Growth and Unemployment: towards a theoretical integration

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ABSTRACT

The research about the topic of growth and unemployment took place in the first half of the 20th century thanks to Harrod's (1939) and Domar's (1947) seminal works. These early contributions for a dynamic theory of Economic growth were based on a modification of the set of core assumptions of Keynes' *General Theory*. Harrod and Domar assumed the productivity of the system to be varying over the time, in order to identify a relation between demand and supply dynamics. In this sense we can affirm that their Growth theory was developed as an extension of the *General Theory*, considering the presence of unemployment as one of the possible outcome generated by the mismatch of demand and supply.

At the very beginning growth and unemployment were intimately linked, but after 1956 the affirmation of Solow's paradigm led growth theorists to focus on models based on a balanced path of equilibria, with efficient allocation of the resources. Solow-Ramsey models became the first real universally recognized paradigm apt to investigation about Economic growth. In this way the absolute dominancy of the Neoclassical framework ruled out the problem of long-run unemployment until the beginning of the 1990's. Economic growth and Labour economics were considered so far apart in their field of research, dealing with different issues that were developed through different tools: equilibrium and exogenous technological change in the long-run and disequilibrium due to temporary shocks in the short-run.

Fact is that up until now empirical evidence has often reported that the persistence of unemployment as a long-run phenomenon represented and still represents an important issue, particularly for European countries, needing to find a convincing explanation and an opportune set of remedies.

At the very end of the '80s the revolution of Endogenous growth theory developed a new set of heterogeneous contributions. This represented the opportunity of re-considering the core assumptions lying at the base of growth models. It was in this set of brand new models that the

problem of growth and unemployment again found the reason for renewed interest. The integration amongst growth and unemployment was helped by the new tools developed in the field of Labour economics. Pissarides' (1990) theory of unemployment in equilibrium allowed to formalize the dynamics of flows into and out to unemployment, justifying the presence of both long-run and short-run unemployment. In a model of overlapping generations Bean and Pissarides (1994) developed further research exploring both Neoclassical and Keynesian features arising by the interplay of capital accumulation and the mechanism of job-search.

A Schumpeterian perspective about this topic was provided by Aghion and Howitt (1994) which was subsequently re-organized in their "Endogenous Growth Theory" in 1998. Aghion and Howitt considered the basic framework of job-search and suggested an opportune micro-foundation of the Beveridge curve. This procedure allows establishing a link between the necessity of innovating of the entrepreneur and the problem of matching a properly skilled worker with the new technology. The resulting model leads to consider different and competing effects, such as creative destruction and capitalization. Their composition can either increase or decrease unemployment as a final result.

In the second half of the 1990's other contributions considering the problem of unemployment in a growing economy have appeared in literature, but Bean and Pissarides' (1994) and Aghion and Howitt's (1994) works may still be considered the most complete frameworks that deal with the issue in a dynamic general equilibrium environment.

It really seems that this new field of research can provide a wider range of opportunities and this survey means to provide both a classification of the contributions that leaded to these first results and a general perspective for further studies about this topic.

We briefly highlight the main differences between the Neoclassical approach and the main features of Endogenous growth. Then we focus on a subset of models characterized by the presence of externalities. We identify some fundamental mechanisms leading to growth such as accumulation of human capital, presence of R&D sector and the interplay of reciprocal expectations amongst the agents. In this process we try to discover the effective or the potential capability of these mechanisms to generate unemployment during the process of growth. We show that while the first links between growth and unemployment were basically traced in models of R&D, the accumulation of human capital with heterogeneous workers, characterized by different level of skill, can represent another useful explanation of the mismatches generated on the labour market. In this sense we will analyse some of the features discussed by Lucas (1988, 1993), Stokey (1988, 1993) and Galor and Tsiddon (1997). After considering processes of growth based on flows (like cumulative learning) and stocks (based on R&D sectors) we analyse a sort of complementarity among these different sources of growth to consider the consequences that are generated on the dynamics of the labour demand. The main reference will be Young's (1993) model of invention and bounded learning by doing.

Finally, we consider the role played by reciprocal expectations among heterogeneous agents, developed in a stream of articles by Acemouglu (1994, 1996, 1997). In this last set of models the persistence of unemployment in a growing economy emerges as the outcome of a Nash equilibrium, where workers choose their level of skill and entrepreneurs choose whether to invest in R&D. This will lead us to re-interpret the concept of coordination failures in the sense of Cooper and John (1988) as a powerful tool able to explain the issue and to suggest policy intervention to obtain Pareto-improvements.

The presence of any degree of heterogeneity, externalities, complementarities among factors, among processes and among the strategies of heterogeneous agents will represent the basic features of an ideal model of growth and unemployment.

It will emerge that policies for employment that are directly oriented to the labour market can fail to register a sensitive effect in the long-run. Since the causes of unemployment can arise outside and very far away from the labour market, the policy maker could find it useful to consider the existing links between the technology choice, the level of education of workers and the role of expectations of the agents in general. In this sense, for more than one reason, it can be stated that growth and unemployment should really be considered as two different aspects of a unique phenomenon.