

# **“Innovation, growth and welfare: from creative destruction to destructive creation”**

**SPRU DIG-IT workshop:**  
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## ***1. Technological progress, innovation and the generation of new wealth.***

What has characterized the innovation literature over the last twenty years or so, as the concept became fashionable amongst policy makers and the business community alike, has been the positive image which has become associated with the concept. Just like the old Guinness advert, “Innovation is Good for You” appears actually the common feature of most innovation studies over the last decades. In the Guinness case though, this was actually correct. A pint of Guinness a day compares to an aspirin a day in the prevention of blood clots and the risk of heart attack. Unlike other beers, Guinness contains antioxidants like those found in red wine and dark chocolate<sup>2</sup>. In its wisdom, Guinness though decided to stop its “good for you” marketing campaign in Ireland which had primarily consisted of offering free beer to blood donors in blood donor clinics<sup>3</sup>. The company did not want to be identified with a health company. Maybe innovation scholars should do the same thing... The slogan “Innovation is Good for You” as it has been underlying many business and policy analyses remains surprising given the fact that innovation failure rather than innovation success appears the most common feature of innovation studies.

At the macro-economic level too, innovation has over the years increasingly been accompanied with a positive aura, contributing or bringing about sheer naturally improvements in a country or region’s (international) competitiveness. Again this is to some extent surprising given the historical tradition in the economic literature on the sometimes particularly destructive nature of new technologies and innovation processes: destructive in terms e.g. of employment and skills. Since more or less the beginning of the industrial revolution, (social) scientists have expressed fears that machines would abolish jobs. In the early 19th century Fulton's steam boat attracted the wrath of ferrymen, and the Luddites treated Jennies and looms as sworn enemies. In the 1940's Norbert Wiener<sup>4</sup>, the father of cybernetics, forecast that computers would bring about a crisis worse than the Great Depression of the 1930s. In the 80’s, the spectrum of mass unemployment became, at least in Europe, associated with microelectronics<sup>5</sup>. In the 90’s the OECD launched, the Jobs Study (1994), which contained a specific section on technology, productivity and employment creation which highlighted the many trade-offs involved<sup>6</sup>. And over the last decade, the employment creation potential, or rather lack thereof in Europe, was a central concern in Europe’s so-called Lisbon strategy; a strategy which tried to merge social policies with innovation policies but which in its implementation became ultimately heavily biased towards innovation and R&D.

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<sup>2</sup> See Mann LB and JD Folts (April 2004). "Effects of ethanol and other constituents of alcoholic beverages on coronary heart disease: a review". *Pathophysiology* **10** (2): 105–12. [doi:10.1016/j.pathophys.2003.10.011](https://doi.org/10.1016/j.pathophys.2003.10.011). PMID 15006416.

<sup>3</sup> Irish Times, 22 March 2010

<sup>4</sup> For those interested, Norbert Wiener’s original letter to the Union of Automobile Workers worth reading is now also digitally available. See <http://libcom.org/history/father-cybernetics-norbert-wieners-letter-uaw-president-walter-reuther>.

<sup>5</sup> see e.g. Clive Jenkins and Barrie Sherman’s *Collapse of Work* published in 1979 predicting 5 to 6 million unemployed in the UK in 2000, today at 2.49 million.

<sup>6</sup> OECD, 1996 <http://www.oecd.org/industry/industryandglobalisation/2759012.pdf>

The implicit assumption behind the pessimistic claims about new technologies and innovation was that there would be a fixed amount of output to be produced. What was not taken into account was that technological progress could generate new wealth; such increased wealth would lead to higher effective demand, causing itself increased investment and labour hiring in order to satisfy this increased demand through the production, distribution and sale of new products and/or services. Thus whereas in the short term, technical progress might destroy jobs the increase in productivity and in disposable income would lead to increases in effective demand and so eventually also to the creation of new jobs. More accurately, given the various other factors that complicate this process, technical progress would and has been the case throughout history raise total income. From a traditional economists' perspective what people would need, with the exception of workaholics, would be income not jobs *per se*. While 'jobs' is often a shorthand name for 'income'; whether most people will effectively partake in enjoying parts of this higher total income – in terms of more/better jobs, or through redistribution schemes – depends on the economic framework and in particular the functioning of the labour market, not on technology.

Particularly with respect to the uptake of new digital Information and Communication Technologies (ICTs) since the mid-nineties, both the evidence from OECD countries as well as from EU countries suggested that countries experiencing the greatest slowdown in productivity growth (often technology-driven) also experienced the strongest rise in unemployment. As a matter of fact, the more recent evidence with respect to the very different uptake of ICTs between EU member states belonging to the Eurozone, suggests that the differentiated use and innovation with respect to ICTs provides today one of the most significant “real economy” explanatory factor behind the euro-crisis in southern European countries.

To reduce the debate about the job creation versus job displacement features of the introduction of new technologies, just to the speed by which innovation is being introduced, ignores though some of the more fundamental question about the nature of technological progress and innovation, the focus of this paper.

Indeed, could it be that at the broader societal level, innovation and the introduction of new technologies do not always represent Schumpeterian processes of “creative destruction”, as described above? I.e. processes which are likely to renew society's dynamics leading to higher levels of economic development and welfare – destroying a few incumbents to the benefit of many newcomers –, but rather represent now and then a dynamic process of the exact opposite nature: a process of what I called in the 2011 Marie Jahoda lecture<sup>7</sup> at Sussex University “*destructive creation*”. Innovation benefitting a few at the expense of many with as a result a pattern of a long term reduction in overall welfare, productivity and ultimately employment growth.

## ***2. Innovation and wealth destruction: from “creative destruction” to “destructive creation”***

A common feature to “*destructive creation*” innovation appears to be not just its short-termism and its easy, free rider nature, but particularly its dependency on networks whereby the

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<sup>7</sup> See Soete, L. (2012), “Maastricht reflections on innovation”, *UNU-MERIT Working Paper* [2012-001](#)

regulatory framework governing the network provides sometimes the major source for innovation. And not surprisingly, the core reason why such patterns of “destructive creation” appear to have blossomed over the last ten to twenty years is also closely related to the advent of the ICTs. ICTs have allowed for a dramatic growth in opportunities for the fragmentation of service delivery: what has become known as the long tail of product and service delivery differentiation<sup>8</sup>. And there is little doubt that doing so ICT has had major growth and welfare increasing effects. It has allowed to satisfy consumers’ wants practically along the full demand curve. As a result many consumers who before could not afford a whole range of services, can now consume those at much lower prices. New “versions” of services have emerged and have been behind the rapid growth of many new varieties of services.

However, in some areas, in particular networks services, the emergence of such service differentiation has also led to opportunities for cherry picking: for selecting those, on their own, most profitable segments of demand which were essential though for the “full” service delivery. As a result, many features of “universal service” delivery associated with the previous network service delivery have come under pressure. Their quality of delivery has become of lower quality or in the worst case has even become discontinued. In network services it has increasingly become expensive to be poor.

At the same time, existing network regulators were neither well-prepared nor informed about the many new digital opportunities. On the contrary deregulation and/or liberalisation led to new products or service delivery, inspired by the change in regulation, and exploiting more fully the new digital opportunities of product differentiation with in some cases negative societal externalities or even systemic failures.

Economists, and social scientists more generally, seem to have not been sufficiently forthcoming in highlighting the limits of innovation in sectors where forms of “destructive creation” appear much more common than usual forms of creative destruction. Colleagues in the Science and Technology Studies community, by contrast, did have a well-documented framework in which they explicitly looked at some of the possible negative externalities of technical inventions. Actually the Offices of Technology “Assessment” (and Forecasting) set up in the US and Europe in the sixties and seventies had been created with this purpose in mind. But over time these technology assessment analyses developed further outside of the economics profession, and innovation assessment never emerged<sup>9</sup>.

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<sup>8</sup> See Anderson, C. (2006), *The Long Tail: Why the Future of Business Is Selling Less of More*, Hyperion Books.

<sup>9</sup> As Paul David put it in a set of provocative comments which run in a very similar direction to those presented here, but more directed towards the “economics” innovation profession: “The optimum rate of innovation for an economy, or a social organization is a notion that rarely is discussed, except by implication which has left it poorly defined. Yet, unless this concept somehow was implemented and thereby operationally defined, how could one claim to judge whether the pace of innovation currently prevailing in a given branch of industry or sector of the economy was too slow, rather than just right or too fast? By contrast, the optimal rate of Harrod-neutral technical change and hence the optimal steady-state rate of labor productivity growth is nicely defined, at least for certain familiar classes of growth models; and, in the literature on the economics of R&D the question whether we have too much or too little (R&D) input into the processes of research and invention is frequently asked and answered empirically. Why should not excessive innovation be acknowledged to be just as much a possibility as is excessive investment in scientific research, or in industrial R&D?” (David, P. “Introductory comments on Innovation Incentives, Institutions and Economic Growth” in Lerner, J. and S. Stern (Eds), *The Rate and Direction of Inventive Activity Revisited*, Proceedings of a Conference held on September 30 - October 2, 2010, University of Chicago Press (forthcoming).p.3).

A large literature on the economics of innovation highlighting cases of technological failure emerged in the late 80's inspired by Brian Arthur and Paul David's notion of the possibility of a long term "locking in" of society in technological inferior trajectories<sup>10</sup>. And similarly one also knows since the 80's and 90's that at the policy level there are numerous conflicts in the design of innovation policy between innovation support and the speed of diffusion as highlighted by amongst others Paul David and Paul Stoneman<sup>11</sup>.

Here though, I would like to look more closely at the way innovation in consumer goods<sup>12</sup> might have led our societies to a long term conspicuous consumption path of innovation led "destructive creation" growth. In most modern growth models, the decision to invest in research and development is driven by the prospect of monopoly profits on the incremental value that new vintages provide. In short, and as expected innovation goes hand-in-hand with value creation. Yet one can also imagine exactly the opposite pattern: a process in which innovation destroys the usage value of the existing stock of durable goods to such an extent that as a result it induces consumers to repeat their purchase more rapidly. Emilio Calvano<sup>13</sup> from Icier - Bocconi University developed a formal model illustrating the widespread nature of such a phenomenon. Let me briefly quote from his paper: "*By allowing innovation to affect the value of the existing stock of durable goods, we highlight the role of destruction rather than creation in driving innovative activity. The formal analysis shows that destructive creation unambiguously leads to higher profits whatever the innovation costs. On second thought this shouldn't come as a surprise. If the "problem" from a profit maximizing perspective, is the durability of the output then it follows that any (cheap enough) mechanism that reduces or eliminates it would put the monopolist in a stronger position (i.e. 'closer' to the rental outcome). The power to "wreck" the value of old versions of a product ends up serving much the same purpose and hence the profit restoral.*" Of course, this destruction of others' monopolies may happen to the destructive creator later, but the point is that there is no mechanism to take into account the optimal timing of innovations in regard to the destruction costs of all sorts of affected capital.

The analysis presented by Calvano highlights the fact that the phenomenon of "*destructive creation*", as described above, is rather widespread. Easy and cheap ways in which existing usage value can be destroyed is through e.g. product design and restrictive aftermarket practices, and in the extreme case through so-called "*planned obsolescence*" limiting on purpose the life span of particular consumer goods<sup>14</sup>. Probably the most widespread case is new product design in e.g. fashion clothing or shoes<sup>15</sup> destroying existing output, but there are many other forms and

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<sup>10</sup> See amongst others Arthur, B. (1989), "Competing Technologies, Increasing Returns and Lock-in by Historical Events," *Economic Journal*, 99, pp. 106-131; David, P. (1985), "Clio and the Economics of QWERTY", *The American Economic Review*, May, Vol. 75, No. 2, Papers and Proceedings, pp. 332-337, and David, P. (2001) "Path Dependence, Its Critics and the Quest for 'Historical Economics'", in Garrouste, P. and S. Ionnides (Eds.), *Evolution and Path Dependence*

<sup>11</sup> See David, P. (forthcoming as in footnote 8) and Stoneman, P. (2001), *The Economics of Technological Diffusion*, Wiley-Blackwell.

<sup>12</sup> In the Jahoda lecture (Soete, L. (2012), op.cit.), I also looked at financial innovations and institutional innovations such as the euro as typical cases of destructive creation innovation.

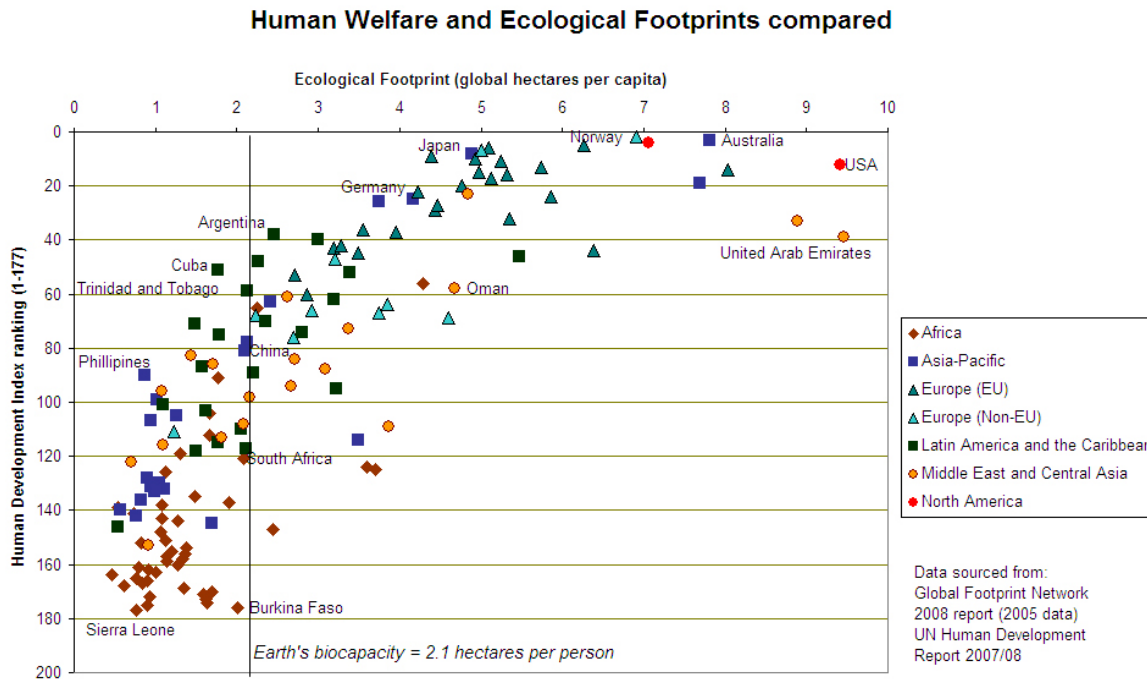
<sup>13</sup> Calvano, E. (2010) "Destructive Creation", *SSE/EFI Working Paper Series in Economics and Finance*, No 653, December.

<sup>14</sup> See e.g. the legal case brought against Apple in 2003 with respect to the planned obsolescence of the battery life of the batteries in the iPod.

<sup>15</sup> The Imelda Marco syndrome as Paul David put it: "The near pathological impulse to push the rate of innovation to be ever-faster needs a medical psychiatric designation, and I propose to refer to it as the innovation fetish's "Imelda Marco syndrome" – in memory of a famous instance of the uncontrollable, obsessive accumulation of more and more pairs of women's shoes (another,

sorts of restrictive aftermarket practices which can be found in many ICT related sectors such as software writers limiting backward compatibility, or electronic goods manufacturers ceasing to supply essential after-sales services or spare parts for older products. Not to mention smart phones, mobiles, iPods or iPads. It is actually surprising in how many areas processes of “*destructive creation*” exist that hinder prolonged usage and induce customers to migrate continuously to newer models.

Elsewhere, I have argued how this “*conspicuous innovation*” consumption growth path which in its environmental impact and ecological footprint will be unsustainable in the developed world and increasingly so in the rapidly emerging country world, and warrants ultimately a shift in the process of research and innovation.



Source: [http://en.wikipedia.org/wiki/File:Human\\_Development\\_vs\\_Ecological\\_Footprint.jpg](http://en.wikipedia.org/wiki/File:Human_Development_vs_Ecological_Footprint.jpg)

In many ways and as highlighted in the Calvano model, the focus of industrial research and innovation has been on continuous quality improvements of existing and new consumer goods, enlarging continuously the demand for such quality improved or new consumer goods. It formed the basis of the growth model as it emerged over the post-war period in the US, Europe and Japan which generated its own infinite demand for more material consumer goods: a continuous growth path of rising income with increasing consumer goods’ production *and* consumption<sup>16</sup>. The continuously rising industrial R&D efforts in high income countries appeared to match perfectly the continuously rising incomes of the citizens of those countries leading to a continuous enlargement of their consumption basket with new, better designed or better

richly documented fetish object).” See David, P. “Introductory comments on Innovation Incentives, Institutions and Economic Growth” in Lerner, J. and S. Stern (Eds), op.cit.

<sup>16</sup> See also Pasinetti, L. (1981), *Structural Change and Economic Growth: a Theoretical essay on the dynamics of the wealth of nations*, Cambridge University Press.

performing products. The initial demand for such quality improvements often arose from extreme professional, sometimes military use circumstances, but thanks to the media – which typically would emphasize the prestige image of such professional use using symbol figures such as sport athletes or movie actors – the average, non-professional consumer could easily become convinced that he or she was also in need of new goods with such technologically sophisticated professional quality characteristics even though those characteristics might ultimately add only marginally to one's utility.

In a certain way the highest income groups in society, the “*tip*” of the income pyramid, acted often as first, try-out group in society, contributing happily to the innovation monopoly rents of the innovating firm. So a continuous circle of research was set in motion centring on the search for new qualitative features<sup>17</sup> to be added to existing goods. As highlighted above in Calvano's model this “*professional-use driven*” innovation circle has been the main source for extracting innovation rents out of consumer goods – ranging from consumer electronics, sport goods, shoe wear, household equipment, computers, mobile telephony, medical diagnostics, sleeping comfort, and so on – with a “too long” *physical* life time.

As is obvious from this example of “destructive creation” as well as from the others not discussed here<sup>18</sup>, ultimately the likely impact on employment and job creation will be more like the mirror picture of the one associated with traditional, Schumpeterian process of creative destruction innovation, as described above. Now, the process of short term job creation associated with the process of destructive creation will be ultimately unsustainable, and have a long term negative impact on long term job creation and long term welfare.

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<sup>17</sup> One may think of audio and sound, vision and clarity, miniaturization and mobility, weight and shock/water resistance, feeling and ergonomiticity, etc.

<sup>18</sup> Such as “financial” innovations and the “euro” as institutional innovation discussed in more detail in Soete, L. (2012), op.cit.