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TOPICAL ISSUES IN GLOBAL VALUE CHAINS RESEARCH: A 'FACTORY ECONOMY' PERSPECTIVE[1]

Abstract. *The dynamics of the global economy and international trade are increasingly characterised by global value chains (GVCs), within which intermediate goods and services are traded in fragmented and internationally dispersed production processes. Successful integration of firms and countries in GVCs is increasingly important for their development and integration in the international economy. Based on an analysis of conceptual, empirical an policy-related literature on (i) GVCs in development economics and international trade models, (ii) factors behind the proliferation of GVCs, (iii) development effects, benefits and risks of integrating into GVCs, (iv) importance of GVCs for international trade, (v) theoretical considerations and empirical evidence on firms' (MNEs') decision-making related to the establishing and modality of GVCs, (vi) GVC governance and upgrading a firm's position within a GVC, and (vii) GVC-related changes to economic policy, we identify the priority topics for future GVCs research that are the most important for the economies of catching-up countries ('factory economies') and their firms.*

Keywords: *global value chains, intermediate goods and services, international trade, foreign direct investment, arms-length transactions, network relations, vertical integration*

Introduction

Global trade, despite the crisis, tripled between 2001 and 2011, with the primary driver being China's membership in the WTO (2001) and the consequent mass relocation of manufacturing to China. In merely a decade China became 'the world's factory', where most of technological consumer

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goods are produced / assembled. This is reflected in the reshuffling of global trade flows: intermediate goods flows have been pulled to one direction and those of final goods to the other. This phenomenon is well illustrated by iPhone production in China. The production requires several hundred components, which, however, are mostly produced in other countries and imported to China where they are assembled into the final product. Statistically, the consequence of production within such a global value chain (GVC), organised by Apple, is multiple counting of export-import flows – first as components and then as final products. Economically, the crucial feature of GVC activity is the distribution of the creation of value added along the entire chain, spreading it internationally. Park et al. (2013: 82) look at a variety of definitions of GVCs and find them remarkably consistent, saying that

> *a chain is defined as the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use. [...] when these value chains span enterprises in more than one economy, they are termed global value chains.*

For the last 15 years, the functioning of the world economy and international trade has thus been increasingly characterised by GVCs, 'in which intermediate goods and services are traded in fragmented and internationally dispersed production processes' (UNCTAD, 2013a). GVCs are typically coordinated by multinational enterprises (MNEs). The increased presence of GVCs is a result of technological progress related to digitalisation, decrease of transport costs and barriers to international business, which facilitated the fragmentation of production processes to a number of individual phases and tasks. The creation of GVCs enables their lead agents, i.e. MNEs, to effectively exploit international differences in production costs, while on the other hand firms and countries integrated into GVCs may profit from almost immediate establishment of new, previously unavailable types of production, as well as other related benefits, such as new jobs, technology transfer and integration into MNEs' networks. It is widely accepted that integration in GVCs is one of the more promising possibilities for boosting growth and development, although the link is far from automatic and risk-free.

The importance of GVCs in aggregate terms is reflected in the value of foreign inputs (intermediate goods) in a country's exports as well as in the value of own inputs used in the exports of other countries (see also Rašković et al., 2015). In 2010, 28% of the gross value of world exports was accounted

for by foreign value added. This represents the value of imported inputs which countries built into their own exports. Moreover, in the same year almost 80% of world gross exports of goods and services were related to international production networks of MNEs (UNCTAD, 2013a: 125). The extent of a country's integration into international trade thus greatly and increasingly depends on the integration of its firms into GVCs.

The objective of this paper is to identify the GVCs research-related topics and issues that are the most important for the economies of catching-up countries ('factory economies', in the words of Baldwin) and their firms.[2] To do this, we concentrate on the following aspects of conceptual, empirical an policy-related GVCs literature: (i) GVCs in development economics and international trade models, (ii) factors behind the proliferation of GVCs, (iii) development effects, benefits and risks of integrating into GVCs, (iv) importance of GVCs for international trade, (v) theoretical considerations and empirical evidence on firms' (MNEs') decision-making related to the establishing and modality of GVCs, (vi) GVC governance and upgrading a firm's position within a GVC, (vii) GVC-related changes to economic policy. Furthermore, the structure of the paper follows the above list of GVCs-related topics and issues, and concludes with suggestions for future research.

GVCs in development economics and international trade models

Analysis of the determinants end effects of firms' integration in GVCs is based on theoretical premises of two streams of literature. The first is the literature on the economics and characteristics of GVCs as conceptualised by Baldwin (2011, 2012). Although based on the ability of a firm to fragment its production processes, it is mainly interested in the macro-development aspects of GVCs' expansion. The second stream are the international trade models, which analyse trade and foreign direct investment (FDI) at the firm level. These models incorporate product differentiation, monopolistic competition and firm heterogeneity, and explain MNEs' choices about the establishment and modality of a GVC, i.e. the decision whether a firm should produce intermediate products / components for its final products itself (vertical integration), or these intermediate products should be procured

[2] *The objective is linked to the fact that the paper is made within the project 'Determinants and effects of Slovenian firms' positioning in global value chains'. Intermediate goods account for the largest and increasing share of Slovenia's exports (57.4% in 2012, compared to 50.5% in 2009) and imports (63.4% in 2012, compared to 57.6% in 2009; SURS, 2013). Therefore, the question of Slovenian firms' integration in GVCs is of crucial importance for their integration in international trade and their development in general. The position of Slovenian firms in GVCs is very predominantly that of being integrated in other (leading) firms' GVCs. This is the aspect – upgrading of firms' position in GVCs and the development impact for respective economies – that this survey is primarily interested in.*

from independent external suppliers (outsourcing), and whether the integration / outsourcing should take place at home or abroad.

Importing intermediate products, processing / assembling them into final products and exporting the latter is the essence of GVC economics. The story of imported inputs is as old as cross-border trading, but GVC economics opens new analytical horizons. According to Baldwin (2013), the so-called second unbundling of the production phases, enabled by the revolution in information and communication technology (ICT) and made profitable by the labour-cost differences, has changed the core of both qualitative as well as quantitative aspects of importing inputs. Consequently, theoretical, analytical and practical business perspectives on the subject have also changed. First, the issue of outsourcing / offshoring came to the forefront. In the case of outsourcing / offshoring, the analysis focuses on the outsourcing / offshoring firms themselves and on the employment impact in home countries. Only relatively recently, the literature started to analyse and 'promote' the phenomenon under the term GVCs. From the point of view of the firms that outsource / offshore production phases (i.e. producers of final products), little is new in the conceptual / analytical setting. However, the GVC economics approach adds two new analytical aspects:

a. the impact on insourced / inshored countries, i.e. the question what the expansion of GVCs means for the competitiveness, industrialisation, technological restructuring and development of such countries; and
b. the importance of GVCs for exports, i.e. recognition that it is the exports of own value added that matters and not the gross exports, and that it is thus the former that should be analysed and used in the policy making.

The functioning of GVCs relates to

> *an intertwining of: (i) trade in goods, especially parts and components; (ii) international investment in production capacities, training, technology and long-term business relationships, (iii) the use of infrastructure services to coordinate the dispersed production [...], (iv) cross-border flows of know-how.*

Baldwin (2012: 8) refers to this as the 'trade-investment-services-intellectual property nexus', with MNEs as the main actors. In GVCs, we have the 'headquarter' and the 'factory' economies; the trade between the two is dominated by vertical specialisation based on labour cost differences. On the other hand, trade among headquarter economies themselves is based on horizontal specialisation and firm specific advantages (Baldwin, 2012; Gonzalez, 2012).

Existing conceptual and empirical literature on the economics and functioning of GVCs, which defines the conditions for the emergence and

expansion of GVCs and their development impact, has two basic deficiencies: (i) a lack of strong theoretical foundations which would enable the verification of testable hypotheses, and (ii) the lack of firm-level data means analyses are conducted at sector level, which is a deficiency because it fails to consider firm heterogeneity (see Greenaway and Kneller, 2007). These deficiencies are adequately eliminated by international trade theory, which analyses trade and FDI at a firm level, taking into account product differentiation, monopolistic competition and firm heterogeneity (Antras and Helpman, 2004; Grossman and Helpman, 2005; Helpman, 2006; Grossman and Rossi-Hansberg, 2008; Nunn and Trefler, 2008; Bernard et al., 2010; Antras and Chor, 2012; Antras and Yeaple, 2013; Helpman, 2013; etc.). These models – defining firms' behaviour as far as intermediate products procurement is concerned and fully integrating the premises of GVC economics on the fragmentation of production phases and the trade-investment-services-intellectual property nexus – show that heterogenous producers of final products choose different organisational forms of intermediate products procurement that vary with respect to ownership structure and location. Headquarter services are always provided at home (in a developed country), while intermediate products may be produced at home or in a less developed foreign country with lower labour costs; whereby the production of intermediate products may be owned by the producer of the final product, or by an independent supplier (Antras and Helpman, 2004).

Intermediate products account for a large and increasing share of the exports of catching-up countries. The extent of integration of these countries into international trade thus increasingly depends on the integration of their firms' into GVCs of other firms and on the creation of own GVCs. Existing analyses and related discussions on the integration in GVCs within development economics and international trade models are performed almost exclusively to sector level. This neglects the importance of firm heterogeneity, which is a serious shortfall. In this respect, future research should attempt to analyse the determinants and effects of the integration of firms into GVCs predominantly based on firm-level data. Such an approach enables a much more precise analysis of the phenomenon. So far, firm-level analysis using big databases has been neglected due to the exhaustive work load related to merging a number of different and very extensive databases.

Factors behind the proliferation of GVCs

The economics and functioning of GVCs has been conceptualised by Baldwin (2011, 2012). The starting point of GVCs economics is the so-called globalisation's 2nd unbundling, which shifted the locus of globalisation from sectors to stages of production. According to Baldwin, this requires

an analytical focus on fractionalisation and dispersion as the very nucleus of GVCs. Fractionalisation concerns the functional unbundling of production processes into finer stages of production, while dispersion concerns the geographic unbundling of the stages of production. Fractionalisation is governed by a trade-off between specialisation and coordination costs, and dispersion is governed by a balance between dispersion forces and agglomeration forces. The dispersion forces that encourage geographic unbundling include wage gaps (fostering North-South offshoring) and firm-level excellence (fostering North-North and South-South offshoring). Since the mid-1980s the ICT revolution has enabled certain stages of production previously performed in close proximity to be dispersed geographically, offshored and performed at distant locations, as it made possible to coordinate complexity at distance and thus reduce the costs and risks of combining developed economy technology with developing economy labour. This is the very essence of GVCs. ICT made the 2nd unbundling possible and wage differences made it profitable. FDI is the crucial integral part of GVCs, as within a GVC transactions and relations are not limited to goods, but are characterised by the trade-investment-services-intelectual property nexus (Baldwin, 2012.

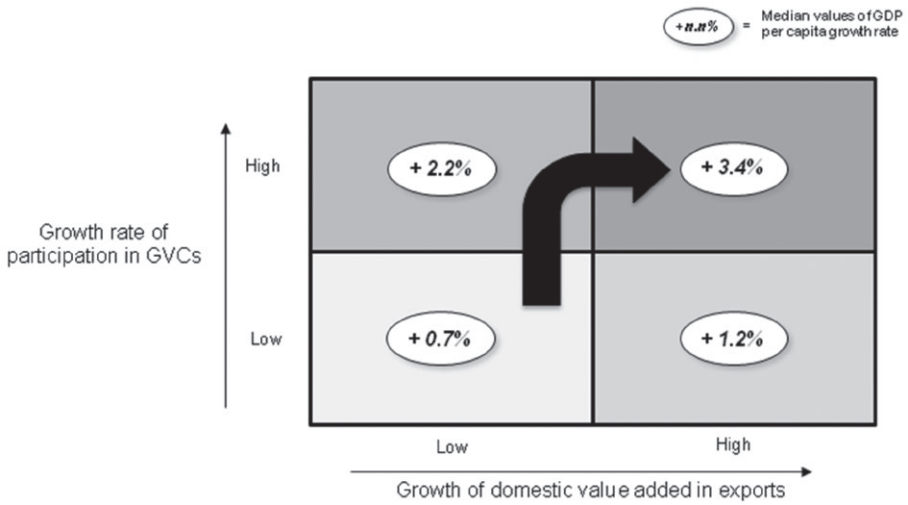
A comparison of GVC trade between headquarter and factory economies shows important differences. The first is that the chain trade between headquarter and factory economies is dominated by vertical specialisation based on wage differences, while the chain trade between headquarter economies, which is even more intensive, is based on horizontal specialisation and firm specific advantages. The second difference is related to the fact that exports of headquarter economies contain relatively little imported intermediates, while exports of factory economies contain a large share of imported intermediates (Baldwin, 2012). Gonzales (2012) finds that as nations get richer they use imported intermediates ('backward' supply-chain trade) more intensively in their exports. But only up to a certain point; beyond a threshold of per capita income of about USD 25,000, imports intensity diminish. For the supply of intermediates to others ('forward' supply-chain trade) the relationship is the other way around. It is low for low income levels but rises beyond a point near USD 15,000. The above pattern leads to a hub-and-spoke asymmetry in the dependence of factory economies on headquarter economies. GVCs also show strong regional concentration, which Baldwin (2012) calls Factory Asia, Factory North America and Factory Europe.

Development effects, benefits and risks of integrating into GVCs

Since 2012 the issue of GVCs has attracted considerable analytical attention of the institutions, such as the OECD, UNCTAD, the World Bank and the European Commission. It is the newly available up-to-date international

input-output tables which have made such analyses possible, as they enabled distinguishing between gross and net (added) value of international trade. The OECD (2012a, 2013a, 2013b), UNCTAD (2013a, 2013b) and the European Commission (2012, 2013a) extensively analyse development opportunities of countries' integration into GVCs, the related risks and the necessary policy measures. Positive development effects of integration into GVCs established by the above analyses are: (i) GVCs account for an increasing part of international trade, (ii) there is a positive correlation between participation in GVCs and per capita GDP, (iii) GVCs have a direct impact on value added, jobs and income, (iv) participation in GVCs improves a country's access to technology, skills and knowledge, and to the use of good practices in the fields of environment, innovation and social responsibility, (v) GVCs enable faster development of production skills and knowledge, and open opportunities for long-term growth. GVCs are also attracting increasing attention of academic researchers (see Stehrer et al., 2012; Baldwin et al., 2013; Baldwin and Lopez-Gonzalez, 2013; Foster et al., 2013; Jesmin and Zhao, 2013; Beltramello et al., 2012; De Backer et al., 2013; Gereffi and Fernandez-Stark, 2011; Cattaneo et al., 2013; Boc et al., 2013; Wignaraja et al., 2013; Feng et al., 2012), who mostly confirm positive effects of integration into GVCs.

Figure 1: GDP PER CAPITA GROWTH RATES FOR COUNTRIES WITH HIGH / LOW GROWTH OF PARTICIPATION IN GVCS AND HIGH / LOW GROWTH OF DOMESTIC VALUE ADDED IN EXPORTS, 1990–2010



Source: UNCTAD, 2013a: 170.

No doubt, the potential contribution of GVCs to the industrialisation and development of participating countries is considerable. By integrating into GVCs, factory economies increase the share of industry almost overnight and experience rapidly increasing exports of industrial goods. In the long term, however, integration into GVCs does not suffice without a country's own development strategy and without creating domestic value added. Figure 1 shows that countries with high participation in GVCs do achieve higher GDP per capita growth rates than countries with low participation, but real success is only achieved by the countries that, apart from high participation in GVCs, also exhibit high growth of domestic value added in exports.

What then does GVCs economics tell factory economies? Joining GVCs makes the industrialisation process and inclusion in international trade very fast but, as Baldwin (2012) puts it, industrialisation becomes less meaningful for the same reasons. Here, factory economies face two risks: the first is that integration in GVCs may not lead to real technology transfer, and the second is that there is no assurance that a country's place in the GVC is not taken by the next lower-wage country.

The first risk is related to the application of a lead firm's technology and know-how in a low-wage country. The internationalisation of value chains involves cross-border application of very specific slices of the lead / parent firm's know-how and keeping control over the use of this know-how is of critical importance to the lead firm. The result is that this is not a proper process of technology transfer of a broad range of productivity enhancing techniques but rather that of technology lending. A related issue is the pattern exhibited by the so-called smile curve (see Figure 4); i.e. lower value added stages of production (assembly, fabrication stages) are offshored while high value added stages (product concept, design, R&D, sales, marketing and after-sales services) are kept at home – a stage's share of the total value added of a product seem to shift away from the offshored stages. The conclusion is that the fabrication stages in manufacturing may not be the development panacea as they once were (Baldwin, 2012: 17–18).

With integration in GVCs, the factory economies have lots of industry and rapidly growing exports of manufactured goods, but they cannot be sure that their place in the GVC is not taken by the next low-wage country. This risk stems from the very mode of using technology and know-how for a particular production stage being transferred by a foreign lead / parent company to a low-wage country. Following the work of Puga and Venables (1996), Baldwin (2012) claims that productivity / wage growth induces firms to move offshore to a second location once a threshold wage is reached. The key point here is that the spread is not even – the departing industry does not spread out evenly, it concentrates in just one new location to benefit from agglomeration rents. Moreover, the relocation does not empty out

the first location / nation, but rather slows the growth of new manufacturing activity. As the second location's wages are driven up, a third location / nation emerges for offshoring.

Does this mean that increasing labour costs in factory economies necessarily leads to their gradual ousting from GVCs? No. At the next level, the convergent wages and income level between factory economies and headquarter economies need not reduce the extent of value chain trade among them. Indeed, the intensity of such trade among developed nations exceeds the trade between developed and developing economies since the gains from specialisation driven by firm-level excellence is even more important than the gains from specialisation due to large wage gaps. According to Baldwin (2012), such a pattern of development logically follows from the trade theory claiming that nations trade more – not less – as their economies get larger and more similar. In other words, countries develop to a stage when their inclusion in GVCs will be based on horizontal rather than vertical specialisation and will be included more via forward than backward supply chain trade. Theory tends to suggest that income convergence will gradually boost the supply chain trade in that the additional horizontal specialisation will more than compensate any reduction in the wage-driven vertical specialisation (Baldwin, 2012). GVCs economics thus claim to explain the structural and productivity development of factory economies' manufacturing beyond the labour intensive stages, but the mechanism of this catch-up is not really obvious as GVCs promote technology lending rather than technology transfer and the higher value added stages of production remain in headquarter economies.

Apart from the footloose character of GVCs and the risk of truncated transfer of technology, UNCTAD (2013: 148–174) brings forward the following possible reasons for insufficient and negative effects of integration into GVCs: (i) contribution of GVCs to GDP is limited if the share of locally created value added in a country is low, (ii) in developing countries a considerable part of value added is created by foreign subsidiaries, with a risk that only a small portion of this value added will remain where it is created, (iii) transfer of technology, skills and knowledge is not automatic, and with a lack of absorption capacity countries remain in low value added production phases.

Importance of GVCs for international trade

Koopman et al. (2010) did pioneering work in measuring GVCs and value added trade. As various production phases are usually performed in different countries, intermediate products cross borders several times. The consequence is that traditional trade statistics become an ever less reliable measure of value contributed by an individual country. Koopman et al.

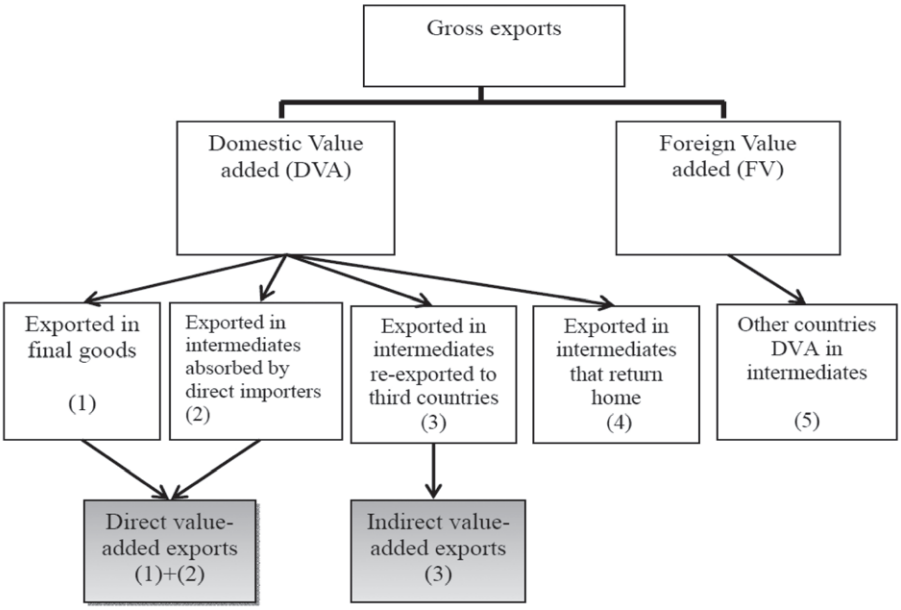
(2010) created a conceptual framework for decomposing a country's gross exports into value added components of the countries involved (see Figure 2, page 952), and created a new data base of bilateral value added trade. In this context, a GVC may be described as a system of sources and destinations of value added within a framework of a globally integrated production network. Within GVCs, every producer buys inputs and then adds value, which is included in the costs of the next phase of production. In every production phase when goods cross international border the flow of value added trade equals the value added paid to production factors in the exporting country. Since all official trade statistics measure trade in gross amounts, which include intermediate inputs as well as final products, the value of intermediate products crossing international borders is counted twice. The framework developed by Koopman et al. (2010) displays full decomposition of gross exports into their value added components, which enables trade statistics to be linked with the System of National Accounts. A truly global analysis of GVCs on this basis has been made possible only recently when various international bases of input-output tables have become available, such as the UNCTAD-Eora GVC Database, the Inter-Country Input-Output (ICIO) model (OECD/WTO), the Asian International I-O tables (Institute of Developing Economies, IDE-JETRO), the Global Trade Analysis Project (Purdue University) and the World Input-Output Database – WIOD (UNCTAD, 2013b: 3). Apart from the list above, important contributions for measuring trade flows via GVCs come from the OECD (2012a), the OECD-WTO project, Sturgeon (2013), Miroudot et al. (2009), Beltramello et al. (2012), Cattaneo et al. (2013), Gereffi and Fernandez-Stark (2011), etc.

The usefulness and higher policy relevance of statistical monitoring of international trade in value added instead of gross amounts is reflected in various issues, such as foreign trade balance or revealed comparative advantages. China's trade surplus with the USA / EU in terms of gross trade decreases by 41 % / 49 % if we measure mutual trade in value added. The reason for this is that Chinese exports contain a lot of inputs imported from the USA / EU. A typical case is iPhone – assembled in China (by Foxconn) – where the share of Chinese value added in gross exports value is only 2.5 %. After being assembled in China, the iPhone is imported by Apple in the USA for USD 144 (factory price) and sold at home for USD 299. Looking at the export-import flows in gross values, China has USD 144 of high-tech exports and the USA has the same amount of high-tech imports and of trade deficit. However, in the USD 144 of Chinese exports there is actually only USD 5 of Chinese value added contributed by Chinese workers assembling the phone while all the rest are inputs imported by China from abroad (Dedrick et al., 2008). Considering value added instead of gross exports and imports could also radically change the revealed comparative advantages of

a country, as demonstrated by Koopman et al. (2010) in the case of India. If we calculate revealed comparative advantages of India based on gross exports and imports, India has advantages in the business services sector. But quite the opposite is revealed if we make the calculations based on value added exports and imports. All this demonstrates the high importance and the necessity of using foreign trade data based on value added, not only for analytical reasons but even more so for adopting the right policy measures.

What is thus the importance of GVCs for international trade? International trade is increasingly dependent on GVCs, as 28% of world gross exports come from foreign value added, i.e. imported inputs which countries incorporate in their own exports (UNCTAD, 2013: 125). MNEs play the main role in GVCs and international trade in general. The UNCTAD (2013: 135) reports that in 2010 USD 15 billion out of the total USD 19 billion of world gross exports was related to international production networks of MNEs (USD 6.3 billion of which was related to intra-firm trade, USD 2.4 billion to trade related to non-equity forms of cooperation, and USD 6.3 billion was trade with independent firms). It is MNEs that typically coordinate GVCs; consequently, integration into GVCs depends on FDI penetration. Data show high correlation between the inward FDI stock and integration into GVCs for both developed and developing countries (UNCTAD, 2013: 138).

Figure 2: DECOMPOSITION OF GROSS EXPORTS



Source: Koopman et al., 2010: 34.

Theoretical considerations and empirical evidence on firms' (MNEs') decision-making related to the establishing and modality of GVCs

International trade models that explain trade from the firm viewpoint and incorporate product differentiation, monopolistic competition and firm heterogeneity are crucial for understanding the decisions of firms related to the creation of and integration into GVCs. These models explain firm's (MNE's) decision on whether it will produce intermediate inputs for its final products itself (vertical integration), or these intermediate products will be procured from independent external suppliers (outsourcing), and whether the integration / outsourcing will take place at home or abroad. The model of Antras and Helpman (2004), which represents the basic approach to modelling procurement with intermediate products, links together Melitz (2003) and Helpman et al. (2004) – who model the impact of intra-sector firm heterogeneity on the decisions of a firm on how to service markets – and Grossman and Helpman (2002) and Antras (2003) – who deal with the choice between procuring intermediate products via vertical integration and procuring them from independent suppliers (outsourcing). The model says that the most productive firms service foreign markets through FDI, less productive firms service foreign markets through exports, while the least productive firms service the domestic market. Among the firms that service foreign markets, the most productive vertically integrate procurement of intermediate products (with subsidiaries abroad producing intermediate products), while the least productive buy intermediate products from independent foreign firms (outsourcing abroad). The extent of vertical integration, i.e. of internalised (versus contractual) procurement of intermediate products, is manifested in intra-firm trade between the parent company and its subsidiaries.

Within the above general rule on the impact of firm heterogeneity in terms of productivity on the modes of servicing markets and procurement of intermediate products, there are important differences among firms that co-determine their decisions for internalisation (vertical integration) or contractually based procurement of intermediate products. In this regard, the crucial concepts relate to property rights theory and transaction costs theory (imperfect contracts theory). The more important property rights are for the firm's operations and the higher the transaction costs of contractual procurement of intermediate products the higher the share of internalised procurement of intermediate products will be compared to contractual procurement. Other factors that exhibit a positive impact on the level of vertical integration of procurement of intermediate products include trade barriers, sectoral dispersion of productivity (Antras and Yeaple, 2013; Yeaple, 2006; Nunn and Trefler, 2008, 2013), wage differences (Antras, 2003, Bernard

et al., 2010), the quality of institutions, etc. Also important are ownership advantages in different countries and the balance of negotiating power between the producers of final products and the suppliers of intermediate products. Lately, a number of analyses have appeared dealing with the issue of internalised versus contractual procurement of intermediate products based on individual firm-level data. They mostly confirm the above theoretical premises (Nunn and Trefler, 2008; Kohler and Smolka, 2009; Tomiura, 2007; Corcos et al., 2013; Jabbour, 2012; Marin, 2006; Altomonte and Rungi, 2013; Acemoglu et al., 2009; Fort, 2013).

Governance and upgrading in GVCs

The decision making related to the establishing and modality of GVCs is closely related to the issues of GVC governance and upgrading a firm's position in a GVC. If the governance issue is focused primarily on lead firms in GVCs, the upgrading issue is of primary interest to firms that integrate into GVCs. A related issue is the interdependence between the two, i.e. to what extent different types of GVC governance impact the upgrading of the positions of firms integrating in GVCs (Gereffi and Lee, 2012). According to Gereffi et al. (2005), the development of policy tools for industrial upgrading that are consistent with GVCs' governance framework is one of the most pressing areas in GVC studies.

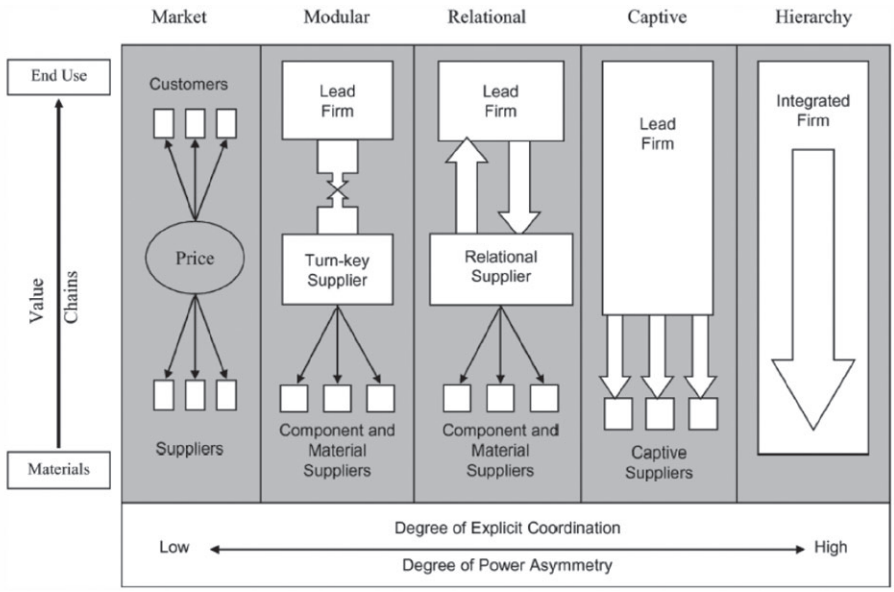
In a certain sense, the literature dealing with GVC governance further develops the topic of firm's decision making on the establishing and modality of GVCs, addressed in section six. GVC governance is about the authority and power relationships that determine the allocation of various resources and flows within a GVC (Gereffi, 1994). The most critical variables that determine how GVCs are governed and structured are the complexity of transactions, the ability to codify transactions, and the capabilities in the supply base. These variables are determined by the technological characteristics of products and processes, the effectiveness of industry actors and the social processes surrounding the development, dissemination, and adoption of standards and other codification schemes (Gereffi et al., 2005). In their seminal work on governance in GVCs, Gereffi et al. (2005) distinguish among five types of GVC governance depending on the role of the lead firm, ranging from market (arm's-length) governance, three types of network governance and the hierarchical type of governance (vertical integration) (see Figure 3):

- In *market governance* product specifications are relatively simple and transactions are easily codified, suppliers can make products with minimal input from and little coordination with buyers. Both buyers and suppliers have multiple sources of transactions, the price is fully

market-determined, and the cost of switching to new partners is low (example: commodity markets).

- In *modular governance* suppliers make products according to a customer's specifications that are complex but relatively easy to codify. By exchanging information in the form of standards, buyers and suppliers reduce coordination costs. The supplier is responsible for possessing the skills and technology as well as for the necessary capital purchases, and the cost of switching to a new partner is relatively low (example: electronics industry).

Figure 3: FIVE GLOBAL VALUE CHAIN GOVERNANCE TYPES



Source: Gereffi et al., 2005: 89.

- *Relational governance* is characterised by mutual dependence and high levels of asset specificity between buyers and suppliers, who rely on complex information that is not easily transmitted. Frequent interactions and knowledge sharing between buyers and sellers are based on mutual trust, family or ethnic ties, and the costs of switching partners are high (example: apparel industry).
- In *captive governance* small suppliers are dependent on a large buyer. The lead firm controls a highly differentiated product, the key technologies and / or product standards. Product specifications are complex but supplier capabilities are low, which results in a high level of intervention and control by the buyer. Suppliers are 'locked-in' with the buyer, i.e.

they face significant switching costs and are, therefore, 'captive' (example: Apple).
- *Hierarchical governance* is characterised by vertical integration and managerial control by the leading (parent) firm over its supplier subsidiary due to product complexity and concerns about intellectual property (example: certain car parts manufacturing) (Gereffi et al., 2005: 83–84; Gereffi and Lee, 2012: 25–26; Park et al., 2013: 83–84; Gereffi and Fernandez-Stark, 2011: 8–11; OECD, 2012b: 5).

The main concern of firms that integrate into lead firms' GVCs and of their home countries are the possibilities for and extent of upgrading their positions in GVCs, by moving to higher-value activities within the GVCs and thus increasing their benefits of participating in the GVCs (Gereffi and Fernandez Stark, 2011). The question is what is 'the extent to which GVCs are "inclusive" or "exclusive" in terms of facilitating the upgrading of lower-level firms in the chain' (Gereffi and Lee, 2012).

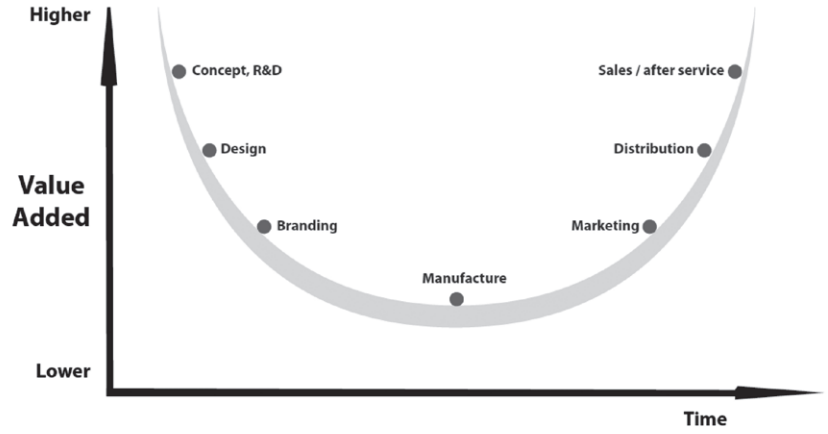
Based on Gereffi's (1999) analysis of experiences of East Asian apparel industry firms upgrading their positions in GVCs from original equipment assemblers (OEAs), to original equipment manufacturers (OEMs), to original design manufacturers (ODMs), and finally to own brand manufacturers (OBMs), Humphrey and Schmitz (2002: 1020–1021) identify four types of upgrading within GVCs:

- *process upgrading*, which entails transformation of inputs into outputs more efficiently by reorganising the production system or introducing superior technology;
- *product upgrading*, where a firm moves into more sophisticated product lines (which can be defined in terms of increased unit values);
- *functional upgrading*, where a firm acquires new functions (or abandons existing functions) to increase the overall skill content of activities;
- *chain upgrading*, where a firm moves into a new value chain (see also Kaplinsky and Morris, 2002; Gereffi and Fernandez Stark, 2011; Kaplinsky et al., 2002).[3]

While process and product upgrading are generally recognised in the economics of innovation, functional and chain upgrading are GVC specific; the former explaining a firm's changing position within the chain, and the second describing a move from one chain to another (Kaplinsky, 2013). Functional upgrading – as the most typical form of upgrading within a GVC – is represented by the so-called smile curve, denoting that functional upgrading means moving away from manufacturing to other functions.

[3] *For examples of practices and performance indicators of upgrading within these types of upgrading see Kaplinski and Morris (2002: 77).*

Figure 4: FUNCTIONAL UPGRADING ACCORDING TO THE SMILE CURVE



Source: Park et al., 2013: 132.

In spite of some criticism of Humphrey's and Schmitz's (2002) trajectory of upgrading within GVCs – automatism, simplification – and recognised industry and country specifics in the GVC upgrading patterns (Gereffi and Fernandez Stark, 2011; Park et al., 2013), most of the literature accepts the hierarchical upgrading trajectory from process, to product, functional and chain upgrading. According to Kaplinsky and Morris (2002), the most outstanding feature of this upgrading is that the trajectory involves a progressively higher content of disembodied activities (see Figure 5).

Figure 5: A HIERARCHY OF UPGRADING WITHIN GVCS

	Process	Product	Functional	Chain
Trajectory	↓ →			
Examples	Original equipment assembly (OEA) ↓ Original equipment manufacture OEM →	Original design manufacture →	Original brand manufacture →	Moving chains – e.g. from black and white TV tubes to computer monitors
Degree of disembodied activities	Disembodied content of value added increases progressively →			

Source: Kaplinsky and Morris, 2002: 40.

The dependence of the upgrading on the type of governance was addressed by Humphrey and Schmitz (2000, 2002), who found that captive governance fosters rapid process and product upgrading, but hinders functional upgrading beyond manufacturing. According to Park et al. (2013), more balanced types of GVC governance offer better conditions for upgrading; however, a high level of competencies already held by the supplier is a prerequisite for such a buyer-supplier relationship. Methodologically, the problem of analysing the interdependence of governance and upgrading is the formidable heterogeneity of processes and outcomes. Gereffi and Lee (2012) claim that this type of research requires developing precise indicators of upgrading relevant to supplier firms and their home countries. For acquiring this kind of information, they propose interviews with firms across the supply chain, gathering quantitative data via interviews and, finally, developing appropriate empirical indicators. In fact, one can see an increasing number of papers applying this and similar kinds of approaches.[4]

MNEs are the main actors of GVCs and a large proportion of GVCs comprises of vertical integration of parent companies and their foreign subsidiaries (hierarchical governance of GVCs). This makes another set of literature of relevance here, i.e. the literature on subsidiary development focusing on the process through which subsidiaries of an MNE enhance their resources and capabilities (for a review and conceptual analysis of subsidiary evolution see Birkinshaw and Hood, 1998). The literature (White and Poynter, 1984; Bartlett and Ghoshal, 1989; Young et al., 1988; Birkinshaw and Hood, 1998) points to the different roles subsidiaries play within an MNE (see Birkinshaw, 2001) and to the determinants of subsidiaries' upgrading. The underlying idea is that a subsidiary is 'not just an instrument of the parent, but has certain degrees of freedom in shaping its own destiny' (ibid.). Following Birkinshaw, Rugman et al. (2011) upgraded their matrix of home country and firm-specific advantages (CSA/FSA matrix), as the main building blocks of international business theory, in a way to incorporate subsidiary-specific advantages (CSA/FSA/SSA matrix). This way they put forward the possibility that a subsidiary's own initiatives lead to the upgrading of its mandate within the value-added chain inside its parent company network. Moreover, such recombination of home-host country advantages and

[4] *See, for instance, analyses for the automotive industry by Barnes and Morris (2004), Hatani (2010), Özata an (2011), Humphrey (2000, 2003), Lorentzen and Barnes (2004), Pavlinek and Ženka (2011), Quadros (2002), Sass and Szalavetz (2013), Sturgeon and van Biesebroeck (2011), Sturgeon et al. (2008); for the ICT and electronic industry by Ernst (2008, 2013), Cooke (2012), Azadegan and Wagner (2011), Kadarusman and Nadvi (2012); for the textiles and apparel industry by Aspers (2009), Azmeh and Nadvi (2014), Gereffi and Frederick (2010), Goto (2007), Nadvi (2008), Palpacuer et al. (2005), Schmitz (2006), Smith et al. (2014), Tokatli (2013).*

parent firm-subsidiary specific advantages is an additional source of MNE competitive advantage (Rašković, 2014).

In line with the subsidiary development literature (Birkinshaw, 2001; Paterson and Brock, 2002), Majcen et al. (2009) put forward three determinants of upgrading in subsidiaries: autonomy / control, competencies and national differences (the local environment). These three aspects of subsidiary development are essential for understanding the current and potential growth of subsidiaries. The importance of autonomy / integration stems from the recognition that a subsidiary's growth is significantly determined by its relationship with the headquarters. In subsidiaries where all functions are tightly controlled and which are very dependent on the parent, local managers have no freedom to exploit the opportunities for productivity growth. The role of competencies in subsidiaries relates to unique competencies that enable them to achieve a considerable degree of autonomy. Host country factors refer to the linkages to local firms and the country-specific factors that enable or hinder subsidiary development. Majcen et al. (2009) claim that a subsidiary can upgrade its position through: (i) functional upgrading (operations, marketing, strategic functions), i.e. by adding new mandates or functions; (ii) expansion of business lines (product diversification), i.e. new lines of business (products); (iii) upgrading value added (sales expansion) by extending the scale of its mandate through increased sales and exports. Pananond (2013) proposes another type of subsidiary upgrading by undertaking outward FDI in more advanced countries.

To the extent that subsidiaries in host countries create their own local chains of suppliers, the issue of hierarchical type of GVCs is linked to the so-called vertical spillovers from foreign subsidiaries to other host country firms, more precisely to backward vertical spillovers when domestic firms are suppliers of foreign subsidiaries. Authors who explicitly underline the notion of vertical spillovers in the literature, like Blalock (2001), Schoors and van der Tol (2001), Smarzynska-Javorcik (2004), and Damijan et al. (2013a), all provide evidence of positive FDI spillovers through backward linkages. The most important channels of backward linkages are direct knowledge transfer, higher requirements for product quality and on-time delivery introduced by MNEs, and the fact that an MNE's entry can increase demand for intermediate goods.

GVC-related challenges for economic policy

Proliferation of GVCs brings about important implications and challenges for economic policy. The first is the need to simultaneously take policy actions in the direction of enabling / promoting integration into GVCs

as well as fostering the upgrading of firms' position in GVCs. The second is the necessity of close coordination among various policies, and the third is awareness that integration in GVCs brings opportunities as well as risks, the latter needing to be avoided as much as possible.

The policies that enable and promote firms' integration into GVCs include a wide variety of policy measures. The OECD (2012b) classifies them into: (i) infrastructure conditions and policies affecting the use of infrastructure that affect 'getting to the border', (ii) costs imposed at and behind the border (border procedures, tariffs, non-tariff measures), (iii) barriers to FDI, access to services, information flows and international transport, and (iv) specific policy regimes, such as special economic zones and regional trade agreements.[5] Obviously enabling firms to integrate into GVCs is related to a great variety of infrastructural and policy issues, but even the list provided by the OECD is not comprehensive enough, i.e. one should add at least intellectual property rights protection, cross-border labour flows, all the policies that influence FDI, etc. In short, to enable and promote integration of firms into GVCs, all the policies related to Baldwin's trade-investment-services-intellectual property nexus are relevant.

In making GVCs-enabling policies, the crucial thing is awareness that we can no longer treat policies related to imports / exports, FDI, intellectual property rights, services and cross-border labour flows as separate policies. All these policies are important for GVCs, restrictions or inadequate policy in one aspect can also have negative consequences for other aspects. For instance, restrictions or inadequate policy in the field of FDI now in fact also restricts own imports and exports of intermediate products for making own exports more competitive. Inadequate intellectual property rights protection means less inward FDI and consequently less own exports, etc. What we traditionally see as entirely internal economic policy is now increasingly a matter of international economic relations policy (see Baldwin, 2012).

Putting adequate GVCs-enabling policies in place is, however, only the necessary condition for a country and its firms to benefit from GVCs, in terms of competitiveness and development. The sufficient condition is that firms integrating into GVCs obtain a proper position in GVCs and upgrade this position. As we claim in the previous section, upgrading firms' positions in GVCs is of crucial importance for the competitiveness / development impact of a country's integration in GVCs. By upgrading their position in GVCs, the firms and the countries involved may reduce the risk of being stuck in low value added activities and / or being phased out of GVCs and easily supplanted by firms from the next lower-costs country.

The UNCTAD (2013a: 175–202; see also OECD, 2013b) puts forward

[5] *On the link between GVCs and trade policy, see also Park et al. (2013).*

the following most important economic policy activities for increasing the development impact of integration into GVCs:

a. Integration of GVCs in a country's development strategies: (i) integration of GVCs in industrial policy, policy for promoting competitiveness and development; (ii) when defining objectives of development strategies, policy makers should take into account the development patterns followed by GVCs.
b. To enable integration into GVCs: (i) creating and maintaining a stimulative environment for investment and trade, (ii) assuring infrastructural conditions for integrating into GVCs.
c. Development of domestic production capacities / capabilities: (i) supporting development of domestic firms and strengthening their bargaining positions, (ii) strengthening of labour force capacity.
d. Ensuring high environmental, social and management standards: (i) minimisation of negative effects and risks related to integration into GVCs via regulation, private and public standards, (ii) supporting domestic firms in achieving international standards.
e. Ensuring and achieving synergies of trade and investment policies and institutions: (i) ensuring harmonisation of trade and investment policies, (ii) ensuring and achieving synergies in promoting trade and investment, (iii) creating regional development clusters.

According to Kaplinsky and Morris (2002: 103), nowadays 'a country's ability to generate highly skilled competencies and skilled personnel becomes its greatest asset in being able to positively integrate into GVCs'. To increase this ability, they suggest policy makers foster the resource development and capacity expansion of the national system of innovation. This way, a country would raise the general knowledge-intensive environment and assist firms in acquiring new – knowledge-intensive process – competencies of relevance for higher value added phases and functions of GVCs.

The fact that MNEs are the main actors of GVCs and that a large proportion of GVCs is vertical integration of parent companies and their foreign subsidiaries puts FDI policy in the core of GVCs promotion-related policies. The basic cognition here is that FDI policy per se has a rather limited scope. Thus, proper policy in favour of upgrading the position of subsidiaries in their foreign parent companies' GVCs could only be a coordinated policy framework, with FDI policy being only one segment. In order to assist in upgrading the positions of their firms in GVCs – i.e. to facilitate knowledge transfer from parent companies to their subsidiaries in a host country, upgrading subsidiaries to higher value added activities and new functions, as well as knowledge spillovers to the domestic economy – the host country's policies related to governance of science and technology, research

and development and innovation, education and training, etc. are of specific importance. As far as specific FDI policy measures that would assist in upgrading the position of the host country's firms in GVCs is concerned, more emphasis should be put on: (i) linkage promotion programmes and strengthening the absorptive capacity of domestic firms, (ii) promotion of R&D capabilities and technological linkages, (iii) promotion of FDI in high-tech industries, (iv) providing incentives for training of highly skilled employees, (v) creation of industrial, technological and science parks (Jindra and Rojec, 2014).

Conclusion

The dynamics of the world economy and international trade are increasingly characterised by GVCs, within which intermediate goods and services are traded in fragmented and internationally dispersed production processes. The proliferation of GVCs stems from the technological progress related to digitalisation, and decrease of transport costs and barriers to international business, which have facilitated the possibilities of fragmenting the production processes to a number of individual phases and tasks. The creation of GVCs enables their agents (i.e. MNEs) to effectively exploit international differences in production costs, while on the other hand firms and countries integrated into GVCs may profit from almost immediate establishment of totally new, previously unavailable types of production, as well as all other related benefits, such as new jobs, technology transfer and integration into MNEs' networks. It is widely accepted that integration in GVCs is one of the more promising possibilities for increasing growth and development potential, although the link is far from being automatic and without risk.

Slovenia is a small, open economy in which intermediate products account for the largest and increasing part of exports (57.4% in 2012) and imports (63.4% in 2012) (SORS, 2013) and are thus the main lever for the integration of Slovenian firms in international trade. A large share of Slovenia's trade flows at firm level consists of simultaneous import and export of identical products, i.e. the so-called pass-on trade. According to Damijan et al. (2013b), 70% of all Slovenian exporting firms engage in pass-on trade, making imported products that are exported again by the same firm a statistical regularity of trade of Slovenian manufacturing firms. Clearly, the question of integration in GVCs is of crucial importance for a large majority of Slovenian exporting firms.

Successful integration of any country and firm into international division of labour, and even more so of firms from small factory economies thus increasingly depends on the intensity and quality of its integration in other

firms' GVCs and on the creation of own GVCs. Therefore, the real GVC-related question for countries and firms is not whether to integrate or not – wishing or not, firms do integrate in GVCs one way or another, and the same goes for their competitors; i.e. they both face the same challenges and requests – but how to use integration into GVCs for their own growth and development, how to achieve a better / more stable position and how to upgrade their position in GVCs. Along these lines, the priority orientations of future research of country / firm integration in GVCs are to analyse:

- the stage of a country's manufacturing industry integration in GVCs (at aggregate but primarily at sectoral level), and the dynamics of passing through individual phases;
- the impact of integration into GVCs on the dynamics and structure of firms', industries' and aggregate economy's value added, and on the technological restructuring of the economy;
- inter-country differences in the effects of integration into GVCs on productivity, exports and employment growth, as well as innovation and technological restructuring;
- the extent / importance of individual modalities of firms' integration into GVCs, distinguishing among arm's-length, network and vertical integration;
- the factors determining the ability of a firm to integrate into various modalities of GVCs;
- the impact of (various modalities of) integration into GVCs on firms' survival, growth of value added, sales, productivity and employment;
- the impact of integration into GVCs on firms' exports growth, as well as intensive and extensive export margins (exports-to-sales ratio, types and diversity of export products, number of export markets);
- factors determining integrating firms' success in upgrading their positions in GVCs;
- identification of measures for a more intensive integration of firms into GVCs and for upgrading their positions in GVCs.

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