

THE EFFECTS OF CREATIVE DESTRUCTION AND INNOVATION ON INEQUALITY

Julia Dobрева

Department of Finance, VUZF University, Sofia, Bulgaria

Abstract

The influence of creative destruction on business activity and economic development is enormous. In the era of speedy innovations and technological progress it contributes to the overall process of transformation of economic activities. Meanwhile, creative destruction challenges also the social dimension by destroying obsolete jobs and creating new ones. The major challenge for countries with low levels of innovation is to manage to implement the requisites of creative destruction and increase the levels of innovation while at the same time balance the income levels in specific regions. This can be done through developing mechanisms for increasing skills and the acquisition of new competencies among the local population. Regional development plans need to envisage the implementation of innovations in parallel to the education of the human resource. This paper discusses the main factors, contributing to inequality as a result of creative destruction and explains the importance of increasing education, skills and qualification levels.

Keywords: *inequality; creative destruction; innovations; unemployment*

1. INTRODUCTION

In numerous research publications the impact of creative destruction on business activity and economic development has been considered as enormous. Speedy innovations and technological progress contribute to strengthening the overall process of transformation of economic activities. Meanwhile, creative destruction challenges also the social dimension by destroying obsolete jobs and creating new ones. The major challenge for countries with low levels of innovation is to manage to implement the requisites of creative destruction and increase the levels of innovation while at the same time balance the income levels in specific regions. It is both a challenge for developed and developing countries, as there is a general slowdown in R&D leading to slower growth levels and this requires a more intensive approach to innovation.

Creative destruction can increase the potential for innovation and reduce inequality of income among the population, thus increasing the standard of living. This can be done through developing mechanisms for increasing skills and the acquisition of new competencies. Regional development plans of less developed countries in Africa, Asia and those of the developed OECD countries need to envisage the implementation of innovations in parallel to the education of the human resource in order to overcome impediments to growth.

This paper discusses the main factors, contributing to inequality as a result of creative destruction and explains the importance of increasing education, skills and qualification levels. It explains how job creation is achieved through creative destruction and what is the supreme role of innovations as an element of creative destruction to improve the prospects of job creation, increase growth and alleviate poverty and inequality.

2. JOB CREATION THROUGH CREATIVE DESTRUCTION

Carabello (2008) claims that the most often used empirical proxies for the intensity of the process of creative destruction are those of factor reallocation and mainly job flows. Also, according to a study done by Davis, Haltiwanger and Schuh (1996) job creation (destruction) can be defined as the positive (negative) net employment change at the establishment level from one period to the next. In essence, over 10% of the jobs that exist at any point in time did not exist a year before or will not exist a year later. This makes it very challenging both for employers and education authorities to make a permanent

and long-lasting policy to sustain the on-the-job training and education programs for acquiring proper qualification levels. Respectively, such swift changes in the job requirements as a result of creative destruction and introduction of new technology leads to increase in the income disparities and rising inequality levels. What is more, it is not just a spontaneous and occasional event but a persistent process of a large scale, which occurs within and not across narrowly defined economic sectors. Hence, technological change leads to job destruction and simultaneous creation of new jobs, thus contributing to economic changes within certain sectors and ultimate economic growth. Nevertheless, inequality arises during the first phase of this transformation and continues until new developments are introduced in the reformed business activity.

Economic activity changes significantly during recessions and this is also the economic cycle which is mainly connected to job destruction and subsequent job creation with recovery of economic activity. As Carabello (2008) properly notes, once one considers a heterogeneous productive structure that experiences ongoing creative destruction, the cumulative effect of a recession on overall restructuring may be positive, zero, or even negative, depending not only on how the economy contracts but also on how it recovers. This explains why the relation between recessions and economic restructuring requires the examination of the effect of a recession on aggregate separations not only at impact, but also cumulatively throughout the whole recession-recovery episode. Carabello (2008) explored this issue using quarterly US manufacturing gross job flows and employment data for the 1972–93 period, and found that, along the recovery path, job destruction declines and falls below average for a significant amount of time, more than offsetting its initial peak. On the contrary, the analysis estimated that job creation recovers, but it does not exceed its average level by any significant extent to offset its initial decline. This evidence indicates that, on average, recessions depress restructuring of the economy and as the process of job destruction is longer and takes more time and effort for the economy to adapt and reconstruct, this time-span until the recovery peak is characterized by and increase in income disparities and inequality.

Furthermore Caballero et al. (2004) found that job security provisions which are measured by variables such as grounds for dismissal protection, protection regarding dismissal procedures, notice and severance payments, and protection of employment in the constitution - all these hamper the creative destruction process. They estimated that this occurs especially in countries where regulations are likely to be enforced. Their observations point to the fact that by impairing worker movements from less to more productive units, effective labour protection reduces aggregate output and eventually slows down economic growth. As a result, they estimated that moving from the 20th to the 80th percentile of job security lowers annual productivity growth by 1.7 %, which is a direct economic effect that respectively has an impact on income levels.

Furthermore, a study by Michau (2013) arrives at the conclusion that a 1% increase in growth raises the unemployment rate by 1.72 percentage points in the economy without on-the-job search and by only 0.07 percentage points with on-the-job search. These observations lead to the conclusion that rather than contributing to unemployment through more frequent job separations, creative destruction induces a direct reallocation of workers from low to high productivity jobs. Therefore, this aspect brings positive change to the workers profile and his/her income level and hence contributes to reduction of inequality in the particular income group of the sector. In another study Prat (2007) uncovers a new effect whereby an increase in growth intensifies the endogenous rate of job separation because it raises the workers' outside option. The study concludes that the *outside option effect* outweighs the *capitalization effect*, so that disembodied technological progress increases the rate of unemployment.

Yet, the introduction of new technology, which spurs the process of creative destruction, while being embodied in capital equipment can be adopted either through destruction of existing jobs and the creation of new ones or by renovation, updating the job's equipment (Mortensen & Pissarides, 1998). Under the assumption that the destruction of jobs generates worker layoffs, they show that higher productivity growth induces lower unemployment when renovation costs are low. However, they notice also that the response of employment to growth switches from positive to negative as the cost of updating existing technology rises above a unique critical level. In another study Miyamoto and Takahashi (2011) observe that faster growth reduces unemployment by decreasing job separation and inducing job

creation. Their study highlights that incorporation of on-the-job search substantially improves the ability of the Mortensen and Pissarides model to explain the effect of growth on labor market variables. Also, it has to be underlined that the very nature of work, due to technical change, affects the rate of job destruction, and hence the level of unemployment. In their study Career and Drouot (2004) argue that technological progress modifies on-the-job learning as well as unemployment and wage dispersion. In the context of the canonical Mortensen and Pissarides model, they demonstrate that, in a routine world, this “on-the-job learning effect” can offset the creative destruction effect induced by an increase in the pace of technological change on unemployment. Also, it can amplify it as jobs become less routine.

3. INNOVATION AND CREATIVE DESTRUCTION

Using data from the US Longitudinal Business Database on all conform private businesses from 1983 to 2013, Masia, Hsieh, and Klenow (2019) arrive at three main conclusions: first they claim that most growth appears to come from incumbents and this inference comes from the modest employment share of entering firms (defined as those less than 5 years old). Secondly, they claim that most growth seems to occur through improvements of existing varieties rather than creation of brand-new varieties. Finally, own product improvements by incumbents appear to be more important than creative destruction.

It is mainly through innovation that creative destruction can be fulfilled and subsequently lead to job creation. In their study Ciriaci, Castello and Voigt (2013) find that employment creation is persistent over time in the case of innovative firms and it is not in the case of non-innovative firms. Moreover, their study indicates that among those firms experiencing high organic employment growth, smaller and younger innovative firms grow more on average than larger innovative firms. Also, among declining firms, non-innovators tend to deteriorate faster in terms of economic performance, while larger and older firms have a bigger buffer in times of declining growth. In essence, the main focus of the study is that it compares the employment growth patterns of innovative and non-innovative firms focusing on whether there are systematic differences in the persistence of the jobs created. The authors use data from a unique longitudinal dataset of 3,300 Spanish firms over the years 2002-2009. The evidence suggests that being innovative supports and stabilizes a company's employment growth pattern and being smaller and younger seems to be a sufficient condition to experience high employment growth. Therefore, it is not necessary to have a comparably high R&D spending / being an R&D intensive company.

The main contribution of innovation, in this sense, lies in the decrease in inequality through job creation and growth. While innovation occurs more speedily in small and medium companies, it is through their establishment (as a process of creative destruction) that new jobs can be created through which income can be generated. In his study Santoleri (2020) examines the innovation-employment nexus for startups using the Kauffman Firm Survey, a unique longitudinal dataset tracking a single cohort of US firms founded in 2004. The results of the study based on fixed effects panel quantile regressions indicate an overall positive and at the same time heterogeneous effect of innovation activities on the conditional employment growth distribution. Furthermore, the findings reveal that both R&D, as well as patents have a positive association with employment growth especially for those new firms experiencing high growth.

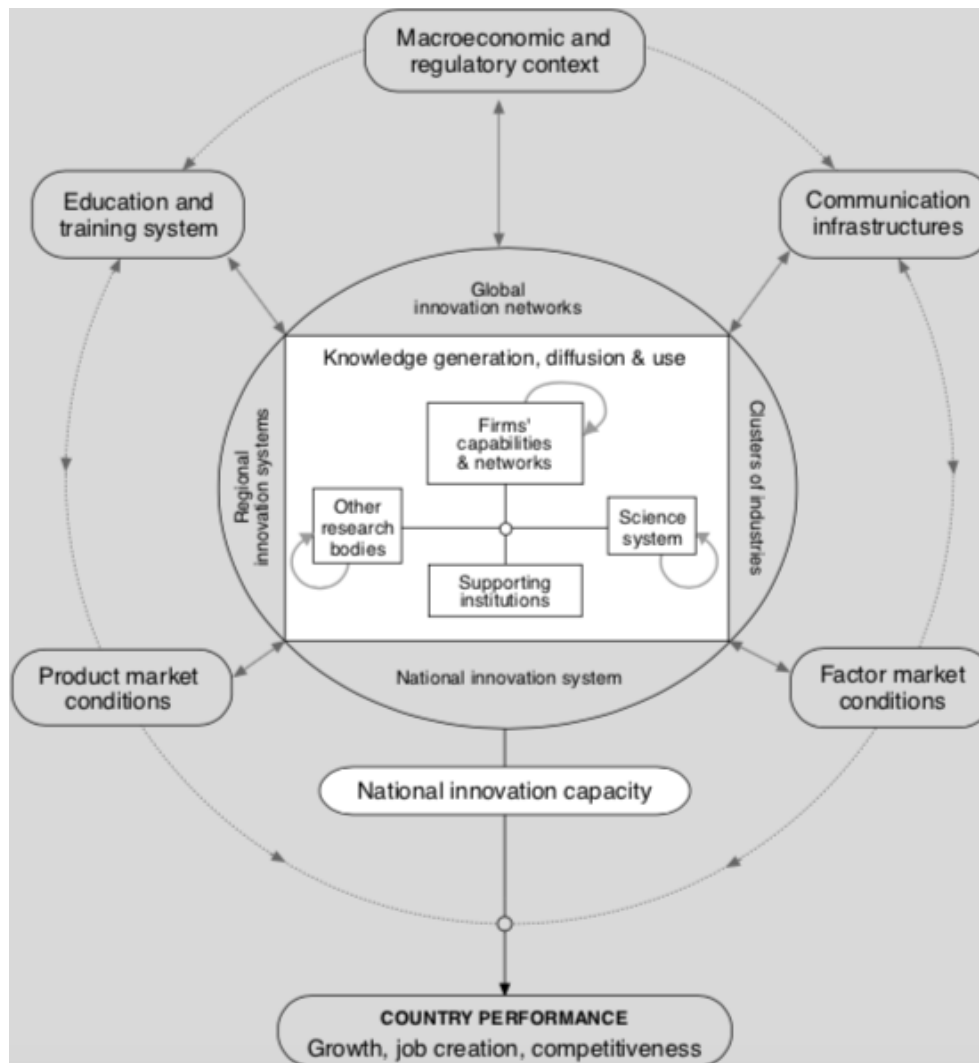


Fig. 1. Actors and linkages in the innovation system

Source: OECD Secretariat (OECD Job Strategy)

In the context of regional impact of innovation on growth and job creation Okumu, Bbaale and Guloba estimate the association between innovation and employment growth among manufacturing firms in Africa. Their survey is done by using a cross-sectional World Bank Enterprise Survey dataset in which innovation is categorized as product innovation and process innovation. The results indicate that: (1) employment growth is positively associated with both process and product innovation, (2) a weak business environment especially intermittent electricity supply undermines the ability of innovation to induce employment growth and (3) relationship between innovation and employment growth is not conditioned on firm age although it is conditioned on firm size. Furthermore, the findings suggest that employment growth in Africa could benefit from policies and programs that induce firms to embrace innovation. In addition, the authors claim that a strong business environment is necessary in complementing the potential of innovation to enhance employment growth in Africa.

When considering the more developed region of OECD, the OECD jobs strategy presumes that change drives long-term economic growth, productivity and improvement in living standards. Also, the emergence and diffusion of new ideas, products and production techniques throughout the economy entails a process of “creative destruction”. New technologies destroy jobs in some industries, especially among the low-skilled, while creating jobs which are often in different industries and require different skills. Historically, this process has led to net job creation, as new industries replace old ones and

workers adapt their skills to changing and expanding demand. Today's rapid technological change coupled with the extensive restructuring underway in OECD economies leads some to associate technology with unemployment and social distress. However, technology per se is not the culprit. Its economy-wide employment impact is likely to be positive provided that the mechanisms for translating technology into jobs are not impaired by deficiencies in training and innovation systems and rigidities in product, labour and financial markets. To realise the full potential of technological change in improving economy-wide productivity, growth and job creation, governments need to make innovation and technology diffusion policies an integral part of overall economic policy (see Fig. 1).

It is more and more evident that economic activity is becoming increasingly knowledge-based and therefore jobs are shifting from low-skilled to high-skilled forms. In the same manner employment growth and productivity depend on proper conditions for diffusion of new products and processes within an economy. Even though it is the group of most developed countries, in many of them aggregate productivity and employment growth remain modest. The companies that successfully combine organisational change, technological change, and upskilling display strong economic performance. The OECD report (OECD Job Strategy) defines several main priority areas to improve job creation, productivity, as well as to decrease inequality by increasing living standards:

1. Long-term growth rates in OECD economies depend on maintaining and expanding the knowledge base. At the same time it makes it more responsive to economic and social needs. The importance of this area is significant given the decline in government funding for research, and the shift of private sector efforts away from basic research and towards more short-term innovative efforts.
2. The reforms to achieve long-term technological opportunities include several measures and mechanisms, namely: adequately financing public research institutions, raising their flexibility; strengthening incentives for university-industry in research.
3. Productivity growth depends on company's innovative efforts. All OECD governments have policies in place for the support of industrial R&D. Efficiency gains could be obtained by reducing the generosity of R&D tax incentives. Meanwhile, governments should remove impediments to the development of market mechanisms for financing innovation, such as private venture capital, to complement the traditional financial R&D support. Such policies can also be enhanced through the use of public/private partnerships.
4. Productivity and employment gains in the whole economy are generated when new technologies are diffused and widely adopted. Strengthening technology diffusion mechanisms should become a key policy priority. This can be initiated through open trade, regulatory reform and enhanced competition, while innovation must be in various areas not only telecommunications, but also in more mature sectors.
5. Complementarity between education, technology and training policies is important for solving the difficult matching between demand and supply for skills. It is moreover important for improving employment performance. This requires the introduction of measures to reinforce, expand and broaden the content of vocational and technical training in a many countries as well as enhancing mobility of highly skilled and technically trained workers.
6. The improvement in the conditions for the creation and growth of new technology-based firms increases their direct job-creating potential. It also indirectly increases growth and job creation throughout the economy through lower prices, higher productivity, and product variety.
7. Internet-based services and environmental goods and services as new industries are important for translating technical change into productivity and employment.
8. The improvements in institutional mechanisms for the evaluation of policies will increase their efficiency. Yet in most countries there is a recognised need for the development of better methodological tools and also improved institutional mechanisms to introduce evaluations in the very process of policy making.

4. DISCUSSION

In this paper we outlined certain important correlations between economic growth, innovations, job creation and reduction of inequality:

Firstly, it is important to highlight that economic activity changes significantly during recessions and this is also the economic cycle which is mainly connected to job destruction and subsequent job creation with recovery of economic activity. Evidence suggests that recessions slow down the restructuring of the economy and the time-required to reach the recovery peak is characterised by an increase in income disparities and inequality. Hence, normally inequality rises with recessions and is reduced during periods of economic recovery and growth.

On the other hand, creative destruction is an element of growth and it induces a direct reallocation of workers from low to high productivity jobs. This process improves the workers profile and as a result his/her income level increases, thus it contributes to reduction of inequality in the particular income group. The main contribution of innovation as a distinctive element of creative destruction lies in the decrease in inequality through job creation and growth. What is more, innovation occurs more speedily in small and medium companies within which that new jobs can be created and increase in income can be generated, thus reducing inequality.

In less developed countries strong business environment is necessary to increase the potential of innovation, enhance employment growth, and reduce inequality. In the developed OECD countries, creative destruction drives long-term economic growth, productivity and improvement in living standards. New technologies destroy jobs in some industries, especially among the low-skilled, while creating jobs which are often in different industries and require different, high skills increasing income levels`.

Finally, economic activity is becoming increasingly knowledge-based both in developed and developing countries and therefore jobs are shifting from low-skilled to high-skilled forms. Employment growth and productivity depend on proper conditions for diffusion of new products and processes within an economy.

5. CONCLUSION

Inequality is widening even though in many countries economic growth and poverty reduction have been achieved in the last decades. Many different mechanisms have been employed in the search for the most appropriate approach for reducing inequality and alleviating poverty. The most effective, however, is the proper introduction of innovations in the technological process through creative destruction and also the improvement of skilled labour through proper government mechanisms.

Creative destruction has proven to be efficient in job creation, even though it is genuinely related to job destruction on the first place. Changes in the job requirements as a result of creative destruction and introduction of new technology lead to increase in the income disparities and rising inequality levels. It is not just a spontaneous and occasional event but a persistent process of a large scale, which occurs within and not across economic sectors. Therefore, an important conclusion is that technological change leads job destruction and simultaneous creation thus contributing to economic changes within certain sectors and ultimate economic growth. Inequality arises during the first phase of this transformation and continues until new developments are introduced in the reformed business activity.

It is mainly through innovation that creative destruction can be fulfilled and subsequently lead to job creation. The main contribution of innovation, in this sense, lies in the decrease in inequality through job creation and growth. While innovation occurs in a large scope in small and medium companies, it is through their establishment as a process of creative destruction that new jobs can be created through which income can be generated.

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