GLOBALINTO
Capturing the value of intangible assets in micro data
to promote the EU's Growth and Competitiveness

Intangibles, Global Value Chains and Productivity Growth

GLOBALINTO workshop summary

The role of the diffusion of knowledge across countries and the participation of firms in Global Value Chains (GVCs) has gained increasing attention in recent years. This workshop examines the relationship between intangibles, GVC participation and productivity. The workshop will include presentations of recent findings and of the newly constructed GLOBALINTO Input-Output Intangibles Database that contains data on intangibles (and additional related competitiveness metrics) from 56 2-digit NACE Rev.2 industries for EU-27 European Union and UK.

The workshop was held on the 13th of April 2021 and included presentations by project members Senior Research Fellow Felix Roth of the University of Hamburg, Associate Professor Aggelos Tsakanikas of the National Technical University of Athens and Professor Ahmed Bounfour and Postdoc and Alberto Nonnis of the University of Paris-Saclay.

Introduction

Professor and GLOBALINTO project coordinator Hannu Piekkola of the University of Vaasa opened the workshop and introduced the topic of intangibles and global value chains. There is a great need for more research on intangibles due to the mismatch in the accounting of intangibles: Intangibles, such as marketing and ICT, are still mainly treated as an expenditure even though they should be viewed and treated as investments, as returns last well over a year. "In small and medium sized enterprises (SME's), there has been a growth of intangibles, without defined market price, producing

a lot of value added. Today's topic of Global Value Chains (GVC) is of high importance as it describes who gets the money earned with intangibles."

The workshop was chaired by Professor Carter Bloch of Aarhus University.

Revisiting intangible capital and labour productivity growth, 2000-2015 − Accounting for the crisis and economic recovery in the EU

Senior Research Fellow Felix Roth University of Hamburg, presented results from new work on intangibles and labour productivity growth, published special issue of Journal of Intellectual Capital. (Roth, 2020). He discussed on the related intan-invest (intangible capital) data and also ongoing research on using macroeconomic databases of EU KLEMS (tangible capital, labour compensation etc.).

From descriptive data, he highlights a large relative intangible capital in France and large relative share of R&D in Ireland (that is resulting from generous tax benefits) that should be treated as an outlier. As an interesting point of data, he notes that Italy and Germany are producing as much intangibles relative to GDP according to the current measurements in 2000-2015.

There are several reasons for why intangibles are important for labour productivity growth, presents Roth. Examples include branding that increases the attractiveness of products to customer and hence the trade price (Cañibano et al. 2000). Organizational capital, on the other hand, is the key to competitiveness as it is not exchangeable, it cannot be sold, and hence competitors are unlikely to be able to copy it.

Roth shows that intangibles are dominant source of labour productivity contributing up to 66% of EU's labour productivity growth in line with previous research of Roth and Thum (2013). When the exceptional case of Ireland is excluded, the share of intangibles' contribution to labour productivity remains over 40 %. Roth argues that the analysis "confirms that once intangibles are factored into the calculations, they become the dominant source of labour productivity growth in the EU".

It can be said that we are currently miss measuring the knowledge economy. Roth argues: "Firms already invest on these important investments but statistical collection is slow to follow"

He points out that during the financial crises 2008-2013, intangibles had a positive impact on labour productivity while the relation between tangible capital and labour productivity was negative. During the recovery period of 2014-2015, relationship between intangible capital and labour productivity growth was strong.

Roth noted that there is large variance in results concerning the share of intangibles' contribution to labour productivity, with other studies typically showing lower shares than found in his study. Carter Bloch asked about what could be possible explanations. Roth replied that the higher shares could reflect a greater ability to account for spillovers with

cross-country estimation. In addition, important control variables are often left out of analyses. Roth also informed that he is currently working on a follow-up study that also includes analysis at the industry level, and where preliminary results also support the results presented at the workshop (and in Roth, 2020).

The role of fiscal policy was raised by Ahmed Bounfour, with particular reference to developments in Ireland, according to Globalinto data, which has experienced a very strong increase in intangibles inflows in great part probably due to the existing intangible investment tax incentives.

Roth answered that mismeasurement is very likely to play a role here, but that the case of Ireland is due to the tax incentive in particular and cannot be seen to represent the effects of other, broader fiscal or monetary policies.

Joseph Lampel argued that the multinational companies can play a big role in these statistics, and often we do not have sufficient knowledge of how the placement of assets is related to the markets that these assets are ultimately directed towards. Roth agreed that there might be an issue with multinationals. GVC approach might be able to help us here but this needs to be started out. Examples such as where large multinationals such as Microsoft substantially increase investments into Ireland due to tax intensives – needs more attention.

Bounfour noted that large differences remain in how we measure organisational assets, from accounting standards

to those used in e.g. the Globalinto project and other work. Synergies are important but these can't be seen in the statistics. Calculating complementaries between assets, should we implicitly exclude organizational capital? Roth replied that the contribution of organizational capital is captured in the residual from TFP estimation.

The role of intangible assets and GVCs in European manufacturing competitiveness: Empirical evidence from the GLOBALINTO IO Intangibles database

Associate Professor Aggelos Tsakanikas, National Technical University of Athens, presented the results of a novel paper regarding the role of intangibles and participation in global value chains (GVCs) to European manufacturing competitiveness, utilizing data from the newly constructed GLOBALINTO I-O Intangibles database. Europe is an interesting focus area as its GVC participation has recently overcome the US and Japan's (Amador et al., 2015). Yet, there is a solid argument that this value chains are in fact regional and not global. "Intra-EU trade is a story as old as time", explains professor Tsakanikas. There is a mixture of headquarter economies that organize the production network (such as Germany) and factory economies that undertake the heavy industrial production (such as Poland). At the same time, the global economy is in transition towards the knowledge economy and technological changes have triggered a structural

transformation that increased the competitiveness of the former 'Factory Asia'. In this new reality, the control and proper utilization of intangibles in the global production network constitutes a major competitive advantage as intangibles have been identified as key elements for growth (Corrado et al., 2018; Piekkola, 2018; Roth, 2020).

In the first section, Tsakanikas presented the GLOBALINTO I-O Intangibles Database available in the GLOBALINTO website www.globalinto.eu and utilized in Tsakanikas, A., Roth, F., Caliò, S., Caloghirou, Y., & Dimas, P. (2020). The database measures intangibles as producer services that enter the production mixture of each industrial sector and derive from value key intangibles producing industries (by NACE Rev. 2 sectors: J62-J63 -Computer programming, consultancy and related activities; M72 - Scientific R&D; M73 Advertising and market research; N Administrative and support service activities) that were identified based on the work of Corrado et al. 2009 and Piekkola, 2011.

In this context, intangibles are treated as intermediate inputs that are purchased and traded by different industries across countries. An important novelty of the method is that intangibles used domestically can be separated from imports and exports of intangibles both at the industry and the country level. As a result, the database can be used to track the origin of purchased intangibles at the industry level and provide evidence regarding the trade in intangibles among different economies in the EU.

Data are calculated across 56 2-digit NACE Rev.2 sectors in each EU country, over the period 2000-2014. Under the scope, intangible inputs can be utilized to identify upstream and downstream activities across countries based on their intangibles intensity and the utilization of different types of intangibles inputs in their production mixture. Focusing on the manufacturing industries of the EU in the period 2000-2014, the between country trade of intangibles is trending upwards relative to mere domestic use intangibles, which can be seen as an evidence for a formation of innovation value chains. Comparing the pre and post-financial crisis periods (2000-2008 and 2011-2014 respectively) total intangibles utilization has overall experienced growth with the exception of the 2008-2010 where the effects of the crisis resulted in a sharp drop for every manufacturing sector in the sample. From the descriptive analysis, an interesting trend is a constantly rising share of imported intangibles that suggests that intangibles are an intermediate good traded in the inter-industry and inter-country trade and participating in the global production networks.

Another dimension of intangible assets that is not captured by intermediate inputs data is intellectual property. Utilizing patent statistics at the NACE Rev. 2 level industry from the EPO (also included in the GLOBALINTO I-O Intangibles database), we observe that intellectual property is concentrating on headquarters, typically in Germany, France and the UK, a fact that presents

evidence of a knowledge asymmetry between headquarter and factory economies, adding to the significant argument regarding to whom accumulates the value added across the value chain and how this accumulation occurs, which at the micro level is related with the control of key intangible assets and intellectual property (Durand and Millberg, 2019; Mudambi, 2009)

The second part of the study included correlations and a random effects panel estimation on a sample of 18 manufacturing industries from 18 EU countries to capture the role of intangibles and GVC participation to sector performance. Empirical evidence suggest that intangibles intensity has a positive correlation with sector performance (in terms of own contribution via the share of value added to total output). When accounting for origin, imported (domestic) intangibles are correlated with exports (patent applications). The results of the panel regressions suggest that imported intangibles support sector performance when the sector is also purchasing domestic intangibles. Another set of intriguing findings is related with the effects of GVC participation and patent applications in sector performance. In detail, GVC participation has a positive contribution to sector performance when combined with patent applications, a result that suggests that successful GVC participation is related with the production of innovation. On the other hand, backward participation in GVCs has a negative contribution to sector performance when examined separately from patent applications, a result that is intuitively related with the nature of activities and the fact that knowledge intensive inputs are separated via the introduction of the intangibles intensity parameters in the model.

Ahmed Bounfour commented on the volatility of intangible assets with respect to the economic crisis, elaborating on the different effects of the macroeconomic situation to different types of intangibles. Joseph Lampel added comments in the novel approach towards the quantification of intangibles with Aggelos Tsakanikas stating the fact that the novel database tracks purchased business intangible assets and not in-house production by each industrial sector. Another significant focus point of the discussion targeted the accumulation of intangibles' stock and how relevant calculations could be applied in the I-O framework of the database.

The combined contribution of intangible capital and global value chain participation to productivity

Professor Ahmed Bounfour, Université Paris-Saclay, continued on global value chain participation and intangible capital and combined them with productivity. Citing previous literature, we can say that both intangibles and participation into Global Value Chains, GVCs, (Baldwin et al., 2014) support productivity. In addition, investing in intangibles favours participation in GVCs (Jona-Lasinio et al., 2019).

Bounfour and his colleague Alberto Nonnis presented the results of their recent study of the role of intangibles, networks and global value chain participation: Nonnis, A., Bounfour, A., Özaygen, A., Kim, K. O., & Beliaeva, T. (2021) in International Journal of Intellectual Property Management.

The analysis applies a network perspective - GVCs can be seen as huge networks of exchanges between firms and industries located in different countries. The study uses input-output data at the industry level to be amended with GVC data that also includes the international industry-level flows by country of origin and destination and available in GLOBALINTO website, GVC participation is measured as the strength of exchanges among industries between countries. It is also possible to distinguish between the amount of inputs a sector receives from others (backward GVC participation) and the amount of inputs it supplies to others (forward GVC participation).

To explain productivity, Bounfour and Nonnis used two-step estimation with the Olley and Pakes method. In the first stage, production function is estimated accounting for endogeneity of physical capital. Resulting residual term is used as a proxy for productivity, TFP. Then, this TFP is explained by a measure of centrality in GVC, intangible capital types, interaction terms between intangibles and centrality, and controls.

They find that intangibles and GVC participation support productivity. When they considered combined effects of GVC and intangibles, they found that from three out of four types of intangibles, the interaction supported productivity. An interesting future perspective is how Covid-pandemic affects the potential of international trade and the combined effect of GVC participation and intangibles to support productivity. Result either could be greater development in globalisation or instead enhanced fragility – and a further question is how Covid-19 spread across countries and affect the operation of MNEs.

Acknowledgement

About the GLOBALINTO project

GLOBALINTO aims to develop and refine measures of intangibles at the micro level and amongst others as part of global value chains at the macro level and to use these measures to analyse the causes of the productivity slowdown and how productivity growth can be improved. We will work in co-operation with the National Statistical institutes towards the goal of integrating improved statistics into sustained, official statistical production. This will also ensure that the development of new methods to measure intangibles are promptly available in innovation design and growth promoting policies.

This work will utilize a wide range of data sources (including data on firm activities, R&D and innovation, ICT, employee occupations and education, input-outputs, and primary data collection from a pilot intangibles survey) to measure intangibles in both the private and public sector. Taking into account the difficulties in measuring intangibles at the micro level based on existing data, GLOBALINTO will also develop and conduct a survey of intangible investments and digitalisation under Covid-19, with the goal of improving parameters used in measurement of intangibles.

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More information on the research related to this policy brief can be found on the project website, www.Globalinto.eu

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