

## Determinants of Growth in Developed Countries: A Multiregional Perspective

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There is a certain consensus in economic literature about the factors that influence historical differences in growth rates observed between developed and developing countries. However, it is less clear what elements have marked different paths of growth in developed economies, being these differences more visible during the recent economic crisis. This is the objective of this paper, to have multiregional image of growth in developed countries, being elements such as capital accumulation, interrelations between countries or, specially, R&D expenditure key in our study.

In this preliminary study we work with WIOT tables from 1995 to 2011, adding data from OECD and WIOD social accounts. In first sections we will make a compare revision of WIOD tables, and then we will focus on R&D data trying to explain the final destinations of R&D expenditure of each country. In order to make calculus and understanding of results easier, we aggregate sectors and we work with seventeen sectors; primary sector, energy sector, food, beverages and tobacco sector, textile sector, paper and printing sector, coke, refined petroleum and nuclear fuel sector, chemical sector, rubber and plastics sector, other non-metallic mineral sector, basic metals and fabricated metal sector, machinery and equipment sector, electrical and optical equipment sector, transport equipment sector, manufacturing and recycling sector, construction, high technology services (where three sectors are included; post and telecommunications activities, financial and insurance sector and professional, scientific, technical, administrative and support service activities) and rest of services.

From WIOT data, first we will briefly comment how production and value added have progressed from 1995 to 2011, both at absolute and per capita terms; in order to have a first image of what has happened during this period. In this sense it is important to pay attention in sectorial specialization that offer us relevant information about the structure of economy of each country. For example, data shows that there is a common pattern in all countries, being sectors related to services the most important in developed economies, as it is expected.

In a second part, we will talk about trade between countries, focusing again on its sectorial specialization. This could led us to complete the previous image, since this globalize world makes interrelations between countries a significant variable to explain growth, as some papers try to show, like Pier Saviotti & Koen Frenken (2008). Analyzing WIOT tables we can say that in global terms countries tend to export products derived from industry of high and medium-high technology. However, countries like Canada, Indonesia or Russia, that are characterized for being rich in raw materials (such as petroleum), have their exportations centralized in energy sector, which is coherent with David Ricardo's theories. In terms of importations it is significant its variability and the increasing relevance of energy sector, that shows the increasing necessities of petroleum of different countries.

After this analysis we will focus on investment. We will study not only the internal investment but also the investment that each country received/send from/to others. As Antonia Diaz & Luis Franjo (2014) comment, it is not only important the amount invested but also the sectorial location, being a great example the Spanish case. It is observed that the major investment is realized in industry sectors and the exterior investment tend to be designated to medium-high technology sectors. It is relevant the evolution followed for investment, being rates of growth zero or negative from the beginning of the current crisis. In fact, countries like China or Mexico have average rates around 15%, whereas in USA it is observed an average rate of 4%. The question now is could it has been a previous symptom of a crisis? About these topics will argue in this paper.

In the final section, an important part of our paper, we will talk about the role of R&D expenditure in growth, being WIOD the scenery in which we will work. R&D data is obtained from OECD data base,

particularly from Structural Analysis databases and we use the file related to R&D expenditure in industry. However, we do not have data for all countries, such as Malta or Luxembourg. Besides, disaggregation by sectors is not the same for all countries (this is the case of China or Denmark). These problems create some difficulties that we have to deal with when we try to adapt R&D data to WIOT tables. In this section we want to offer a general view of the situation of R&D expenditure in each country, but not only this. Following Thijs ten Raa & Edward N. Wolff (2000), we are going to show and explain the final destinations of R&D expenditure through spillovers effects between sectors and countries, inside a multiregional mark, being this topic the most innovative question of our paper.