



MONTHLY REVIEW OF ACADEMIC LITERATURE ON RESEARCH AND INNOVATION AS SOURCES OF GROWTH

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1. Neoliberalism: Oversold?

Ostry, J. D., Loungani, P. & Furceri, D. (2016). Neoliberalism: Oversold?. *Finance & Development* (June): 38-41.

- The paper assesses the economic impact of two pillars of the neoliberal agenda: increased competition and smaller size of the State.
- Increased competition through deregulation and the opening up of domestic markets to foreign investors is associated, the paper says, with higher inequality and crisis probability.
- Reducing the size of the state as *one size fits all* measure is associated with increased inequality and unemployment and does not necessarily deliver higher growth.
- Foreign direct investment (FDI) as driver of technology diffusion and ample fiscal space to governments are suggested as growth-enhancing inequality-reducing policies.

Following the Chilean economic miracle in the Seventies, policies of the neoliberal agenda started to diffuse worldwide. They rely on two main pillars which are supposed to deliver long term economic growth. First increasing competition by opening domestic markets to foreign investors by removing controls to capital movements across countries. Secondly, reducing the role of the state in the economy through privatisation and limiting governments ability to run fiscal deficits and debt. Reported evidence suggests that the benefits in terms of higher growth are difficult to establish across countries, while a trade-off between growth and inequality has arised, eventually damaging growth capacity itself. Opening up markets to capital inflows has opened the way to portfolio and banking flows which affect the recipient country by increasing inequality and crisis probability. Full capital flow liberalisation is recognized by the IMF as a not always appropriate goal. Only FDI are found to be a driver of technology and human capital transfers, which are positive boosters of long term growth. Similarly, the austerity package and the reduction of government sizes should be seen on a country-specific basis, possibly implemented as countercyclical policies. Short term fiscal consolidation provokes economy contraction and higher inequality.

2. Jobs and Competitiveness in a Polarised Europe

Cirillo, V. & Guarascio, D. (2016). Jobs and competitiveness in a polarised Europe. *Intereconomics*, 50(3), 156-160.

- The paper reports evidence of the polarisation of economic activities and skills composition of the labour force in Europe in the aftermath of the last economic crisis.
- Europe has been polarising in a German-centred core which maintained employment, including for the skilled labour force, and a Southern periphery which did not.
- This pattern is associated with a polarisation in economic structure, capable to increase the share of industrial activities, while the South has undertaken a deindustrialisation process.
- These trends led to downgrading of human capital and of the whole occupation structure.
- A knowledge-based industrial policy is needed to raise EU competitive capacity and its potential for knowledge and innovation diffusion.

The authors assess the evidence concerning employment and production dynamics in the EU in the aftermath of the crisis. Employment and economic activity trends show that the EU has polarised in recent years and that the convergence objective is far from being achieved. In particular, in addition to the Nordic countries, it is possible to distinguish two main groups of countries: a German-centred core (Germany, Austria, Poland, Czech Republic, Slovakia and Hungary) and a Southern Periphery (Italy, Spain, France, Greece and Portugal). Employment in the first group has expanded beyond the pre-crisis levels, while unemployment is on the rise in the Southern periphery. In addition, job losses in the South have been large in the high skilled part of the employment distribution, implying a downgrade of the occupational structure. This process is associated with an ongoing deindustrialisation of the South. Indeed manufacturing sectors, characterised by technology intensive activities and high skilled labour force, are reducing their share in the Southern countries' economic structure which is becoming progressively more services based, differently from the trend in countries like Germany, China and South Korea. These trends contribute to make the EU more unequal and hinder its capacity to produce knowledge and diffuse innovation, making it more vulnerable to Asian exports. A knowledge-based industrial policy is needed to raise EU competitive capacity, away from a labour-costs competitiveness strategy which is prevailing in the Southern periphery.

3. Flexible labor and innovation in the Italian industrial sector

Franceschi, F. & Mariani, V. (2015). Flexible labor and innovation in the Italian industrial sector. *Industrial and Corporate Change*: 1-16.

- The correlation between labour flexibility and innovation in Italy is found to be negative: as firm internal flexibility increases, innovation outputs decline.
- The authors suggest that the Italian labour market reforms of the last decade have their role to play in the weak innovation outcomes of firms and ultimately growth performance.
- These labour market reforms were designed to decrease worker protection and reduce the cost of temporary work contracts.

By making use of new patent application data from the Bank of Italy, this research analyses the relationship between within firm flexibility of labour and innovation outcomes. The empirical investigation focuses on numerical flexibility, i.e. how a firm adjusts its workforce if demand shocks occur. The degree of labour flexibility is proxied by the share of workers who are employed on the basis of a temporary contract. Although labour market reforms to increase flexibility and the deepening of a dual labour market with protected insiders on one side and outsiders with temporary contracts on the other were pursued in many European countries since the 90s, the Italian reforms particularly affect the young generation. These early reforms mainly targeted temporary jobs which were held by about a third of workers in the age group of 15-34. After controlling for issues of endogeneity, the result of a negative relationship between numerical labour flexibility and innovation activity is robust to the introduction of various model specifications. The increase in flexibility is found to reduce innovation activity further, even though it is already at socially inefficient levels.

4. The Innovation-Employment Nexus: A Critical survey of Theory and Empirics

Calvino, F. & Virgillito, M. E. (2016). The Innovation-Employment Nexus: A Critical Survey of Theory and Empirics. *ISIGrowth Working Paper 9/2016 March*.

- The majority of recent firm-level studies on high-growth, high-tech companies show a positive correlation between innovation and employment growth.
- The type of innovation, whether related to product or process, has a specific impact on the employment dynamics of an enterprise.
- Although heterogeneity in employment effects exists, the evidence points towards a positive link between innovation and employment when focusing on sectoral specificities.

This review paper studies the impact of technological change on employment at various levels of aggregation, i.e. taking into account differences at the firm- and sector-level. After an explanation of the theoretical adjustment mechanism of labour to technological innovation, the empirical evidence is presented along with methodological issues with a focus on the most recent developments in the field. The essay goes on to present some stylised facts on the innovation-employment nexus and concludes with an outlook on the most pressing gaps in the literature. Innovation is recognised as being an intrinsically complex phenomenon and the use of a variety of indicators in the literature leads to heterogeneous empirical results. The use of innovation survey data has limitations as has matching register data with other micro-level information. The former are however more prone to measurement error as they stem from self-reported records. Another challenge is related to adequately capturing selection and learning effects related to linking the firm- with the industry-level. After reviewing the literature in depth, the authors also noticed that the exact components of product and process innovation are rarely analysed in detail. These can have differing effects on job creation; the introduction of a novel delivery system, for example, can lead to an increase in demand for workers despite being a process innovation. And the direction of effects related to the specific case of the introduction of new software and information systems are not yet empirically established either. Overall the authors conclude that the scope for further empirical analysis related to the employment-innovation-nexus remains vast.

5. The greener the better? Job creation effects of environmentally-friendly technological change

Gagliardi, L., Marin, G. & Miriello, C. (2016). The Greener the better? Job creation effects of environmentally-friendly technological change. *Industrial and Corporate Change*: 1-29.

- A strong positive effect of eco-innovation on long-term job creation is found for Italian manufacturing firms between 2001 and 2008.
- The impact of green innovation on employment is more pronounced than for other forms of innovation.

This empirical research paper studies green innovation and its job creation potential in manufacturing firms in Italy. The policy induced transition towards cleaner forms of production and consumption and the related innovations generated significant employment growth between 2001 and 2008. As green innovation is likely to be linked to the introduction of new technologies, in areas where the stock of fixed capital is still relatively modest compared to more traditional industries, the employment effects are positive in the short and medium term due to the necessity to still perform many routine tasks by the workforce. Investing in green technologies is believed to contribute to job creation through the channel of new market opportunities. Environmental-related technological change and the formation of new industries may even lead to higher and excellent growth rates.

6. Innovation and Employment in Patenting Firms: Empirical Evidence from Europe

Van Roy, V., Vertesy, D. & Vivarelli, M. (2016). Innovation and Employment in Patenting Firms; Empirical Evidence from Europe. IZA DP No. 9147.

- Making use of European panel microdata, this empirical research paper investigates the jobs-generating nature of innovation at the firm level.
- According to sectoral estimates, only high- and medium tech manufacturers can translate innovation into increased job creation.
- Conversely, for low-tech manufacturing firms and firms in the service sector no positive employment effects can be established.

The authors investigate the relationship between innovation activity and employment in 22 European countries over the period 2003-2012. Innovation is measured in a novel quality oriented way, by using citation-weighted patents, reflecting the technological importance of patents for the development of cutting edge technologies. It is not clear a priori whether a positive labour demand effects will show across countries as previous studies typically focused on a single country.

Separate estimates for manufacturing versus services and high-tech versus low-tech manufacturing sectors are presented to shed light on the specificities of the transmission channels of innovation activity. The results indicate a clear capacity for job creation of manufacturers in new and emerging sectors with greater technological opportunities as well as a higher elasticity of demand. The creation of new goods leading to job creation, the so-called 'welfare effect', appears to override the 'substitution effect' where mature products are displaced by new ones. With regard to policy implications, the authors warn that labour-saving effects of non-patented process innovations are possibly not captured by the study. Hence it is suggested to enrich the available indicators on innovation activity, also paying attention to the inclusion of service innovations, so as to arrive at more robust estimates. Furthermore, it should be noted that this empirical investigation limits itself to a sample of medium to large patent-intensive firms, hence results cannot be generalised. Nevertheless, the Europe 2020 strategy with its focus on innovation and a knowledge-based economy should be pursued further so as to fuel the prospects of innovation-led growth and job creation.

7. Taking the Leap: The Determinants of Entrepreneurs Hiring their First Employee

Fairlie, R. W. & Miranda, J. (2016). *Taking the Leap: The Determinants of Entrepreneurs Hiring their First Employee*. IZA DP No. 9848.

- Intellectual property, including patents, copyrights and trademarks, is significantly related to becoming a start-up enterprise hiring employees.
- Jointly analysing three US data sets, this paper finds a seven percentage point increase in the annual likelihood of creating the first posts when start-ups hold intellectual property.
- Other determinants of making the transition from non-employer to employer such as entrepreneurship training and the founder's education are found to be of no importance.

In order to study the drivers of job creation in the US, this paper examines the transition path of start-up enterprises from non-employer to becoming an employer. Although regulatory barriers appear daunting at first, such as additional registration and legal requirement related to health and unemployment insurance, these issues are cast aside in favour of analysing the dynamics of job creation after the first years of establishment. It is enquired whether the demographic and human capital characteristics of entrepreneurs are a determinant for hiring and how training can be supportive in making the transition to employer. Lastly, the authors investigate the impact of business conditions, as for instance owning patents, on making the step to becoming an employer. This study is unique because it combines three data sources, firstly the U.S. Census Bureau's Integrated Longitudinal Business Database (ILBD), secondly the Kauffman Firm Survey (KFS) and thirdly the Growing America through Entrepreneurship (GATE) experiment. The first provides a panel of micro data of non-employers matched to employers, whereas the second contains data on growth-oriented start-ups, owner and business characteristics. The last dataset stems from a random experiment on the effects of entrepreneurship training. The data sources are combined to determine whether and when a start-up founder creates jobs. Apart from the above mentioned results, the study also finds that there does not exist a clear and strong relationship between revenues and creating the first job(s). Apart from ownership of intellectual property, only gender and ethnicity are shown to be determinants of hiring behaviour. Men, Asians and Hispanics have a higher probability of becoming entrepreneurs as opposed to women, Whites and African-Americans.

8. Economic growth, human capital and structural change

Teixeira, A. A. C. & Queiros, A. S. S. (2016). *Economic growth, human capital and structural change*. *Research Policy* 45: 1636-1648.

- The paper empirically investigates the impact of human capital and structural change on economic growth for two sets of countries: OECD and OECD + Mediterranean and Transitional countries.
- Results show that human capital and structural change have a positive impact on economic growth.
- However the impact of human capital is lowered when less developed economies are considered, since those countries have a lower share of high tech industries.

The study aims to integrate demand and supply side factors in an empirical growth model to estimate the impact of economic and political factors on economic growth for two different samples of countries. In particular, the focus is on human capital, structural change (the share of high tech industries in the economy) and their interaction, while controlling for public expenditure, population growth, political liberties and civil rights. Results support the hypothesis that countries with a higher stock of human capital grow faster than others. Also, the positive relationship between GDP growth and high tech industries is confirmed. However, when the interaction between the two variables is considered, a negative estimate is obtained when including Mediterranean and Transitional economies. This suggests that the potential of human capital is hampered in countries in which the share of high tech activities is low or declining, as for European eastern economies which are characterised by a lower share of high tech manufacturing activities. The authors also find a negative impact of public consumption and population growth, while the role of political liberties is ambiguous, since the first sample includes "non democratic" regimes which experienced positive economic growth.

9. Additionality or crowding-out? An overall evaluation of public R&D subsidy on private R&D expenditure

Marino, M., Luhuillery, S., Parrotta & P., Sala, D. (2016). *Additionality or crowding-out? An overall evaluation of public R&D subsidy on private R&D expenditure. In press*

- The paper investigates the impact of public R&D subsidies on private R&D expenditure in a sample of French firms with more than 20 employees.
- The effect of public subsidies is evaluated accounting for the size of the subsidy and distinguishing between firms who do and do not benefit from R&D tax credits.
- When accounting for possible unobserved effects, results suggest that no additionality or crowding out are in place, especially for medium-high levels of public subsidies.
- Negative results are observed especially following the R&D tax credits reform in 2004.

The study investigates the impact of R&D subsidies on R&D expenditure of French firms from 1993 to 2009. The main contribution of the paper is that it aims to correct the bias in the estimates arising from unobservable factors which may affect the impact of R&D subsidies, by evaluating the impact of the R&D policy on the growth rate of private R&D investment, cleaning any time invariant fixed effects. In addition, the empirical framework distinguishes between firms which do and do not benefit from the French R&D tax credits scheme, allowing to disentangle the particular impact of R&D subsidies. Results suggest that R&D subsidies crowd out private investment, and this effect is particularly significant for medium and large amounts of the subsidy. In particular, medium-high support is less effective than smaller amounts, while only subsidies higher than EUR 10 million are found to positively affect private R&D spending. The negative impact of subsidies is significant after the French tax credit reform in 2004. It is worth noting that the sample used does not include manufacturing companies with less than 20 employees, which constitute a significant proportion of the firm population in France.