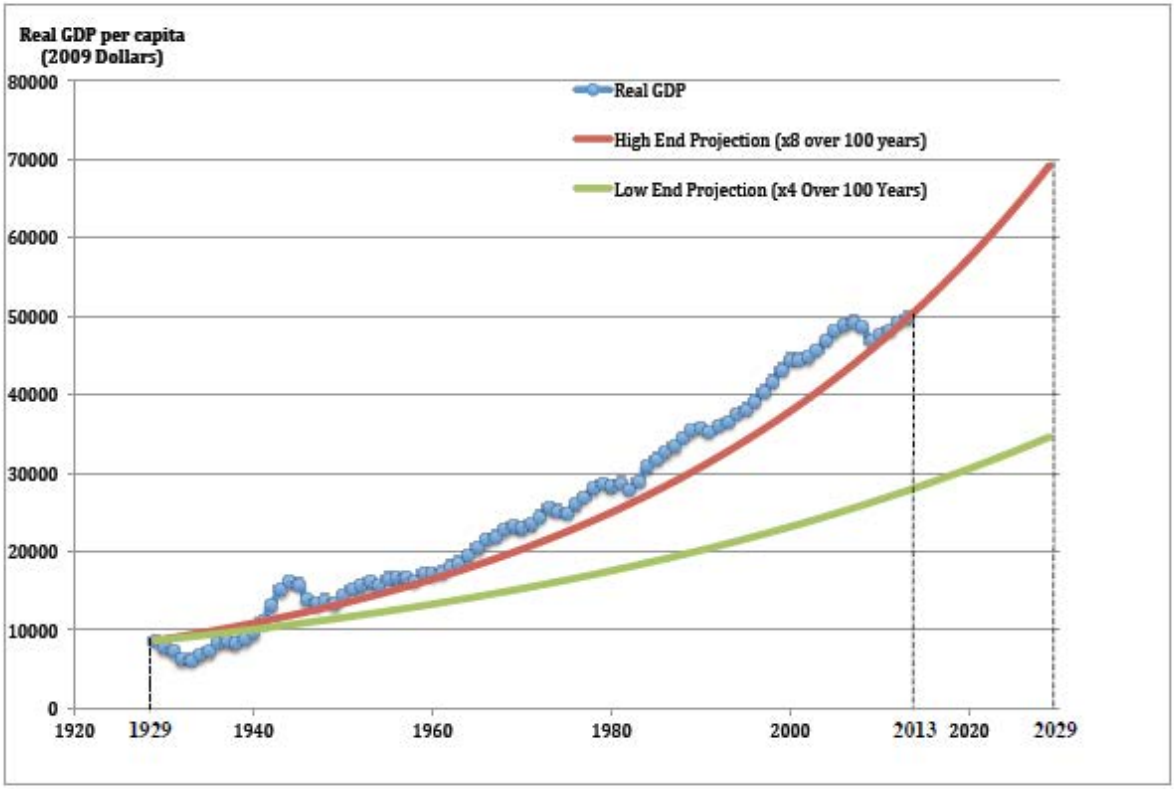
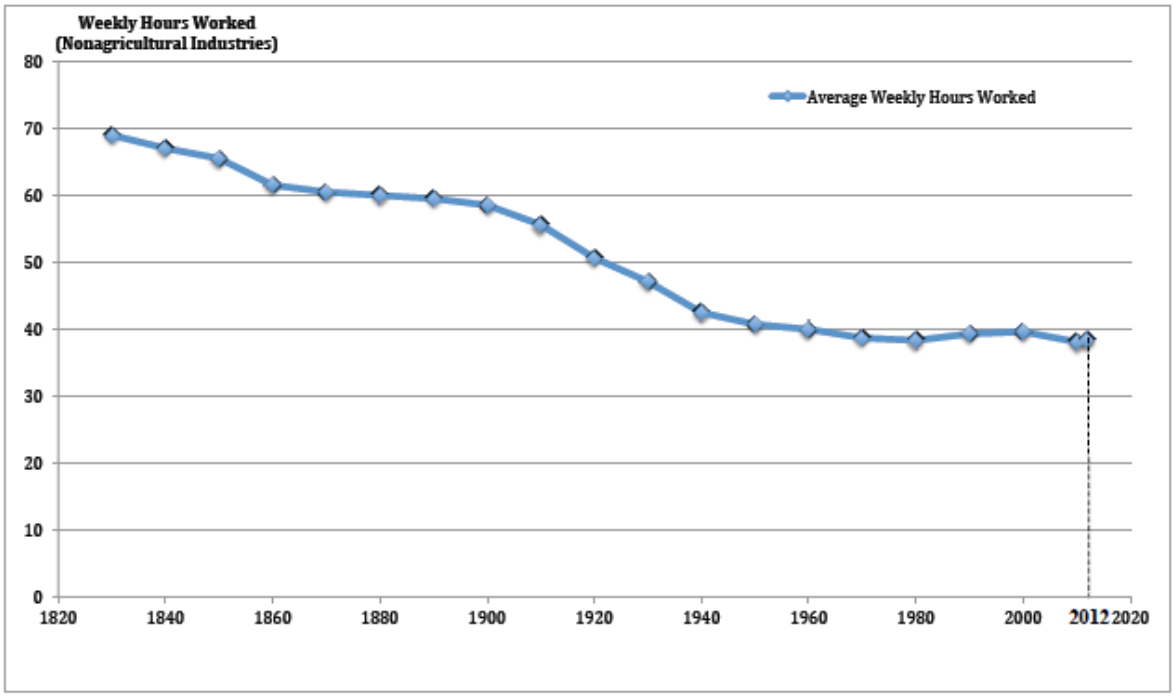
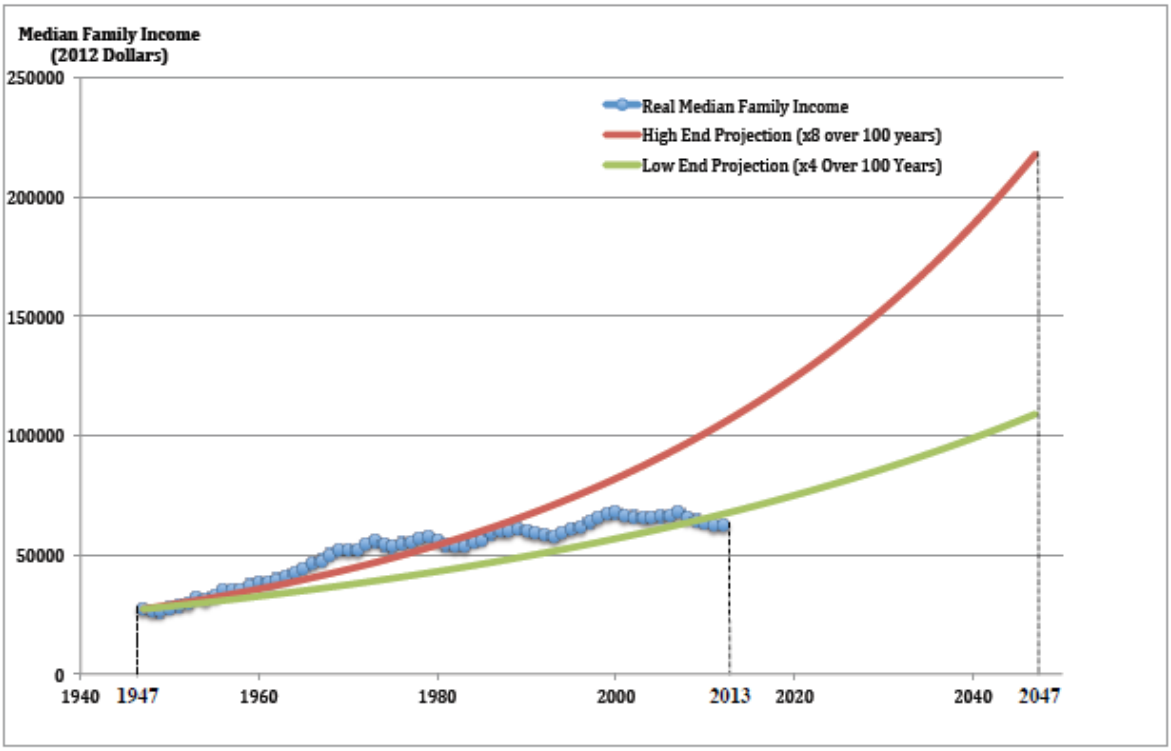

Real GDP per capita
(2009 Dollars)
80000
70000
60000
50000
40000
30000
20000
10000
0
1920
1929
1940
1960
1980
2000
2013
2020
2029
Real GDP
High End Projection (x8 over 100 years)
Low End Projection (x4 Over 100 Years)

FIGURE 2



Note: The data for average weekly working hours for 1830-1890 are from Vandenbroucke (2009) . The data for 1900-1940 are from the Historical Statistics of the United States, Series Ba4575. The data for 1950-1970 are from the Historical Statistics of the United States, Series Ba4576. The data for 1980-2012 are from BLS Report 1049 (2014).

FIGURE 3


Median Family Income
(2012 Dollars)
250000
200000
150000
100000
50000
0
1940
1947
1960
1980
2000
2013
2020
2040
2047
Real Median Family Income
High End Projection (x8 over 100 years)
Low End Projection (x4 Over 100 Years)

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[1] Keynes (1930). Keynes apparently wrote the paper two years earlier, before the onset of what became the Great Depression.

[2] The first systematic recognition and treatment in the United States appears to have been Wayland's (1837) political economy text.

[3] Page references for Keynes's essay are from Keynes (1972).

[4] Data on per capita gross domestic product are from the Bureau of Economic Analysis.

[5] Data on the average workweek are from Vandenbroucke (2009) for 1830-1890, from the *Historical Statistics of the United States* for 1900-1970, and from the Bureau of Labor Statistics for 1980-2012.

[6] See Gordon (forthcoming), Ch. 8, for a detailed discussion of the changes over time in the United States.

[7] Data on occupations are from the *Historical Statistics of the United States*.

[8] See, for example, Putnam (2000), Ch. 5.

[9] Data on median family income are from the Bureau of the Census.

[10] Some part of the difference between the growth of output per capita and of median family income reflects the fact that family size has shrunk over this period, and therefore does not properly bear on the argument here. But the difference is not great in this context. Between 1947 and 2012 the average number of persons per family in the United States fell from 3.67 to 3.13 (data are from the Current Population Survey). With adjustment for family size, the growth of real median family income over this period would produce a multiple of 4.6 over a hundred years – more than for the raw data, but still well below the trajectory of real output per capita.

[11] In 1973 the average number of persons per family was 3.48. With adjustment for the smaller size of families, the realized growth between 1973 and 2012 would produce a multiple of 1.5 over one hundred years – somewhat larger than without the family size adjustment, but still far from even doubling.

[12] In 1973 female participation in the labor force was 44.7 percent; by 2012 it was 57.7 percent. (The peak, in 1999, was 60.0 percent.) Much of this increase, however, was offset by declining male labor force participation: from 78.8 percent in 1973 to 70.2 percent in 2012. As Figure 2 shows, there was also some modest further decline in average hours worked per week. But the main reason for the slower rise of real family incomes was the decline in real hourly wages. Data on real hourly wages are from the Bureau of Labor Statistics, adjusted (slightly) to correct for a series break at 1966.

[13] See especially Goldin and Katz (2008).

[14] See Elsby et al. (2013) on the United States and Karabarbounis and Neiman (2014) on the decline of the labor share as a global phenomenon. A large literature has developed suggesting explanations for this development.

[15] See Munnell et al. (2014) for a review of the most recent evidence.

[16] In the United States the number of people participating in the Supplemental Nutritional Assistance Program ("food stamps") was roughly stable at 20-25 million until the 2007-9 financial crisis, but since then it has nearly doubled. By contrast, publicly provided housing has shrunk relative to the growing population. Medicaid (the main medical care program for the indigent) has increased enormously in cost, but it is not obvious that recipients feel better off because their medical care costs more.

[17] See, for example, Krueger and Perri (2006) and Meyer and Sullivan (2013).

[18] Aguiar and Bils (2013), p. 1.
[19] Lebergott (1993), for example, has made this argument.
[20] *The 1902 Edition of the Sears, Roebuck Catalogue* (New York: Gramercy Books, 1993).
[21] The modern literature on the role of habit formation in consumption preferences is large. For two early contributions, see Constantinides (1990) and Campbell and Cochrane (1999).
[22] Data on telephone penetration are from the *Historical Statistics of the United States*.
[23] Frey and Osborne (2013), for example, emphasize this aspect of the shift to service-sector employment.
[24] See especially Brynjolfsson and McAfee (2014).
[25] Tax payments also come from citizens' incomes, of course, and so apart from distributional consequences there would be little point, in the context of this discussion, of taxing the median earner's income in order to fund public-sector demand that creates employment for the median worker. But the tax revenues would largely come from those citizens who already have high-income jobs, while the jobs created – in rebuilding the nation's infrastructure, for example – would presumably be taken by those who don't.