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Abstract

Schumpeter's concept of creative destruction as the engine of capitalist development is well-known. However, that the destructive part of creative destruction is a social cost and therefore biases our estimate of the impact of the innovation on NNP and on welfare is hardly acknowledged, with the exception of Witt (1996). We conjecture that recently the new technologies are often creating products which are close substitutes for the ones they replace whose value depreciates substantially in the process of destruction. Consequently, the contribution of recent innovations to NNP and to welfare is likely biased upward. This note calls for a research agenda to estimate and decompose innovations into their creative and destructive components.

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Has Creative Destruction Become More Destructive?

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Economic growth is fueled to a considerable extent—some would say primarily--by the innovations of larger-than-life entrepreneurs, a process Joseph Schumpeter famously dubbed “creative destruction” (Schumpeter, 1942; Aghion, and Howitt, 1998). In his dynamic conceptual framework entrepreneurs invent new products or new ways of doing things in order to increase efficiency, improve quality, or lower price, thereby bringing about the obsolescence of their counterparts who lagged behind and failed to seize those opportunities.¹ The ancient is destroyed in the process of creating the new in a Darwinian--or perhaps even more appropriately--in a Spencerian competitive process of survival of the fittest—or the most profitable (Hodgson, 2002). Thus, creativity is at once constructive and destructive: evolutionary progress is not painless by any means (Tanner 1996). There are not only gainers but also losers and society pays for the new with various levels of “hardship” or even “a lot of suffering” (Witt, 1996; Krugman, 2014). Technological change is therefore never ever “Pareto efficient”—as Schumpeter himself recognized, inasmuch as the losers are never adequately compensated either by the winners or by the society (Schubert, 2013).

Schumpeter’s creativity ratio

Nonetheless, Schumpeter and those who followed in his footsteps asserted that creative destruction was, in the main, welfare enhancing at least in the long run (Witt 1996). In order to explore this aspect of his concept a bit further, we decompose an innovation into a creative (C) and a destructive component (D) measured in monetary units or in employment. In order to assess the effect of a single innovation, we define the Schumpeter’s creativity ratio as $ScR = \frac{C-D}{C}$. D can be viewed as a negative externality—a cost that is imposed on third parties (Witt 1996). While C is the measured value added to NNP by the

innovation, C-D is its true contribution to it (net of the negative externality). The primary purpose of this note is to urge empirical investigation in order to estimate the trend in ScR in order to explore the hypothesis that it has been declining recently.²

We note first that the negative externality can impact NNP, employment, or welfare and it can fall on producers or on consumers. As an example of an externality that falls on the former consider an innovation by firm A that creates a new product at $t = 1$ that forces the closing of another firm, B. Suppose that A's output at time $t = 1$ is valued at $C = \$10$ and that at $t = 0$ (i.e., prior to the innovation) firm B's output was $D = \$4$ which suddenly becomes obsolete so that its value declines to 0. The depreciation of that part of B's capital equipment that cannot be put to other uses, as well as its employees who are unable to find work elsewhere, is a negative externality valued at \$4 a year, its value added to NNP.

For instance, D might include the value of newspapers (net of raw materials such as paper and ink) produced by a printing press that ends up in the scrap pile while its 50-year-old operator becomes permanently unemployed on account of innovations by firm A in the IT sector. The company producing newspapers had depreciated fully the printing press long time ago so that it is carried on the books at zero effective value although it was still producing newspapers until then. Along came the internet, the demand for the newspapers decreased, the company ceased operation, and the printing press became scrap. Such destruction of physical capital would not be included in the calculations of the Bureau of Economic Analysis, because the book value of the printing press was zero at the time of bankruptcy.³ At $t = 1$ the printing press and its operator are no longer contributing to economic activity but they would have been contributing in the absence of the innovation. Thus, the contribution of the innovation is not a net value added to NNP. It appears as though firm A contributes \$10 but its true contribution net of that which would have obtained in its absence is \$6. Thus, C, the measured value of the new product is not a net

value added to NNP or to society's well-being, because of the social cost externality produced. In this example, the innovation created a net gain in NNP of $(C-D) = \$6$ with $ScR = \frac{10-4}{10} = 0.6$. This accounting inaccuracy is misleading, because the appearance is as though the innovation was more important than it actually was. Although the growth in NNP in this case is correctly measured as \$6 (the difference in A's output at $t = 1$ and that of B's at $t = 0$), the appearance is that A's contribution is \$10.

Another kind of externality is the kind that falls on consumers. In this version of Creative Destruction the firm introduces a new product that does not bankrupt another firm but renders a consumption good—produced by itself or another firm--unexpectedly obsolete. The obsolescence can be planned or not. Planned obsolescence is a favorite strategy of oligopolies for products such as video games, textbooks, software, consumer electronics, where upgrades and the latest versions with minor improvements are introduced periodically with the aim of convincing the consumer of its superiority in spite of minor improvements. Such a strategy depreciates the value of the predecessor version and increases the profits of the corporation.⁴ Thus, new versions of existing products frequently do not add a lot of net value to our welfare in proportion to the amount by which they increase NNP. This strategy is profitable, because the quality of a new product is not immediately obvious and because firms can instill in the consumer the feeling that they need the newest version although the older one is still functioning well. There are hidden qualities which are not apparent until one has some experience with the product.⁵ Then there is a tendency to force consumers to switch by not providing compatibility with connectors or programs and not providing support indefinitely.⁶ Microsoft often forces upgrading by making older file versions inaccessible and inoperative.⁷

Conjectures on the trend in ScR

Clearly, the closer is the substitutability between the new and the old product (or the new and old ways of doing something) the lower is ScR. A casual examination of the evidence leads one to think that ScR was very high during the First and Second Industrial Revolutions until the post-industrial age, because the degree of substitutability between the new and the old product was low. Hence, the creative component of innovation must have been high relative to the destructive component. Schumpeter was undoubtedly thinking of the great innovations associated with steam engines, railroads, steam boats, iron, steel, petroleum, chemicals, electrification, telegraph, telephone, radios, automobiles, airplanes, film making, paper making, plastics, rubber, and machines and engines of all sorts. No doubt that the entrepreneurs associated with these innovations did force old firms and industries out of business but surely their destructive component must have been minuscule compared to the value added to NNP. Thus, our conjecture is that ScR must have been very large ($C \gg D$). The reason is that all of these innovations satisfied a basic need innate to human nature so consumers did not need a lot of convincing to adopt these new products. In addition, the firms that were replaced were small-scale operations working with little capital. Hence, the destructive force of the new products was likely to have been relatively small.

For instance, innovations such as the incandescent bulb replaced the kerosene lamp and the value added to NNP as well as to welfare in terms of reliability, convenience, health, and safety were humongous. The destruction of the kerosene lamp industry could not have been a major loss to the economy. Similarly, the telephone was a new technology that replaced nothing but the pigeon carrier and perhaps some mail. In short, these new technologies replaced traditional non-mechanized small-scale operations so that the gains in economies of scale were gigantic. Hence, the substitution effect must have been fairly small and ScR must have been very high and their destructive component negligible so that the creative part of creative destruction obviously dominated. What's more the technologies of

the first and second Industrial Revolution used labor on a massive scale. That is no longer the case.

Welfare and Creative Destruction: Past, Present and Future

Empirical research estimating the size of the destructive power of innovation would be extremely useful in understanding more fully the contribution of innovation to our well-being. It is generally acknowledged “that, on balance, the process of creative destruction is more creative than destructive, not only with regard to employment but also concerning broader perspectives of growth and welfare” (Heertje, 1987). This was probably true even for some time thereafter with major innovations such as PCs, laptops, and cell phones. However, informal observation leads us to conjecture that by the turn of the 21st century ScR declined markedly, because recent innovations, mostly in the IT sector, have had substantial substitution effects between the new and the old products with increasing destructive components ($C \ll D$).⁸

Consequently, our conjecture is that the benefits reaped from creative destruction has declined substantially over time and is likely to remain at a low level. In other words, the net value added to NNP, to employment, or to welfare,--net of the negative externalities—has most likely diminished at least by the turn of the 21st century. The primary reason is that our innate basic needs have been satisfied with existing technologies that are produced by firms efficiently on a large scale. Hence, new firms may be able to destroy competing firms due to a slight competitive advantage or because of novelty but nonetheless fail to increase employment, welfare, or NNP significantly. In addition, the amount spent on convincing people to adopt the new products has also increased.

Consider that tablet computers expanded at the expense of laptop computers; Amazon replaced countless local bookstores as well as Borders, which in 2003 had more than 1,200 stores. Furthermore, the smartphone replaced simple cell phones and traditional

cameras. The “selfie” replaced the “Kodak moment” but Kodak employed 86,000 in 1998, and 145,000 at its peak (and paid them mostly middle-class wages),⁹ while in 2014, after emerging from bankruptcy, it has a skeleton workforce of 8,000.¹⁰ The bankruptcy of Kodak was likely more substantial in terms of depreciation of plant and equipment than the destruction of hand-loom weavers, kerosene lamp makers, or horse-and-buggy makers.¹¹

In contrast, Apple,--one of the iconic corporations of the information era,--has but 47,000 employees, two-thirds of whom are earning below middle-class wages. No wonder we are experiencing a “jobless recovery”. For instance, that U.S. employment in the “internet publishing, broadcasting and search portals” sector increased in the fifteen years from March 1999 until March 2014 from 64,000 to 151,000 (or by 87,000);¹² at the same time, however, the number of jobs in the newspaper publishing industry was halved from 424,000 to 212,000 with a decline of 212,000 jobs. Hence, the net loss of jobs in this process of creative destruction was around 125,000 in 15 years.

Moreover, because of the internet revolution, many traditional newspapers are decreasing their print edition or discontinuing them completely and going digital--including the Christian Science Monitor, with a concomitant loss of jobs.¹³ Many newspapers succumbed to bankruptcy such as the Tribune Company and the Sun-Times Media Group.¹⁴ With the expansion of the internet, advertising revenue of newspapers plummeted by two-thirds of its 2001 peak of \$65 billion to \$24 billion in 2013,¹⁵ while internet ad revenues increased in the same time span from \$7.2 billion to \$42.8 billion, essentially replacing the amount lost to newspapers,¹⁶ with total advertising revenue remaining unchanged.¹⁷

While social networking facilitated by Facebook is a popular feature of the internet, basically it merely replaces older ways of socializing without adding much to our feeling of well-being.¹⁸ It monetized activities that were for the most part left previously outside of the market’s purview.¹⁹ Market capitalization of Facebook is inching toward \$200 Billion, and

Twitter, WhatsApp, Instagram are all household names worth billions but probably add much less value to real NNP, welfare and employment beyond the technologies and firms they replaced. This is the case, because the needs they respond to were satisfied for the most part prior to their existence. They destroyed old forms of communication to which they are close substitutes; hence, my hypothesis is that their ScR value is relatively small. Besides, Facebook has merely 7,000 employees.²⁰

The current list of “disruptive technologies” that are likely to usher in future waves of innovation include such fields as education, information, nano- and biotechnology including genetic engineering, cognitive science, robotics, and artificial intelligence. These are not likely to offer major consumer goods which make up the most important part (70%) of US NNP and even those that might be forthcoming promise not to satisfy a basic need that is not already satiated. Therefore, it seems like the innovations of the foreseeable future will probably not create substantial net gains in NNP; rather, they will be mostly close substitutes for already existing technologies implying that C-D will be probably fairly small, as with “Google Glass” or the driverless car. These might become trendy gimmicks, might even become useful in some circumstances but do not promise great gains in welfare, employment, or NNP. After all, one still has to sit in the car even if it is driverless and the gains in productivity from switching from listening to music to texting or answering email are likely to be negligible. Similarly with genetic engineering: we might be able to increase life expectancy but I doubt it will add to much to NNP per capita.

Thus, we conjecture on the basis of this impressionistic evidence relating to the nature of recent technological developments, that creative destruction by the 21st century has deviated from its previous manifestations insofar as its ScR value seems to have declined conspicuously. This implies that the contribution of the innovation to NNP growth,

employment, and our welfare will likely be overestimated insofar as it does not account for the negative externalities caused by the destructive forces of creative destruction.

Bite-Backs

We have been discussing the immediate destructive negative externalities of innovation but there are longer-terms ones as well which are not directly evident. Although himself optimistic about future developments, Joel Mokyr, the distinguished historian of technology, acknowledges that technological change is by no means a free lunch; one needs to consider the “bite-backs” as well: “most technologies developed in the 20th century had unanticipated side effects, most of them negative”. Of course, this is not what Schumpeter had in mind with destructive forces, nonetheless, innovations such as DDT, chlorofluorocarbons, carbon fuels, leaded gasoline, fast food, asbestos, lead-based paint, generated negative externalities whose true costs were discovered long after they were implemented and therefore created an illusion of productivity increase, not to mention the technological causes of global warming. “It is thus now plain we have overestimated the productivity gains associated with technological change in the 20th century” (Mokyr 2014). “This means the social costs of new techniques (as opposed to the costs captured in market prices) are systematically underestimated” (Mokyr, 2014). He suggests that such unanticipated costs are “very common; indeed, it is hard to come up with examples of a major breakthrough in technology in which it was not later realized that the accompanying ‘creative destruction’ included some of the uncreative sort. Unfortunately, correcting national income calculations to account for such effects is difficult” (Mokyr, 2014). This essay argues, however, that we need to begin estimating all the negative externalities including the value of these “bite-backs” in spite of the obvious challenges and we should do so retrospectively going back to the First Industrial Revolution. That would give us a much

better sense of economic performance and improve our ability to frame policy going forward.

Innovation as rent seeking

There are many other unresolved issues surrounding the welfare-effects of innovation that need to be explored further. Not all innovation enhances productivity as many are designed for rent seeking purposes. That is also Paul Volcker's assessment of the financial innovations associated with the financial crisis: in his view the only innovation in the financial sector that raised productivity and improved social welfare was the automated teller machine (ATM) and that was a product of mechanical engineering designed in the 1960s in Great Britain and not on Wall Street.²¹ The myriad of so-called financial innovations culminated in an immense "bite-back" which added up to \$7 trillion support from the government and an annual loss in output in the U.S. alone of about \$1 trillion. The financial crisis should provide an incentive to develop institutional mechanisms to assess the riskiness of innovations and to foster Pareto-improving innovations (Witt, 1996). The FDA tests drugs before they can be used commercially; there is no reason why we cannot test other products for their side effects in order to be able to make informed choices about their desirability²² (Offer, 2006, p. 35).

Innovation and Pareto efficiency

Another often neglected controversial aspect of technological change worth mentioning is that it is not at all democratic, insofar as entrepreneurs impose their will on the society and thereby redistribute income. It is contradictory that we celebrate such a process even though it is not Pareto efficient while at the same time we generally argue against the government redistributing income for exactly the same reason, i.e., that the redistribution is not Pareto efficient (Witt 1996). From what derives these privileges of the entrepreneur that do not accrue to the state?

We think that this is a major conundrum in economic theory and we need to think about laws and institutions that will defend the rights of those who are in the danger of being hurt. The goal of such institutions would be to ensure that there are no losers in the process of economic growth. For instance, some European countries have realized that destroying local bookstores was not such a good idea and limited the amount of discount Amazon is allowed to grant as a defense mechanism of Amazon's destructive forces.²³ Another example comes up in English common law in which the owner of a building with windows that has had natural daylight for at least 20 years enjoys a "right to light" so that new construction is not allowed to impinge upon it.²⁴ This is an example of "Pareto-optimal" growth that should be more widely adopted. In fact, Witt suggests that we should innovate in such a way as to minimize its destructive consequences (Witt, 1996).

Prognosis for growth

The conjecture expressed in this essay dovetails with several pessimistic prognoses about the future of the US economy insofar as many prominent economists are arguing that economic growth is going to be slow as far as the eye can see. In turn, this essay is arguing that the growth rates are not only going to be decoupled from employment but also from our sense of well-being. Mokyr also notices that "a wave of pessimism has swept the economics profession – with many analysts concluding that the best is behind us, i.e., that the low-hanging fruits of technology have been picked and that we can no longer replicate the enormous technological successes attained [in the past]" (Mokyr, 2014). According to scholars such as Larry Summers (Harvard), Robert Gordon (Northwestern), and Nobel-Prize winning economists Paul Krugman (Princeton) and Joseph Stiglitz (Columbia) the post-industrial service economy is going to be stuck in low gear for the foreseeable future,--at least for 99% of the population.²⁵ The arguments of these scholars recognize a number of impediments to growth including: pervasive political dysfunction (Krugman)²⁶, inadequate

aggregate demand (Summers),²⁷ pervasive inequality (Stiglitz),²⁸ and an array of structural problems including most importantly, slow productivity growth (Gordon).²⁹ Gordon points out that slowdown in innovation and growth in labor productivity since 1972 is another reason to be pessimistic about our future prospects, and forecasts that the real disposable per capita income of the bottom 99% of the income distribution will grow at a negligible rate of 0.2% (Gordon, 2012, 2014).³⁰

Although Tyler Cowan (George Mason) as well as the team of Brynjolfsson and McAfee (MIT) retain their optimism, they admit that technological unemployment will be with us for the foreseeable future unless we enact far-reaching policies to reform our educational system to counter those tendencies³¹ (Cowan 2011, 2013; Brynjolfsson and McAfee 2012, 2014).

In particular, Brynjolfsson and McAfee argue that technological change has advanced to such a high level, that we need fewer workers to sustain production, leading to a “jobless recovery”. Since the Meltdown of 2008 the employment/population ratio has declined by some 5 percentage points and 12.5% of the labor force is still underemployed 6.5 years after the start of the recession. This is evidence that GNP growth has been decoupled from employment, insofar as firms switched from human labor to robot labor. In other words, people are becoming increasingly redundant through automation and endemic underemployment is with us for the conceivable future (Brynjolfsson and McAfee, 2012).

Conclusion

In sum, we live in a culture that adores the “gospel of innovation” without acknowledging forthright and understanding the negative externalities associated with it (Lepore 2014). In fact, “disruptive innovation” is celebrated to such an extent that Krugman thinks it “glamorizes business” (Krugman 2014). Nowadays creative destruction is being taken to a new level: “devastating innovation” with no consideration of how much of it will

improve the human condition: “the question [is] whether a novelty is an improvement: the world may not be getting better and better but our devices are getting newer and newer” (Lepore 2014).

The transition to a post-industrial economy has been far from advantageous to the well-being of a substantial share of the population. Just because we have been innovating and growing successfully for a quarter of a millennium by no means imply that the process will, or should, continue indefinitely. There is no such economic theorem and the historical record indicates that there are times when economic regimes do reach a tipping point and abruptly change direction. The above mentioned scholars are doubtful about our ability to continue on the path forged since the First and Second Industrial Revolutions. The new technologies might well be brilliant and create immense wealth for a few, thereby continuing to exacerbate socio-economic inequality and exclude an ever increasing share of the population from the middle class. Yet, the numbers of underemployed and working poor will probably swell (Brynjolfsson and McAfee, 2014). It is more than likely that we have entered an age of a new normal (Galbraith, 2014) that will resemble more closely the social structure of the *ancien regime* than that of an ephemeral ideal economy (Piketty 2014). This note adds another dimension to this conjecture, namely that there has been a shift in the destructiveness of new technologies and this effect has so far not been captured adequately in the economic statistics that we use to gauge the performance of the economy and to formulate policy. This essay calls for empirical research in order to explore this conjecture.

In brief, our hypothesis is that the new technologies that are being created bring about larger negative externalities than in previous epochs by forcing the early and premature obsolescence of products and firms they destroy. However, these externalities are not adequately understood so that our evaluation of the contribution of the innovation to NNP, to welfare and to employment is overestimated. This is the case, we have argued,

because the destructive power associated with Schumpeterian creative destruction has increased markedly relative to their creative component, in contrast to previous epochs. Creative destruction's gentle winds have mutated into cyclones of destruction. Thus, our sense of well-being will probably not keep pace with even the slow economic growth being predicted by Gordon, Summers, and Krugman. While the economy will be growing, albeit slowly, we predict that our sense of well-being will be mysteriously lagging well behind.

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Endnotes

¹ This is also be true of new capital investments as an addition to the capital stock without innovation may cause some of the existing capital stock of others to become obsolete.

² Davis et al. measure job flows between new and old job descriptions and find that 10% of jobs is created and destroyed annually. However, the study was limited to manufacturing and changes in job description do not necessarily imply creative destruction (Davis, Haltiwanger and Schuh, 1996).

³ Depreciation in the National Income and Product Accounts are based primarily on magnitudes reported by corporations to the Internal Revenue Service. Bureau of economic Analysis, 1998 "A Guide to the NIPA's," *Survey of Current Business* March. http://www.bea.gov/scb/account_articles/national/0398niw/maintext.htm. I am grateful to Lisa Lynn of the Bureau of Economic Statistics for explaining to me the intricacies of the depreciation estimates.

⁴ For instance, while Microsoft's XP operating system probably had a higher value added, its successor, the Vista version was less successful and its ScR was probably tiny.

⁵ Apple is notorious for predatory strategies to ensnare customers.⁵ When we buy an iPhone we are not informed when the next version will be released. A new generation of iPhones makes the previous version unfashionable and thrusts many consumers out of their equilibrium. The depreciation that the new version induces in the current value of iPhones is unanticipated and is also not subtracted from NNP, i.e., NNP increases with the full value of the new iPhone when it is sold while our welfare does not increase proportionally.

⁶ According to Avner Offer, "The process of constant upgrading means that users never have time to master the software, and are therefore stuck permanently at the bottom of the learning curve, thus deriving less welfare than the innovation is capable of delivering." Personal communication.

⁷ The fashion industry is another example of a sector in which new products mostly replace existing products for which they are close substitutes and which would not have been devalued had it not been for the creation of the new products (Veblen, 1899). By creating and promoting new fashion part of our inventory of clothing is rendered obsolete. That means that we do not obtain as much utility from the clothing we now have as we anticipated at the time of purchase. We are not told how long a particular fashion will last. The new fashion suddenly and unexpectedly depreciates the value of the old but because they are close substitutes ScR is probably small: the fashion industry has a large destructive component but it is big business with \$250 billion annual product in the U.S. and \$1.2 trillion world-wide. Hence, its contribution to the mis-measurement of NNP is likely to be substantial and likely increasing as the products of fashion have become a bigger part of our expenditure. Statistic Brain, <http://www.statisticbrain.com/fashion-industry-statistics/> accessed May 11, 2014.

⁸ The date here is purely conjectural and should be tested in subsequent empirical research.

⁹ Teather, David "Kodak pulls shutter down on its past," *The Guardian*, January 22, 2014. <http://www.theguardian.com/technology/2004/jan/23/newmedia.gadgets> Accessed June 4, 2014. Steven Pearlstein, "Review: 'The Second Machine Age,'" by Erik Brynjolfsson and Andrew McAfee," *The Washington Post*, January 17, 2014.

¹⁰ Wikipedia, "Eastman Kodak," https://en.wikipedia.org/wiki/Eastman_Kodak#cite_note-66 accessed June 4, 2014.

¹¹ Kodak Park is being converted to other uses. It would be useful to calculate how much value was destroyed in the bankruptcy of the firm. Wikipedia, "Eastman Business Park," https://en.wikipedia.org/wiki/Eastman_Business_Park accessed June 17, 2014.

¹² Bureau of Labor Statistics, Current Employment Statistics Survey, Series ID: CES5051913001 and CES5051111001 <http://www.bls.gov/> accessed June 3, 2014.

¹³ Wikipedia, "Creative Destruction," https://en.wikipedia.org/wiki/Creative_destruction#cite_ref-pifrontpage_22-0 accessed June 4, 2014.

¹⁴ Wikipedia, "Decline of Newspapers," https://en.wikipedia.org/wiki/Decline_of_newspapers accessed June 4, 2014.

¹⁵ Newspaper Association of America, <http://www.naa.org/Trends-and-Numbers/Newspaper-Revenue/Newspaper-Media-Industry-Revenue-Profile-2013.aspx> accessed June 4, 2014. Wikipedia, “Decline of Newspapers,” https://en.wikipedia.org/wiki/Decline_of_newspapers accessed June 4, 2004.

¹⁶ Interactive Advertising Bureau, “IAB internet Advertising Revenue Report,” http://www.iab.net/media/file/resources_adrevenue_pdf_IAB_PWC_2001Q4.pdf accessed June 8, 2013; Interactive Advertising Bureau, “2013 Internet Ad Revenues Soar To \$42.8 Billion,” http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/pr-041014 accessed June 8, 2013.

¹⁷ Interactive Advertising Bureau, “IAB internet advertising revenue report.” http://www.iab.net/media/file/IAB_Internet_Advertising_Revenue_Report_FY_2013.pdf, p. 20, accessed June 8, 2014.

¹⁸ Similarly, Starbucks must have added little value to the economy over traditional coffee makers.

¹⁹ And it is not at all obvious that the outcome increases our sense of well-being: “What do you post to Facebook? Pictures of yourself yelling at your kids, or having a hard time at work? No, you post smiling photos of a hiking trip with friends. You build a fake life — or at least an incomplete one — and share it. Furthermore, you consume almost exclusively the fake lives of your social media “friends.” Unless you are extraordinarily self-aware, how could it not make you feel worse to spend part of your time pretending to be happier than you are, and the other part of your time seeing how much happier others seem to be than you?” Arthur C. Brooks, “Love People, Not Pleasure,” *The New York Times* July 18, 2014

http://www.nytimes.com/2014/07/20/opinion/sunday/arthur-c-brooks-love-people-not-pleasure.html?emc=edit_th_20140720&nl=todaysheadlines&nliid=48226764&r=0 accessed August 1, 2014.

²⁰ Wikipedia, “Facebook,” <https://en.wikipedia.org/wiki/Facebook> accessed June 4, 2014.

²¹ “Paul Volcker: Think More Boldly,” *The Wall Street Journal*, December 14, 2009, <http://online.wsj.com/news/articles/SB10001424052748704825504574586330960597134> accessed June 29, 2014.

²² We should also attempt to identify innovations that do not add to NNP but are designed for rent-seeking purposes.

²³ Pamela Druckerman, “The French Do Buy Books. Real Books,” *The New York Times* July 9, 2014, accessed http://www.nytimes.com/2014/07/10/opinion/pamela-druckerman-the-french-do-buy-books-real-books.html?emc=edit_th_20140710&nl=todaysheadlines&nliid=48226764 July 12, 2014.

²⁴ I thank Lee Craig for pointing this out. Wikipedia, “Right to Light,” http://en.wikipedia.org/wiki/Right_to_light accessed August 1, 2014.

²⁵ For an economic model of secular stagnation, see Eggertsson and Mehrotra, 2014.

²⁶ Krugman has characterized the current state of the economy as one stuck in a “low-level depression” although he thinks that in the long run it would be possible to extricate ourselves

from these doldrums if we could only get our political system to function properly and adopt Keynesian policies (Krugman, 2012). While this prescription seems theoretically plausible, there is no political leader or political movement on the horizon that could overcome the immense momentum of path dependence such as experienced by many other states facing similar predicaments. Theoretically, Louis XVI could have transformed his monarchy into a well-functioning constitutional system but the vested interests and the limitations of his own imagination were powerful enough to prevent such drastic departure from the status quo (Olson, 1984). The vested interests of today are just as powerful and just as dogmatically opposed to the modernization of the political-economic system. In addition, intellectual succor is provided for them by economists who are staunch opponents of Keynesian policies. So the political stalemate is a mirror image of the stalemate in the economics profession. That implies that political systems can become trapped in a dead end with no feasible exit within the established legal framework and ideological structure.

²⁷ It is significant that Larry Summers has come out in support of the “secular stagnation” thesis, because in earlier pronouncements, especially while he was in the administration, he projected much more optimism about the shape of things to come. He now argues convincingly that “something is a little bit odd” about the performance of the US economy in the 21st century. He noticed that in spite of the easy-money policy of the Federal Reserve, the explosion of debt as people withdrew their savings from their house equity, the “vast amount of imprudent lending”, and consumers giddy from a false impression that they were wealthy “in excess of its reality”, the economy was by no means growing as one would expect in a boom. Summers concludes that in spite of all these factors that should have fueled aggregate demand, “Capacity utilization wasn’t under any great pressure. Unemployment wasn’t under any remarkably low level. Inflation was entirely quiescent. So somehow, even a great bubble wasn’t enough to produce any excess in aggregate demand” (Summers 2013). According to Krugman this was a “very radical manifesto,” as Summers is really saying that “we may be an economy that needs bubbles just to achieve something near full employment—that in the absence of bubbles the economy...” will continue to falter (Krugman 2013). In short, Summers is suggesting that the US economy has morphed into a regime of secular stagnation.

²⁸ Joseph Stiglitz has identified our pervasive and growing inequality as a major culprit in our weak macroeconomic performance (Stiglitz 2012)

²⁹ Gordon cites a number of “headwinds” that gives rise to this slowdown including the poor educational system, the extremely skewed distribution of income which keeps purchasing power out of the hands of those who would like to spend and puts them into the hands of those who have nothing more to spend on. The role of the poor performance of the educational system plays a large role in the slowdown in productivity growth (Gordon 2012, 2014). Even those with a college degree in the US score well below average of the scores obtained in mathematics proficiency and in reading by students in advanced industrialized countries (Carey, 2014).

³⁰ Of course, the various factors impeding future growth are interrelated because people with a poor education are not going to be employable in the IT sector. Hence, the poorly educated are most likely to be at the mercy of technological unemployment and join the ranks of the unemployed fueled by globalization and competition with low-wage labor in Asia.

³¹ What they fail to see, however, is that the current unbalanced educational system is regrettably cast in stone unless we were somehow able to redistribute income on a very large scale which remains a pipedream utterly contrary to the spirit of the age.