Knowledge-based Activities in Latin American Countries

LAKLEMS database: beyond "growth accounting" analysis

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OBJECTIVES

- Going a step further in the analysis of LA KLEMS countries' economic performance

- New applications of LAKLEMS data beyond "growth accounting" methodology

- Application of a new methodological approach for estimating the part of GDP based on knowledge-based assets: "knowledge-based GDP"

- To identify new information requirements for Latin American countries

Motivation

How is a knowledge-based economy measured?

The most common approach is to identify the activities or sectors with more R&D investment and highly qualified employment, and calculate their contribution to GDP and employment in the economy.

Based on this approach, the OECD usually refers to knowledge economy as digital economy, highlighting ICT-intensive sectors, such as, e-commerce, transport, education, health, etc.

Other approaches build indexes (i.e. Digital Economy and Society (Eurostat DESI Index) or KEI (Knowledge Economy Index), World Bank) based on various indicators on ICT use, human capital, information infrastructures, etc.

Motivation

What are the limitations to the approaches commonly used to measure the knowledge economy?

- They usually focus on sectors that create knowledge (ICT producers) and less so on sectors that use knowledge

- They focus only on a few factors such as skilled workers or R&D, excluding other important factors, such as intangible assets or other types of capital that use knowledge

- The intensity of the same knowledge-intensive sectors may differ among countries (research/innovative effort, level of human capital, etc.)

- The industry classification according to knowledge intensity depends on the selected threshold based on variables such as R&D&i intensity or educational level. Hence, a variation in the threshold would affect the weight of the knowledge economy

PROPOSED METHODOLOGY

Knowledge-based economy is defined as the knowledge embedded in both production factors, labour and capital.

The approach consists of measuring the value of knowledge-based activities taking growth accounting methodology as its framework, which measures the contribution by each productive input (basically, capital and labour) to gross value added (GVA).

The idea consists of measuring the knowledge-based economy by calculating which part of the GVA is dedicated to remunerating the production factors that incorporate knowledge:

- In the case of labour, the distinction among knowledge and non-knowledge is based on on the distribution by level of educational attainment and occupation
- In the case of capital, this distinction is based on the distribution by asset type.

KNOWLEDGE-BASED ECONOMY. Methodology

Knowledge-based economy is defined as the knowledge embedded in both production factors, labour and capital.

The approach consists in measuring the value of knowledge-based activities, using the growth accounting methodology as its framework, which measures the contribution of each productive input (basically, capital and labour) to gross value added (GVA).

The idea consists in measuring the knowledge-based economy by calculating the part of GVA which remunerates the production factors that incorporate knowledge:

- In the case of labour, the distinction between knowledge and non-knowledge is based on the distribution by level of educational attainment and occupation (Maudos et al., 2017).
- In the case of capital, this distinction is based on the distribution by asset type.

KNOWLEDGE-BASED ECONOMY. Broad approach

World KLEMS

- Country coverage: Brazil, Chile, Colombia, México and Spain
- Time coverage: 1990 – 2016
- Broad approach to measuring the knowledge-based economy

The knowledge-based economy is calculated as the part of GVA which remunerates the production factors that incorporate knowledge:

- In the case of **labour**, it is considered that workers with **high- and medium-education levels** contribute knowledge to the production process, whereas the rest do not.
- In the case of **capital**, it is considered that **ICT assets, transport equipment, and other machinery and equipment** are knowledge-based capital assets, whereas residential and non-residential structures are considered to have lower knowledge intensity.

KNOWLEDGE-BASED ECONOMY. Restrictive approach

Mas, Hofman and Benages (2018). IPM

- **Country coverage: Brazil, Chile, Colombia, México and Spain**
- **Time coverage: 2000 – 2016**
- **Restrictive approach to measuring the knowledge-based economy**

The knowledge-based economy is calculated as the part of GVA which remunerates the production factors that incorporate knowledge**:**
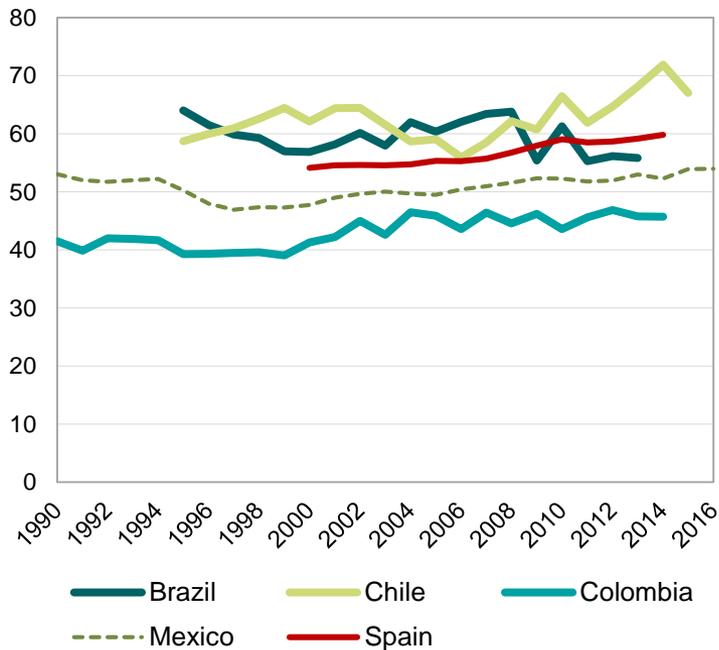
- ▪ In the case of **labour**, it is considered that only workers with **higher education** contribute knowledge to the production process, whereas the rest do not.
- ▪ In the case of **capital**, it is considered that only **ICT assets** are knowledge-based capital assets, whereas the rest of assets (transport equipment, other machinery and equipment, residential and non-residential structures) are considered to have lower knowledge intensity.

KNOWLEDGE-BASED ECONOMY. Broad vs. restrictive approach

Knowledge-based GVA. LA KLEMS countries and Spain, 1990-2016
(percentage over total GVA)

a) Broad approach. World KLEMS

b) Restrictive approach. Mas, Hofman and Benages (2018)