¿Has Schumpeterian Creative Destruction become more destructive?

¿La destrucción creativa Shumpeteriana se ha vuelto más destructiva?

John Komlos
Professor Emeritus, University of Munich
john.komlos@gmx.de

Fecha de recepción: 18 de febrero de 2016
Fecha de aceptación: 15 de marzo de 2016

Sugerencia de citación: Komlos, J. (2016). ¿Has Schumpeterian Creative Destruction become more destructive? ***tiempo&economía***, *3*(1), 9-18, doi: http://dx.doi.org/10.21789/24222704.1092

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 and economic cost and therefore biases our estimate of the impact of the innovation on GDP is hardly acknowledged, with the notable exception of Witt (1996). Admittedly, during the First and Second Industrial Revolutions the magnitude of the destructive component of innovation was no doubt small compared to the net value added to employment or GDP.

However, we conjecture that recently the new technologies are often creating products which are close substitutes for the ones they replace whose valu e depreciates substantially in the process of destruction. Consequently, the contribution of recent innovations to GDP is likely upwardly biased. This note calls for further research in innovation economics in order to

measure and decompose the effects of innovations into their creative and destructive portions in order to provide improved estimates of their contribution to GDP or to employment.

Keywords: Joseph Schumpeter, GDP, Capitalism, Employ.

JEL Codes: E23, E24, L26, P1

Resumen

El concepto de destrucción creativa, propuesto por Joseph Schumpeter como el motor del desarrollo capitalista, es bien conocido. Sin embargo, escasamente se reconoce que su parte destructiva constituye un costo social y económico y que sesga, por lo tanto, nuestro cálculo del impacto de la innovación sobre el Producto Interno Bruto, con la notable excepción de Witt (1996).

Se debe reconocer que durante la primera y segunda revoluciones industriales la magnitud del componente destructivo de la innovación fue sin duda pequeño, comparado con el valor agregado neto al empleo y al PIB que surgió del cambio técnico. No obstante, nuestra conjetura es que actualmente las nuevas tecnologías están creando frecuentemente productos que son sustitutos cercanos a los que remplazan, los que son devaluados considerablemente en el proceso destructivo. En consecuencia, la contribución de las recientes innovaciones tecnológicas al PIB está probablemente sesgada hacia arriba. Esta nota es un llamado a hacer más investigaciones en la economía de la innovación para descomponer los efectos de esta en sus partes creativas y destructivas, para así poder contar con mejores cálculos de su contribución al PIB o al empleo.

Palabras clave: Joseph Schumpeter, PIB, Capitalismo, Empleo.

Códigos JEL: E23, E24, L26, P1

Introduction

Joseph Stiglitz, the Columbia University Nobel Prize winner —arguably the economist with the broadest vision among living practitioners of the profession— popularized the notion of "GDP fetishism" (Stiglitz, 2015) in order to highlight the propensity of our culture to attach almost religious importance to GDP numbers instead of other (non-monetary) measures of welfare such as life satisfaction, happiness, longevity, school performance, poverty rates, or even incarceration rates. In fact, "disruptive innovation" is celebrated to such an extent that the Nobel Prize winning Princeton economist Paul Krugman thinks that it "glamorizes business" (Krugman, 2014). Given that economic growth is fueled primarily by innovation, behind the hype over GDP is a hype about innovation that permeates so much of our overarching mental attitudes. In 1942 Joseph Schumpeter, the Austrian-born Harvard economist, famously dubbed the process of innovation of larger-than-life entrepreneurs "creative destruction" that provided the mainspring of capitalist economic development. In his novel 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. 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. Thus, creativity in Schumpeter's conceptualization is at once constructive and destructive: evolutionary progress is not painless by any means. Not at all: there are not only gainers but also losers, as he himself recognized. Nonetheless, Schumpeter and all those who followed in his footsteps stressed confidently that creative destruction was, in the main, welfare enhancing in the long run (*Schumpeter, 1942, 2014)*. The goal of this essay is to argue that there are two sides to "creative destruction" (CD) and that the ideology of our Western societies is biased insofar as it focuses almost exclusively on the gainers and ignores the losers. Cheering and celebrating creativity while benignly neglecting its concomitant destruction. This attitude will not do any longer.

Creative destruction

The destructive (D) component of innovation —or that of the process of technological change— can be viewed as a negative externality —a cost that is imposed on third parties without their consent. Note that D can impact NNP, employment, or welfare and it can fall on producers or on consumers. An example of an externality that falls on producers is an innovation such as a camera built into a mobile phone (by firm A) that ultimately leads to the decline in demand for traditional digital cameras and the bankruptcy of Kodak Inc. (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 at time t = 1. Suppose that B's capital equipment loses all of its value, because it cannot be put to other uses and that many of its employees will not be able to find work in other sectors and therefore become unemployed. This implies a loss to the economy since these factors of production are no longer producing the $4 per annum that they did prior to the innovation. Hence, firm A's output of $10 is the creative component which we are fond of celebrating. However, the $4 destructive element —the negative externality valued at $4

a year— tends to be utterly forgotten. Hence, we celebrate the innovation as though it were worth $10 in spite of the fact that its actual contribution to NNP is $6, because in the absence of the innovation firm B would have continued to produce $4. Thus, overlooking the negative externality magnifies the importance of the innovation in our eyes out of proportion to its true contribution to NNP.

Another kind of externality is the kind that falls directly on consumers. In this version of CD the firm A introduces a new product that does not bankrupt another firm but instead unexpectedly renders a consumption good obsolete. The obsolescence can be planned or not; the depreciated good can be produced by firm A or another firm. Of course, 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. Thus, new versions of existing products frequently do not add a lot of net value to the consumers' welfare in proportion to the amount by which they increase NNP.

This strategy is immensely 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 as a status symbol, although the older one is still functioning well. Moreover, there are hidden qualities which are not apparent until one has some experience with the product. Then there is a tendency to force consumers to switch by not providing compatibility with connectors or programs and not providing support indefinitely. Microsoft often forces upgrading by making older file versions inaccessible and inoperative.

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. 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 or that we could have obtained in the absence of the negative externality.

Innovation's destructive power has been increasing

In his apotheosis of the innovating entrepreneur Schumpeter was undoubtedly thinking of the significant disruptive innovations associated with the First and Second Industrial Revolutions: the steam engines, railroads, steam boats, iron, steel, interchangeable parts, petroleum, chemicals, electrification, telegraph, telephone, radios, automobiles, airplanes, film making, paper making, plastics, rubber, and machines and engines of all sorts. The negative externality associated with these technologies was small or even negligible while the gains in productivity were humongous. The reason is that many of these were completely new products and some were general purpose technologies with substantial impacts on the productivity gains of other sectors that rippled through the economy. Moreover, all of them were capable of capturing economies of scale previously undreamed of and all satisfied a basic need innate to human nature so consumers did not need much convincing to adopt the new products.

Most importantly, the non-mechanized firms that were replaced were generally small-scale operations working with little capital. What's more, the new technologies mentioned above used labor on a massive scale so that the workers displaced by the innovations could easily find employment in the new sectors of the economy as skills were transferable across industries. Hence, the destructive force of those innovations was not only small but waned in significance relative to the creative component.

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 enormous. The destruction of the kerosene lamp industry was not a major loss to the economy. Similarly, the telephone was a new technology that replaced nothing but the pigeon carrier and perhaps some mail. Hence, the gains in productivity were gigantic. Clearly, the closer is the substitutability between the new and the old product (or the new and old ways of doing something) the higher is the negative externality. However, during the First and Second Industrial Revolutions the degree of substitutability between the new and the old products was very low or even non-existent, implying that the creative component of innovation must have been extremely high relative to the destructive component. However, that is no longer the case.

Welfare and creative destruction: past, present and future

However, by the end of the 20th century the destructive component of innovations has increased substantially for several reasons. Recent innovations have had substantial substitution effects between the new and the old products. The iphone5 is a very close substitute of its predecessor iphone4 and Windows 8 is also a very close substitute of Windows 7. That meant that the incremental gains produced by the innovation tend to be tiny. Another reason is that all our innate basic needs have been satisfied with the already existing technologies so that firms have to expend much more money on marketing in order to induce consumers to buy the new products. Thirdly, the old products were already produced by modern firms efficiently on a large scale so that gains due to economies of scale were not forthcoming. 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 productivity, employment, welfare, or NNP by leaps and bounds as in previous centuries. Consequently, the benefits reaped from creative destruction —net of the negative externalities— have declined substantially over time and is likely to remain at a low level.

Consider that tablet computers expanded at the expense of laptop computers; Wikipedia destroyed *Encyclopaedia Britannica*; 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), while in 2014, after emerging from bankruptcy, it has a skeleton workforce of 8,000. 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.

In contrast to the peak employment at Kodak, 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". Consider 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); at the same time, however, the number of jobs in the newspaper publishing industry was halved from 424,000 to 212,000. 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. Many newspapers succumbed to bankruptcy such as the Tribune Company and the Sun-Times Media Group. 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, 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, with total advertising revenue remaining unchanged.

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. It monetized activities that were for the most part left previously outside of the market's purview. 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. Besides, Facebook has merely 7,000 employees.

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 are not likely to satisfy a basic need that is not already satiated. Therefore, it appears that 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", the driverless car, or drone delivery. 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. Furthermore, they all will destroy jobs in large number.

So far we have been discussing the immediate destructive negative externalities of innovation but there are longer-term ones as well which are not directly evident. Joel Mokyr, the distinguished historian of technology at Northwestern University, acknowledges that technological change is by no means a free lunch; one needs to consider the "bite-backs" as

well. 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. Thus, we should subtract these unanticipated costs from the NNP figures. That would give us a much better sense of economic performance and improve our ability to frame policy going forward.

Furthermore, not all innovation enhances productivity as many are designed for rent seeking purposes. That is also Paul Volcker's assessment of the innovations associated with the financial crisis. The myriad of so-called financial innovations culminated in an immense "bite-back" which added up to about $7 trillion support from the government and an annual loss in output in the U.S. alone of about $1 trillion.

Another often neglected controversial aspect of technological change is that it is not at all democratic, insofar as entrepreneurs impose their will on the society and thereby redistribute income. It is inconsistent that we celebrate such a process even though it hurts people by redistributing income while at the same time we generally argue against the government redistributing income for exactly the same reason, i.e., that the redistribution hurts the people who are taxed. It is not at all clear from what derives these privileges of the entrepreneur that do not accrue to the community as represented through the government?

This is a major incoherency in economic theory and we need to think about laws and institutions that will protect those who are in the danger of being hurt. The goal of such institutions would be to ensure that the suffering of the losers would be minimized in the process of creative destruction. The immense destructive forces of the financial innovations should provide a powerful incentive to develop institutional mechanisms to assess the riskiness of innovations and to foster those innovations that minimize the amount of pain it produces in the economy. After all, 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 desirability. Several European countries have come to the rescue of local bookstores by limiting the amount of discounts that Amazon is allowed to grant as a defense mechanism of Amazon's destructive forces. Other such policies could be and should be developed. 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. This is an example of economic growth that attempts to minimize the destructive forces and should be more widely adopted.

Conclusion

In sum, creative destruction has become more destructive than ever before. Yet, we live in a culture that continues to celebrate the "gospel of innovation" without acknowledging forthright the deleterious effects of the concomitant negative externalities or caring much about the suffering they cause. Yet, innovation's net value added to NNP, to employment, or to welfare —net of the negative externalities— has diminished substantially by the 21st century. The destructive forces of creative destruction have gained the upper hand. The implication

is that instead of innovation fetishism we should scrutinize seriously the extent to which a particular innovation will improve the human condition before it is allowed to unleash its destructive forces. Given the kind of innovations in the pipeline this trend is most likely to continue.

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 implies that the process will, or should, continue indefinitely. No such economic law exists and the historical record indicates that there are times when economic regimes reach a tipping point and abruptly change direction. That is exactly what our economy has done. It is time to acknowledge it.

The increase in the destructive forces of innovation dovetails with several pessimistic prognoses of the future of the US economy, insofar as many prominent economists are arguing that economic growth is going to be slow into the foreseeable future. Harvard economist Larry Summers suggests that the economy has morphed into one of secular stagnation on account of inadequate aggregate demand (*Summers, 2014),* while Krugman has been blaming pervasive political dysfunction for our malaise, and Stiglitz points to pervasive inequality as the culprit. Moreover, Northwestern economist Robert Gordon points out that slowdown in the growth in labor productivity since 1972 is another reason to be pessimistic about our future economic prospects (Gordon, 2012), 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% which will be very difficult to distinguish from zero. In other words, the post-industrial service economy is going to be stuck in low gear as far as the eye can see.

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 select 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 as technological unemployment is going to be an endemic problem from now on as the MIT economists Erik Brynjolfsson and Andrew McAfee suggest (Brynjolfsson, McAfee, **(**2014). 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 implies that GNP growth has been decoupled from employment. Low-skilled workers —and there are many of them— are becoming increasingly redundant through automation; hence, endemic underemployment is here to stay.

According to the University of Texas economist James Galbraith, the best is behind us as we have entered a new age of a new normal that will resemble more closely the social structure of the *ancien regime* than that of an ephemeral ideal economy. We have argued similarly that there has been a shift in the destructiveness of new technologies and this effect has so far not registered adequately in the economic statistics that we use to gauge the performance of the economy and to formulate policy.

Thus, we need to pay more attention to the destructive forces of new technologies. The "low hanging fruit" have been picked so that the negative externalities of innovations have been increasing. Yet, these negative externalities are not adequately understood by the public or

by policy makers or by the media 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 stark contrast to previous epochs. Creative destruction's gentle winds have mutated into cyclones of destruction. Thus, our life satisfaction will probably be decoupled from even the slow economic growth being predicted by Gordon and Summers. While the economy will be growing, albeit slowly, our sense of well-being will be mysteriously lagging well behind unless we are able to tame the destructive forces of Schumpeter's gale.

References

Brynjolfsson E, Andrew M. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies,* New York: W.W. Norton & Company.

Galbraith, J. K. (2014). *The End of Normal. The Great Crisis and the Future of Growth*. New York: Simon and Schuster.

Gordon, R. (2016). *The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War.* Princeton: Princeton University Press.

Gordon, R. (2014). The Demise of U.S. Economic Growth: Restatement, Rebuttal, and Reflections. NBER Working Paper No. 19895, February.

Gordon, R. (2012). Is U. S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds. NBER Working Paper 18315, August.

Krugman, P. (2014). *Creative Destruction yada-yada* . Available from: http://krugman.blogs.nytimes.com/2014/06/16/creative-destruction-yada-yada/?_r=0

Schumpeter, J. A. *(1942)*. Capitalism, socialism and democracy . New York: Harper.

Summers, L. *(2014a)*. U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound, *Business Economics 49*(2), 65-73, doi:10.1057/be.2014.13

Summers, L, (2014b). Low Equilibrium Real Rates, Financial Crisis, and Secular Stagnation. In M. N. Baily and J. B. Taylor (eds.). *Across the Great Divide: New Perspectives on the Financial Crisis,* Hoover Institution, Stanford University, 8, pp. 37-50.

Stiglitz, J, (2015). *Report by the Commission on the Measurement of Economic Performance and Social Progress.* Available from: http://www.insee.fr/fr/publications-et-services/dossiers_web/stiglitz/doc-commission/RAPPORT_anglais.pdf

Stiglitz, J. (2012). *The Price of Inequality: How Today's Divided Society Endangers Our Future*. New York: W.W. Norton.

Stiglitz, J., Sen, A. and Fitoussi, J-P. (2010). *Mis-Measuring our Lives. Why the GDP Doesn't Add up*. New York: New Books.

Stiglitz, J. (29009). GDP Fetishism. *The Economists' Voice 6*(8), 1-3.

Tanner, E, (1996). *Why Things Bite Back: Technology and the Revenge of Unintended Consequences.* New York: Knopf.

Witt, U, (1996). Innovations, externalities and the problem of economic progress. *Public Choice* 89, 113-130.