

The relation between entrepreneurship and smart economy

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Abstract: Entrepreneurship is a catalyst for the economy, both in terms of capital inflows and the perspective of sustainable development. To promote entrepreneurship, both aspects of logistic- base infrastructure, finance, investment process- and socialistic - multiculturalism, cultural heterogeneity, linguistic, religious- is an efficient and sustainable method to satisfy needs and development by exploiting local opportunities to present them as a way of life, adapted to the requirements and consumer demands. These aspects imply production, allotment and marginal distribution generated by the market and/or the dynamics of resources.

Key words: entrepreneurship, sustainable, economic growth, economic contraction, quality of life

Introduction

Un-materialization of economies is probably the main feature of the IST (Information Society Technology) and it is characterized by detachment from the industrial economy and the translation to the information economy, using innovation and research within all business processes, from domestic repetitive activities, to security services or operations of identifying disturbing factors in the managerial act. If the main contribution of IST / ICT (Information and Communication Technology) is demonstrated by efforts of economies to increase the stock of intangible capital and to restructure and im/ un-materialization is not inherently eco-efficient and / or sustainable, but tends to generate unintended effects as the rebound effects. In relation to the un-materialization of production, we favor immaterialization paradigm „as a switch in consumption behavior from more material to less material”.

Literature review

Un-materialization (alternative *Immaterialization*) is probably the main economic path of XXI century. The economic trend seems oriented towards growth of intangible capital stocks (van Ark and Hulten 2007), however investments in ICT (Information and Communication Technology) meet a real boom in the 90s -2000. Nowadays we know for example that the catching up rise type from the 90s / 2000 of CEE economies is related to restructuring due to investment in information technology (van Ark and Piatkowski 2004; Apostol, Balaceanu, and Padurean 2011) and that intensive sectors users of

ICT are behind the divergent growth of US to Europe (O'Mahony and van Ark 2003). Globally, the steep decline of prices and advances of globalization have facilitated the transfer of technology to emerging economies and the contribution of ICT nearly doubled, from about a quarter to a third of the total capital between 1995-2000 (Jorgenson and Vu 2009). Thus, economists have seen in knowledge and new technologies the main answer to the problems of development and sustainability (Chichilnisky 1997, 1998; Yamamichi 2011; Qiang et al 2012; Pascu, Nedeia, and Milea 2012). For them, economies based on the enhanced stocks of information and / or intangible capital tend to be less dissipative. Main arguments of economists are probably related to the ability of immaterial economies to provide increasing returns; by comparison, conventional economies are more material based on the accumulation of factors (technology being incorporated) and obviously dissipative. The theory of increasing returns likely provided for the first time the possibility those economies to be able to continue to grow without the need to expand the stock of physical capital and / or energy / resources consumption. The emergence and extension of information and communications technology (ICT) between '90 -2000 only revived interest in growth based on the generation and use of knowledge and / or massive accumulation of intangible capital. For economists, the great hope was to encounter problems in sustainable and eco-efficient (eco-efficiency) development, ie „by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout its life cycle, to a level at least in line with the Earth's estimated carrying capacity” (Willard and Halder 2003).

Methodology

The approach of the paper is argumentative, using as research methods cause-effect analysis, logical reasoning, historical method. Data presentation is designed to highlight the importance of logical, argumentative constructions.

The influence of Rebound effects on smart economy

The question that remains is related to the ability of economies that dematerializes (by enlarging the stock of knowledge and / or intangible capital) to meet the problems of development in a sustainable way. In other words, information society technology is environmentally friendly technology? Do ICT and Internet meet development issues in terms of eco-efficiency? Discussions in the last ten years show that substitution of informational products and services for products and services with material content and prices decline are not devoid of problems, generating the so-called rebound effects. The main significance of rebound effects is that information products tend to generate, through positive feedback mechanisms, loss of eco-efficient gains from reduced material consumption and / or costs. In other words, if ICT and generally, dematerialization, reduce material consumption in the production of goods and services, on the contrary the economic trend is becoming unsustainable by reducing costs and / or inherent increase consumption (Tulbure 2002; Schauer, 2002, 2010). The main problem of the IST (Information Society Technology) is to overcome the so-called rebound effects in a way that will boost earnings in eco-efficiency, not reduce them. We explore an alternative in sustainable development starting from benefits of IST and / or im / dematerialization. Thus, we distinguish between dematerialization and Immaterialisation in the line of Simmons (2002) and Juric and Voegel (2005) to indicate that the virtualization of economies should be correlated with the values and lifestyle of the consumer (a switch in consumption behavior from more material to less material) so that society can benefit from eco-efficient gains of the information society and / or become sustainable.

By strengthening linkages between IST and immaterial economy it is being developed the concept of „smart economy”, a form of economy where knowledge becomes the main tool, information technology and innovation are the methods of growth, with the aim of maximizing the utility by maximizing consumer's lifestyle .

„Smart Economy” is a concept both of the present and of the future because refers to policies that stimulate innovation and creativity combined with scientific research, superior technology and care for the environment, through the concept of sustainability. Either approach represents a gain for the contemporary economy, generally for economic subjects, on condition that popularizing the term fulfills the spatial, temporal and acting conditions.

Advantages / disadvantages of IST (Information Society Technology)

IST / ICT is generally associated with the productivity boom especially in services, with development in infrastructure and in employment / labor quality, with catching-up leaps in emerging economies in the years 90-2000 (van Ark and Piatkowski 2004 Apostol, Balaceanu, and Padurean 2011; Apostol 2011). A quasi common description is that „revolutionary potential of new ICT lies in their ability to instantly connect vast networks of individuals and organizations across large geographic distances at very low costs. As such, ICT have been key catalysts of globalization, facilitating global flows of information, capital, ideas, people and products. They have transformed businesses, markets and organizations, they have revolutionized learning and knowledge sharing, they have empowered citizens and communities, and they have created significant economic growth in many countries. ICT amplified brain power in much the same way that nineteenth-century industrial revolution amplified muscle power” (Essentials 2001).

Other studies emphasize the potential of ICT for development in emerging economies. Yamamichi (2011) shows that ICT provides the information easier and faster, it creates information exchanges and networking, it generates transparency and efficiency in processes, it transforms people's lives and contributes to the decentralization of decision (Isăilă, 2012). For example, if social networks and telecommunications have played a crucial role in the revolutions in Tunisia and Egypt and are a channel through which disadvantaged groups can express, “social media can be an effective tool to make a contribution to social development by achieving inclusive institutions, cohesive societies, and accountable institutions, with which it had been difficult for people to be equipped when social media was not widely available” (p.11). Similarly, Qian et al (2012) argues that mobile telecommunications locally create opportunities for economic growth, social empowerment and innovation in developing countries. For him, “One of the areas with the greatest potential impact is in the contribution that mobile applications can make to agricultural and rural development (ARD), by providing access to information, markets, and services to millions of rural inhabitants. For both agricultural supply and demand, mobile phones can reduce waste, make delivery more efficient, and forge closer links between farmers and consumers”.

More comprehensive Willard and Halder (2003) reference to near insights of information society and sustainable development and find out those six scenarios with different approaches to the problem can be identified. Some emphasize on development other on im / dematerialisation, some on the advantages of applying the IST, others rather on the disadvantages. Isolation and / or unrelated evolution of development, environmental sustainability, IST-s etc. objectives, policies and / or vocabulary (and methodology) is probably the main source of problems and disadvantages.

We focus on the main dis/advantages of IST (*Information Society Technology*) im/dematerialisation and consumer's lifestyle. Among the advantages of economic dematerialisation

we identify eco-efficiency in reducing paper consumption (massive cuts of CO₂) savings in the service, as is the introduction of online banking, substitution and efficiency of transport, for example by introducing the so-called telework or Internet delivery of media products, high efficiency in industry and constructions, which can mean savings, which means only e-commerce and business to business transactions of 4-5 billion euros and, finally, the efficiency of production planning, for example by taking the supply chain by Internet, reducing inventories; decrease in overproduction, unnecessary expenditure of capital, paper-based transactions and errors in achieving orders finally IST achieves a higher output with less energy consumption (Willard and Halder 2003). On the contrary, the disadvantages are directly related to the impact of rebound effects and to lifestyle and socio-cultural values. Schauer (2002, 2010) and Willard and Halder (2003) mention two types of effects directly relevant to unintended effects of IST: primary and secondary effects rebound rebound effects. Both describe the failure of the economy to decouple GDP growth of unsustainable consumption and production processes. If rebound effects generally means unsustainable growth derived from cost reduction, primary rebound effects show the negative impact of IST / ICT both on deposits of precious metals (component side) and on the ecosystem resulting from their disposal (e-waste). Thus, the rapid global expansion of consumption and utilization of ICT becomes unsustainable, for example if the satisfaction of consumption growth has the effect of reducing the ecological footprint of 2.3 hectares per capita to 1.9, requires in exchange an increase in the use of ICT that exceeds the eco-efficiency achieving limit (Willard and Halder 2003).

Secondary rebound effects mean that cost savings and eco-efficiency gains derived from the expansion of IST have unintended consequences: cost reduction through economic dematerialization make available savings in the economy translated into increasement in consumption of products, services and / or energy / resources, obviously with loss of earnings in eco-efficiency (Simmons 2002; Willard and Halder 2003; Tulbure 2002 Hoorens et al 2004).

Enterprise policy approach in the context of smart binomial economy rebound effects involves identifying those activities that support development by reducing material consumption and creating lifestyle through exclusive use of new technologies and innovation.

Immaterialisation and dematerialisation: rebound effects

The main problem of economic virtualization / dematerialisation is the so-called rebound effects. ICT / IST increases gains in eco-efficiency when the consumption of raw materials in the production / supply of goods and services decreases, but generates redundant rebound effects when lowering costs savings that stimulate overall growth in consumption (i / material). The main aim is to see whether the benefits of virtualization of IST can provide eco-efficiency gains that can be preserved, developed and / or expanded with the global expansion of IST.

Two paradigms are proposed: the paradigm of dematerialization and materialization model. Cloudy (2002), Schauer (2002, 2010) and Simmons (2002) argues for the difficulties dematerialisation model. Cloudy (2002) argues that the use of ICT does not ensure environmental sustainability. The argument is that the rebound effect is directly dependent on the behavior of each user of IT applications. In other words, e-worker has the advantage of less travel to work, but this advantage can be easily resolved by larger distances that he must cross (e-working specifically facilitates the work away). However, the results seem to support this position, for example if your e-working decrease net energy consumption in the first and most relevant of the scenarios, the decrease in total traveled

kilometers is constant; results are similar for CO₂ emissions: if the total energy is constant, CO₂ emissions do not decrease, but remain constant; calculations include Germany.

Schauer (2002) finds that the hypothesis of dematerialisation of the economy (or substitution) has not been sufficiently addressed and believes that it functions as a Pandora's box, however it is not a win-win solution that provides economic growth and jobs and environmental benefits at the same time. For him, there are primary / secondary rebound effects, and they relate directly to eco-efficiency of the information society in resource consumption (component side), electronic waste disposal etc, and the changes that are induced by the consumer's lifestyle, rather with increasing consumption of resources and energy than decreasing. The main argument is that if the dematerialisation hypothesis (substitution hypothesis) is plausible when promising to virtualize different products and material services, eg replacing physical conferencing with virtual conferences, document paper with the electronic format (cyberworld Scenario), it is likely that the eco-efficiency effect to be offset by the fact that ICT has a positive feedback in the industrial production (addition hypothesis), stimulating what he used to call „our endless hunger for new products” The positive feedback from industry and consumer's eco-schizophrenia, a concept that we introduce to emphasize lifestyle's role in eco-efficiency virtualization equation, which allows Schauer to see how consumers can remain in overwhelming proportions unaffected by environmental conclusions they support, seem to open a real Pandora's box. Schauer (2002, 2010) also argues that efforts to reduce energy and resources consumption can cause what he calls democratic brake (opposing of people affected by measures to reduce consumption of energy and raw materials) or that investment in information society's infrastructure can generate what he calls the Internet refuses, a category of people who refuse to convert to a digital world and to its advantages due to high infrastructure costs. That would require Europe to develop various infrastructures (double infrastructure).

Instead, Simmons (2002) argues for the introduction of a difference between the paradigm of immaterialisation and the perspective of dematerialisation, even if Immaterialisation was understood as a kind of Dematerialization (Hoorens et al 2004). For Simmons, „consumption patterns arise from the values and preferences of Individuals. IST-pull addresses the issue of preferences. There is a well-evidenced house that „long-term value change results from generational replacement”. It seems reasonable to infer, therefore, long-term lifestyle change That Will exhibit the same characteristic dependence on generational succession”.

There is a problem that Simmons sees here, that the benefits of immaterialisation are not irreversible (post-immaterialisation effects), so that they can be reversed by election mechanism, which is included in nature of Rebound I – „the effect of dematerialisation occurring subsequently to the immaterialisation switch”. However, Simmons believes that immaterialisation causes the neoclassical paradigm of homo economicus especially for the error of treating consumption behavior based on direct functional and cost preferences, not as a matter of lifestyle. For him, „The choice to opt for immaterialisation is about lifestyle: political issues as upbringing of children; quality of life (as opposed to the standard of living); and place in society weigh more heavily than cost issues. May Immaterialisation produce a cost saving; May it or not. It is the pattern of consumption Changed That is, not necessarily or systematically ITS cost, cloud (except very indirectly) ITS function”; neither in investment the rational behavior is not entirely privileged, intersecting with sociology, statistics and psychology (Mionel 2012). Obviously, Simmons (2002) can be found here with sociological theories of habitus (Pierre Bourdieu) and symbolic / emotional consumerism (Jean Baudrillard, Gilles Lipovetsky).

Similarly, Jurik and Vogel (2005) argue that the term of immaterialisation is designed to minimize the use of resources in the current lifestyles. However, this means a) drastic changes in consumer behavior and b) requires the development of new methodological models: a) Jurik and Voegel find immaterialisation perfectly plausible when it substitutes consumption of material goods with consumption of intangible goods. For them, the main advantage of immaterialisation is that the demand for intangible assets can grow almost indefinitely without becoming dissipative (even though it involves a material basis, just like a concert hall with acoustics and orchestra instruments that are required to use a classical concert and can be used multiple times in a row), while the demand for material goods may decrease, see experiment that tests consumers' immaterial choices of 20-25% households in Vienna: consumption of mineral water in non-returnable bottles versus a specific sport, Nordic walking, and / or shiatsu, exercises of alternative medicine: from 100 euros spent on non-returnable bottles, Nordic walking and / or shiatsu decrease to 30 kg waste for the same amount; b) Jurik and Voegel argue that the introduction of a time budget per consumer (ie duration of a service divided into functional units one person hour of utilized service type) solves the difficulty of measuring such recreational activities, ie service performance = number of Consumers x applied time budget. Innovation is applied by comparing the consumption of beer in the restaurant and theater visits (2003-2004). Without going into details, their results were correlated with materials related production bases and showed that “spending time by drinking beer is a better choice for resource conservation than going to the theater”.

Conclusion

Dematerialisation includes immaterialisation or virtualisation in production, while the immaterialisation involves immaterialisation of consumption and / or consumption behavior. Dematerialisation makes from gains in eco-efficiency and rebound effects (Rebound Effects D) a substitution effect (price substitution effect), ie the quantity of products and services with intangible content grows in the economy highlighting the increasement in consumption of energy and raw materials involved in the production of IST specific products and services, while immaterialisation emphasizes rather the choices of consumption or lifestyle and appears as a „switch in consumption behavior from more material to less material”; Rebound Effects I are in this case an effect of income (income effect), not a substitution one: Immaterialisation indicates that overlapping dematerialisation of economies with a too little immaterial lifestyle reduces eco-efficiency gains through increased consumption of goods and services with high material content. Thus, lifestyle and consumption patterns are in the heart of immaterialisation understood as „switch in consumption behavior from more material to less material”. In essence, entrepreneurship will have to face challenges related to the use of technology; creative products with high informational support to meet the creative, dynamic and fluctuating needs of consumers, ie smart economy will aim at maximizing lifestyle.

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References

- Bălăceanu, C., Apostol, D. M., and Penu D. (2012). The Information Society and its Eco-dis/advantages. *'Ovidius' University Annals, Economic Science Series*, Vol. XII, Issue 2/2012
- Chichilnisky, G. (2001). The Global Environment in the Knowledge Revolution. *Conference - Managing Human-Dominated Ecosystems*, March 27-29,
<http://www.chichilnisky.com/pdfs/papers/177.pdf>
- Chichilnisky, G. (2006). Global Property Rights. The Kyoto Protocol and the Knowledge Revolution. *Changement Climatique*, No. 08,
http://www.iddri.com/Publications/Collections/Idees-pour-le-debat/id_132006_graciela_kyotokr.pdf
- Daly, H. (2008). A steady-state economy. *Sustainable Development Commission UK*, April 24,
http://steadystaterevolution.org/files/pdf/Daly_UK_Paper.pdf
- Dasgupta, P. (2008). Nature in Economics. *Environmental Resource Economics*, 39,
<http://qed.econ.queensu.ca/pub/faculty/garvie/eer/Dasgupta%202008%20Nature%20in%20Economics.pdf>
- Dietz, S. and Neumayer, E. (2006). Weak and Strong Sustainability in the SEEA: Concepts and Measurement. *Ecological Economics*, 61 (4),
[http://eprints.lse.ac.uk/3058/1/Weak_and_strong_sustainability_in_the_SEEA_\(LSERO\).pdf](http://eprints.lse.ac.uk/3058/1/Weak_and_strong_sustainability_in_the_SEEA_(LSERO).pdf)
- Gowdy, J. and Mesner, S. (1998). The Evolution of Georgescu-Roegen's Bioeconomics. *Review of Social Economy*, Vol.LVI, No.2,
<http://homepages.rpi.edu/~gowdyj/mypapers/RSE1998.pdf>
- Gutes, M. C. (1996). The concept of weak sustainability. *Ecological Economics*, 17
- Harris, J. (2003). Sustainability and Sustainable Development. *International Society for Ecological Economics*, <http://isecoeco.org/pdf/susdev.pdf>
- Hartwick, J. M. (1977). Intergenerational Equity and the Investment of Rents from Exhaustible Resources. *American Economic Review*, 67
- Haq, M. ul (1995). *Reflections of Human Development*. Oxford University Press
- Harding, R. and Wantchekon, L. (2010). The Political Economy of Human Development. *Human Development*, Research Paper 2010/29,
http://hdr.undp.org/en/reports/global/hdr2010/papers/HDRP_2010_29.pdf
- Holling, C. S. (1996). Surprise for Science, Resilience for Ecosystems, and Incentives for People. *Ecological Applications*, Vol. 6, No.3, Aug.
- Isăilă Narcisa, (2012), *The Technology in New Learning Environments*, International Journal of Academic Research in Accounting, Finance and Management Sciences, Volume 2, Special Issue 1, pp. 128-131, Published by Human Resource Management Academic Research Society, ISSN: 2225-8329

Juric, Kristian and Gerhard Voegel (2005), “Does Immaterialisation Satisfy the Sustainability Imperative?”, http://www.unet.univie.ac.at/~a9601374/oslo_pap.pdf

Mazur, A. (2010). Energy Consumption, Electricity, and Lifestyle in Industrial Nations. <http://cepa.maxwell.syr.edu/papers/107/Mazur-2010-07b.pdf>

Mayumi, K., Giampetro, M., and Gowdy J. (1998). Georgescu-Roegen/Daly versus Solow/Stiglitz Revisited. *Ecological Economics*, 27

Mionel, Oana (2012), “Investors Behaviour between Theory and Practice”, *International Journal of Academic Research in Accounting, Finance and Management Sciences* Volume 2, Special Issue 1, pp. 53-56, <http://www.hrmars.com/admin/pics/1007.pdf>

Neumayer, E. (2004). Sustainability and Well-being Indicators. *WIDER Research Paper* No.23, http://eprints.lse.ac.uk/30851/1/_Libfile_repository_Content_Neumayer%2C%20E_Sustainability%20and%20well-being%20indicators_Sustainability%20and%20well-being%20indicators%20%28LSE%20RO%29.pdf

Neumayer, E. (2010). Humand Development and Sustainability. *Human Development*, Research Paper 05, http://hdr.undp.org/en/reports/global/hdr2010/papers/HDRP_2010_05.pdf

Percival, R. (1998). Environmental Legislation and the Problem of Collective Action. *DUKE ENVIRONMENTAL LAW & POLICY FORUM*, Fall Vol. 9:9,

M. F. Prada, S. Brata, D. F. Tudor, D. E. Popescu, Reducing of Gas Emissions according to the EU Energy Policy Targets, 209, *Environmental protection and sustainable development*, Vol. 14, No.1,

<https://docs.google.com/a/jepe-journal.info/viewer?a=v&pid=sites&srcid=amVwZS1qb3VybmFsLmluZm98amVwZS1qb3VybmFsGd4OmIxMzRmN2UxYjNhNzE4MQ>

Popoviciu G., Strategies for a Collaborative Eco-development, Vol. 13, No. 2

<https://docs.google.com/a/jepe-journal.info/viewer?a=v&pid=sites&srcid=amVwZS1qb3VybmFsLmluZm98amVwZS1qb3VybmFsGd4OjcwOGI2YjBiNTEyYWM3Yzc>

Prigogine, I. (2003). *Is Future Given? Changes in Our Description of Nature*. World Scientific Publishing Co. Pte.Ltd,

<http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1182&context=delpf>

R. Radoslav, A.M. Branea, B. Demetrescu, Resolving Ecological Problems through a Holistic Vision of Regional Urban Planning, 2249, Vol. 13, No.4

<https://docs.google.com/a/jepe-journal.info/viewer?a=v&pid=sites&srcid=amVwZS1qb3VybmFsLmluZm98amVwZS1qb3VybmFsGd4Ojc4OTFhMmZlNDBmYzcxMmY>

Rădulescu Violeta, Iuliana Cetina, Rădulescu Dragoș Marian, and Nora Mihail (2009), “The Fundamental Right For Environment The Premise Of The Ecological Marketing”, *METALURGIA INTERNATIONAL Vol.XIV, No.1 Special Issue*

Sen, A. (1987). Food and Freedom. D.C. October 29

<http://library.cgiar.org/bitstream/handle/10947/556/craw3.pdf?sequence=1>

Schnaiberg, A., Pellow, D., and Weinberg A. (2000). The Treadmill of production of Environmental State. Chicago, Illionois, April 4,

http://www.ipr.northwestern.edu/publications/workingpapers/2004/schnaiberg/17_TreadmillEnvirState.pdf

Toman, M. A., Lile, R., and King D. (1998). Assessing Sustainability: Some Conceptual and Empirical Challenges. *Resources for the Future Discussion*, Paper 98-42, July, <http://www.rff.org/rff/Documents/RFF-DP-98-42.pdf>

Willard, T. and Halder, M. (2003). The Information Society and Sustainable Development. *IISD*, http://www.iisd.org/pdf/2003/networks_sd_exploring_linkages.pdf