Sector relatedness, revealed comparative advantages and production in global value chains

Topic: Global Value Chain Analysis
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State of the art
A new way of thinking for a new economy is emerging; from a traditional approach based on final goods and services, to a global chain approach based on specific tasks and trade of intermediate goods. Previous research has exploited trade data to identify patterns of product relatedness based on common required capabilities that could guide diversification strategies. In particular (Hidalgo, Klinger et al. 2007) build a product space that relies on the fact that revealed comparative advantages are a reflection of a country pool of capabilities. However, in the 21st century trade, goods and services are the combination of capabilities and resources from different countries; making export data an imperfect measure of country capabilities (Baldwin 2008). Input-Output (I-O) tables are instead, a rich source of information to understand the position of countries on the international supply and value added chain. Measures of vertical specialization (Hummels, Ishii et al. 2001) and value added exports (Johnson and Noguera 2012) can be used to understand specialization patterns and returns appropriation along the global value chain (GVC).

Research gap
In a globalized world, it would be necessary to identify the contribution in value added of countries in the production of specific goods and services to indirectly measure existent capabilities. Taking advantage of linked input- output data, this paper contributes on that direction, exploring structural differences between the network of sectors based on gross exports, and the sector space based on value added exports. Such distinctions are informative about the way that potential patterns of related diversification are understood under diverse production modes at the global level. This paper takes an empirical approach to understand how important is the gap between trade statistics and domestic value added content of exports, and what is the effect of such gap on both, perceived competitiveness of countries; and sector relatedness.

Theoretical arguments
As the position along the GVC has an strategic value, changes from low value added segments to high value added ones characterize growth patterns were returns appropriation are higher. In the modern production system, were countries are specialized in particular tasks; both the kind of products and the stage in which a country adds value, are important to identify paths for diversification and growth. Under this perspective, structural change is constrained both by the capabilities accumulated by a country, and the pattern of linkages among products.

Method
Recently released World Input Output Database (WIOD) covering 40 countries plus an estimation of the rest of the world, and 35 sectors for the period 1995-2009 is used to carry a full decomposition of gross exports in value added components, following (Koopman and Wang, 2012) methodology. Balassa Reveal Comparative Advantage (RCA) indexes at sector- country level constitute the basis of sector networks, where sector linkages are cosine similarities based on value added exports. Network structure analysis is implemented, to understand similarities and differences between sector networks based on gross and value added exports. Patterns of connectivity, centrality and assortativity are studied from 1995 to 2009.

Results
Obtained results reveal an increase in production fragmentation at the country level during 1995 -

2009. The increased specialization of countries in specific segments of the GVC translates into a higher gap between gross and value added exports. The gap is considerably higher in manufacturing activities than in other sectors. However, such gap is not uniformly translated into differences in the distribution of revealed comparative advantages among countries. At the sector level a high degree of heterogeneity among sectors indicate that ordinal differences between both indexes can be quite high at lower levels of disaggregation.

There are important structural differences between network of sectors based on gross exports and the network of sectors based on value added. In particular, more opportunities for diversification in the short term are found if distances among sectors are based on value added instead than on gross exports. However, long term diversification opportunities are more constrained under a value added exports view. Diversification paths in the 21th century trade are more specialized than those existent under the 20th century view. Choosing the right diversification path seems now even more important than before.