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Economic and Social Upgrading Dynamics in Global Manufacturing Value Chains: A Comparative Analysis

Thomas Bernhardt[†] and Ruth Pollak¹

Abstract

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JEL: F14, F63, F66, O19, O57

Keywords: global value chains, economic upgrading, social upgrading, apparel, automotive, mobile phones, wood furniture

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¹ The authors currently work as consultants at the Research and Industrial Policy Advice Unit of the United Nations Industrial Development Organization (UNIDO). The views expressed herein are those of the authors and do not necessarily reflect the views of UNIDO. Contact: t.bernhardt@unido.org and r.pollak@unido.org.

1. Introduction

Facilitated by the liberalization of goods and capital markets and fueled by reductions in transportation and communication costs, the international geography of production changed significantly in the later decades of the 20th century as multinational corporations and lead firms increasingly offshored production processes and tasks. This has led to the emergence of transnational production networks and global value chains (GVCs) linking groups of producers across the world in order to supply markets in different countries.

It is commonly argued that this international fragmentation of production provides developing nations the opportunity of participating in global trade in a way that was not possible before. Developing countries are no longer required to develop capabilities to produce entire products and to directly compete with advanced nations, but can instead focus on specializing in certain stages of the production process. Indeed, the offshoring of production by lead firms has provided a stepping stone for developing country suppliers to integrate into the global economy and to enter the production of products that are more sophisticated than the goods they typically produce. Participation in GVCs is often seen as bearing potential for propelling economic development because, in addition to generating income, it can facilitate access to external and diversified markets, technology and knowledge transfer, and capability-building through learning.

However, participation in GVCs can also lock firms and countries in activities where they rely on low labor and production costs as their key competitive advantage with little value added and meager prospects for learning and spillover effects. In fact, lead firms often outsource those activities that are characterized by low skill and technology requirements and low entry barriers, which fuels competition among suppliers, making it difficult for them to capture value-added and raise profits and wages (Kaplinsky, 2005).

Therefore, in order to benefit from the opportunities offered by the globalization of production, firms and indeed entire industries within a country need to economically upgrade. The question is how widespread such economic upgrading really is and, in case it actually takes place, how beneficial it is for local producers and workers. This paper suggests a framework to address this question. Using a *parsimonious approach*, based on a narrow set of indicators and quantitative secondary and internationally comparable data, it looks at key exporting countries in four selected GVCs (apparel, wood furniture, automotive, and mobile phones manufacturing) and tries to gauge the extent to which economic as well as social upgrading have occurred during the past decade.

Such an approach enables us to make comparisons across countries (e.g., developing versus developed), regions and GVCs. It, thus, allows us to provide a bird's-eye view on economic and social upgrading in GVCs, which complements the existing case study literature and more detailed studies of individual value chains. It also enables us to undertake initial investigations on the relationship between economic performance and social performance. Is economic upgrading typically associated or correlated with social upgrading or not? Indeed, concerns are growing that the economic gains of integrating into GVCs do not necessarily translate into social improvements.

The paper is structured as follows: Section two presents key conceptual considerations on GVCs and upgrading which provide the basis for our empirical investigations. Section three describes the methodology used for the analysis. Section four presents the findings on economic and social upgrading trajectories for each GVC. Section five provides a cross-GVC analysis and focuses on the relationship between economic and social upgrading. Section six concludes and points to critical considerations and possible further research.

2. GVCs and upgrading: Some conceptual considerations

Earlier literature emphasized that participation in global value chains can offer firms in developing countries the chance to obtain access to new markets and technologies and to acquire knowledge and information from lead firms (Gereffi, 1994, Pietrobelli and Rabellotti, 2006). Firms' actual experiences, however, have not always been so ideal. The array of paths firms have undergone through the insertion into value chains can be summarized into two broad categories: the *low road* and the *high road*. Low road is the trajectory of firms who are locked into low value-addition activities and (Kaplinsky 2005; Milberg and Houston 2005) and who fight to stay competitive on the basis of their low costs mainly achieved through near-exploitative wage rates. High road is when value added increases as a result of innovation, often facilitated through knowledge acquired from other firms in the chain. This is considered *economic upgrading*.

Humphrey and Schmitz (2002) identified four forms of economic upgrading which are now common terminologies used in GVC literature. These are i) process upgrading (increasing efficiency through the reorganization of production or introduction of new technologies), ii) product upgrading (the move towards more sophisticated or higher-quality product lines), iii) functional upgrading (increasing the range of functions performed or changing the mix of activities towards higher value tasks), iv) inter-chain upgrading (capitalizing on capabilities acquired in one chain to enter another, technologically more advanced chain). The integration of new firms into a value chain can require but also support these forms of upgrading.

Nonetheless, the opportunities to upgrade will depend on a range of factors. According to Pietrobelli and Rabellotti (2006) a firm's potential to upgrade will be influenced by

“(...) firm-specific efforts and actions and by the environment in which firms operate. The firm's environment is crucially shaped by three characteristics: (1)

the collective efficiency of the cluster in which [firms] operate, (2) the pattern of governance of the value chain in which [firms] participate, and (3) the peculiar features that characterize learning and upgrading patterns in specific sectors”

GVC governance is about coordination and control mechanisms and the distribution of power and value capture along the chain and, thus, is important in shaping upgrading opportunities. Early research divided GVCs into two groups according to the dominant governance structure, distinguishing between producer-driven GVCs (especially in capital- and technology-intensive industries where power lies mostly in the hands of final-product manufacturers) and buyer-driven GVCs (in consumer goods industries where retailers and marketers of final products derive power from their ability to shape mass consumption thanks to large purchasing volumes and strong brand names). Knowing if the lead firm in a chain is a buyer or a producer can help to determine the most likely upgrading opportunities for suppliers.²

More recent research refined this dichotomy and elaborated a new typology of GVC governance structures. Gereffi et al (2005) and Humphrey and Schmitz (2000) distinguished between different forms of GVC governance and assert that with a certain level of power asymmetry between the lead firm and suppliers to the chain, product and process upgrading may be possible and even supported, but functional upgrading is more likely to be hindered.

Looking at Latin America, Pietrobelli et al. (2006) study the *specificities of certain sectors* to identify whether there is an association to any governance structure and upgrading trajectory.

² For example, as Gereffi (2014, p 22) writes, “*buyer-driven chains tend to provide more opportunities to their suppliers in product and functional upgrading because the core competence of the buyers is in marketing and branding, not production, whereas lead firms in producer-driven chains often require varied forms of process upgrading and international certifications among their suppliers due to strict quality and performance standards that affect the entire chain.*”

For what they call *traditional* manufacturing sectors (where buyer-driven chains are common and which include apparel and furniture which will be analyzed below), , the impacts of lead firms on suppliers were summarized as positive for both product and process upgrading, as both technology and skills are commonly transferred (Henderson et al. 2002). Nonetheless, there tends to be a negative impact on functional upgrading. For *complex* product sectors (including the automotive and mobile phones sectors which will also be studied here) where producer-driven chains dominate, their finding for their Latin American sample was that the role of lead firms for supplier upgrading opportunities was less pertinent. Instead, product and process upgrading are rather prerequisites for suppliers to even be considered by lead firms.

Alongside governance structures and sector specificities, local conditions such as government support, firm ownership and embeddedness, and local firm interaction are also important determinants of economic upgrading. Collective efficiency and tacit knowledge acquired through inter-firm linkages can support smaller firms in particular (reference) and the role of national institutions, including research centers, trade associations and aspects of a business-enabling environment are not to be underestimated (Morris and Staritz 2014).

While earlier GVC studies focused on economic upgrading, the consequences of such upgrading on workers were significantly less researched and only recently are receiving more attention. Nonetheless, researchers seem to agree that economic upgrading generally leads to increased *employment* opportunities for people in developing countries, and often so, for people who were previously marginalized from wage employment, such as women and unskilled workers (Milberg and Winkler, 2011). The effect of economic upgrading on the *quality of jobs* is, however, less clear and often complex.

The term *social upgrading* is commonly used to describe improvements in the wellbeing of workers. In its broad sense, it encompasses both measurable standards (e.g., wages, type of

employment, working hours, and social protection) as well as non-quantifiable aspects (e.g., enabling rights such as non-discrimination and harassment, freedom of association and empowerment) (Barrientos et al, 2011). Similarly to economic upgrading, the extent of social upgrading will largely be influenced by factors other than governance structure. Labor regulations and labor unions are critical, as well as opportunities for acquiring new skills relevant for employment (Selwyn 2013).

Case study literature has started to shed light on the relationship between economic upgrading and social consequences of GVC participation. Nadvi (2004) finds significant positive impact on wages in the garment and horticulture industries across several countries observed, while Bair and Gereffi (2001) reported improvements in labor conditions in the Torreon cluster in Mexico.

In a study of the Moroccan garment sector, Rossi (2013) finds that process upgrading is associated with social upgrading, as increased efficiency in production lead to the reduction in excessive overtime worked, higher health and safety standards and other improvements in measurable standards. The relationship between product upgrading and social upgrading, she states, is less clear.

As suppliers are pressured by lead firms to maximize quality while reducing costs and ensuring flexibility and short lead times, different types of workers can have different experiences: For the more skilled workers, who ensure quality of production and who are employed under regular contracts, working conditions can improve while less skilled irregular workers, who ensure prices can be kept low and flexibility high, tend to experience social downgrading, through low wages, precarious working conditions, discrimination at the workplace and so forth (Barrientos et al. 2011,). As Rossi (2013) finds in her study, this is most common in cases where firms go through functional upgrading.

To sum up, economic and social upgrading are complex, multi-dimensional and often contested and, thus, unsteady processes. Economic upgrading can be understood as firms – or indeed networks of firms or entire sectors – embarking on a *high road* to competitiveness – which is in contrast to a *low road* trajectory where firms try to compete on the basis of low costs rather than economic upgrading. Social upgrading is often assumed to be a side effect or almost automatic consequence of economic upgrading but research on this topic has only recently begun. Case studies show mixed results but suggest that in some cases economic upgrading is associated with social upgrading; however, a systematic investigation is still missing. These conceptual considerations and initial case study findings form the backdrop of our empirical analysis to follow.

3. Methodology and selection of GVCs and countries

This paper analyzes economic and social upgrading in four GVCs and for over 30 countries in each GVC to provide a broader picture of upgrading trends and shifts. With this we aim to scale up the scope of analysis which until now has predominantly been that of individual case studies. While this clearly means that many of the details that in-depth case studies can provide on individual experiences are lost, our approach allows us to identify upgrading dynamics and patterns across GVCs and countries from a bird's-eye view. In order to facilitate the assimilation of such a large quantity of information, the paper adopts a parsimonious methodology using country-level data which is quantifiable and internationally comparable. We therefore view our paper as complementing the case study literature, and vice versa.

3.1 Economic upgrading

As part of our parsimonious approach, we follow Kaplinsky and Readman's (2005) and Amighini's (2006) definition, whereby a country has experienced *economic upgrading* in a given GVC if it:

- (1) increased its export unit values³ relative to the industry average, and
- (2) increased its world export market share.

Conversely, a decline in both indicators is interpreted as economic downgrading within the respective GVC. Export unit values are commonly used as surrogates for prices and, consequently, as proxies for product quality (Aiginger, 1997). We use the growth differential between a country's export unit values and the global industry average as one indicator.⁴ This gives a better idea of performance *relative* to the world average and, in a sense, allows us to take account of sectoral inflation (e.g., price increases of inputs that affect producers worldwide). In principle, however, an increase in (relative) export unit values can be the result of rising production costs rather than successful upgrading (reflecting, for example, inefficiencies in production or an increase in the technology gap relative to the frontier). For this reason, we use the change in world export market shares as a complementary indicator in our analysis. In order to capture the dynamic nature of upgrading (or downgrading) as a process, it is essential to look at changes in these complementary indicators over time.⁵

³ Export unit values are calculated by dividing the total value of a country's exports (of a certain commodity or product group) in a given period by the quantity or volume of these exports.

⁴ Export unit values are a nominal concept so they can be driven by increases in input factor and other production costs. Increases could, thus, be misinterpreted as "economic upgrading". To avoid such a measurement bias and to adjust for sector-wide inflation, we decided to "deflate" each country's export unit value growth by the world average growth rate.

⁵ Instead of using export data, another possibility would be to use data on trade in value-added (TiVA) and world input-output data (WIOD) which has recently become available, see http://stats.oecd.org/Index.aspx?DataSetCode=TIVA_OECD_WTO and www.wiod.org. These data net out foreign (i.e., imported) content/inputs from a country's exports, thereby helping to capture more accurately the extent of domestic value addition in a country's exports; an increase in this share could be taken as another proxy for economic upgrading. However, there are two reasons why, at the moment, these data sources are of limited

Progress on these two indicators might be interpreted to reflect product upgrading, functional upgrading or process upgrading (see section 2 above) – or a mix thereof. However, while the indicators allow us to observe the *outcomes* of economic upgrading processes, they do not reveal which of the different upgrading forms actually led to this performance outcome. The fourth form of upgrading presented in section 2, inter-chain upgrading, cannot be directly captured by the indicators we use. Note that economic downgrading within a sector is not necessarily an undesirable outcome, but may be a manifestation of the country's economy undergoing a process of structural change, i.e. a shift in the composition of economic activities towards sectors with higher value-addition.

3.2 Social upgrading

Following Bernhardt and Milberg (2013), a country is defined to have experienced *social upgrading* in a given GVC when there was a combination of:

- (1) an increase in employment, and
- (2) an increase in real wages.

Through the creation of jobs, labor is given the possibility to earn an income, and, if they are formal, may provide social insurance and certain employee benefits. Real wages, on the other hand, can be used to measure how much workers benefit economically from the value created by GVC-related production in their country. This is clearly an oversimplification of the concept of social upgrading as it looks at only two of a long list of possible indicators for measuring it, and while real wages may be associated with quality of employment, they are

use for our analysis which is particularly interested in the performance of developing countries in more narrowly defined GVCs: First, data are available for a limited number of mainly advanced economies only. Second, data are reported for rather broadly defined industries. We therefore leave it to future research to complement our and other GVC research through the usage of TiVA and WIOD data once data availability expands both in terms of country coverage (which is foreseen for the near future) and higher levels of disaggregation.

too weak an indicator to draw any wider conclusions about improvements in overall working conditions (such as hours of work, freedom of association, safety at work, etc.). Unfortunately sector-level data on working conditions and labor standards are generally not available in an internationally comparable manner. The data required for the two indicators we adopt, however, are more widely available and hence allow for cross-country comparisons. An important caveat which needs to be emphasized is that these data typically do not cover the informal sector and do not sufficiently account for irregular employment like temporary or contractual work (where working conditions and pay are usually worse than in regular jobs). Given this lack of reliable data on irregular employment, we do not know whether social upgrading/downgrading is accompanied by a rise or fall of precarious jobs. As a result, they exclude a large segment of workers, particularly in developing countries.⁶

3.3 GVC selection and country samples

The parsimonious approach outlined above is used to analyze the upgrading dynamics in four manufacturing GVCs: apparel, wood furniture, automotive, and mobile phones. This selection was made in order to cover a spectrum of GVCs with different degrees of technological sophistication, ranging from what are usually considered low-tech (apparel, wood furniture) to mid-tech (automotive) and high-tech sectors (mobile phones). Additionally, it allows us to

⁶ Some additional notes of caution are warranted. First, data for the social upgrading analysis are taken mainly from UNIDO's INDSTAT database, which accounts for data from a sample of manufacturing firms only, and this sample includes only firms with five, ten or more (formally employed) employees. Since informal firms and firms with less than 10 workers account for (significantly) more than half of employment in many developing countries, generalizing our findings should be done with caution. Second, different data sources often use different schemes to categorize economic activities so that the definitions of sectors are not always entirely congruent between economic and social upgrading indicators. Third, official data typically make no distinction between employment related to production for GVCs and production for domestic demand. We therefore have to take general employment developments as a proxy for developments in export-related production related to participation in GVCs. This is an issue given that the indicators for economic upgrading are more narrowly based on export data. The same caveat also applies to the wage data. Fourth, for various countries and years, data are scarce or not available at all. This affects the calculation of growth rates, which do not always cover exactly the same time periods. As a result, inferences made here should be interpreted with some caution.

cover differing governance structures, as both buyer-driven (apparel, wood furniture) and producer-driven chains (automotive, mobile phones) (see Gereffi, 1994) are analyzed. Moreover, all four sectors have globalized rapidly in recent decades, experiencing dynamic cross-border trade and a relatively high degree of developing country participation. While these GVCs also involve non-manufacturing activities (including R&D, product design, logistics, branding and marketing), our analysis focuses on the manufacturing segment of these chains.⁷

In each of these GVCs, we analyze the 25 countries with the largest world market shares in 2012 to cover the most important supplier countries. However, in order to avoid a selection bias towards "winners" or "economic upgraders", we also added those countries that were among the top-25 world exporters in the year 2000 (but no longer in 2012). Finally, to ensure a certain regional balance, we added the most important supplier countries of each region that was not or under-represented. In total, this resulted in a sample size of around 35 countries for each GVC.

4. Upgrading dynamics in the four GVCs

This section provides an analysis of economic and social upgrading and downgrading dynamics over the last decade in the four GVCs of interest. We use the parsimonious approach specified in the previous section to plot countries' upgrading performance in 2x2 scatter charts (see Figures 1-8). Countries appearing in the upper-right quadrant of these scatter plots are deemed (economic or social) upgraders while those located in the lower-left quadrant are classified downgraders.

⁷ The Annex gives precise definitions of the four GVCs according to international data classification schemes.

For each GVC, we look at the group of countries in each quadrant of the economic upgrading graphs and discuss how these countries have been doing on the social front during the same period. This will allow us to identify interesting upgrading patterns but also to already shed some light on the relationship between economic and social upgrading (downgrading) in the individual GVCs.

4.1 Apparel GVC

In recent years, the geography of apparel manufacturing has changed and the supply of apparel products has become increasingly concentrated in a few countries and regions, those being mainly East, Southeast and South Asia.⁸ This trend was accelerated by the expiration of the Multi-Fibre Arrangement (MFA) in 2005, which had governed international garment trade since 1974, as well as by the global economic crisis that started in 2008 (Gereffi and Frederick, 2010; Lopez-Acevedo and Robertson, 2012).

This shift towards the East can also be seen in Figure 1, which shows countries that have gained world export market shares at the right-hand side of the vertical axis. Seven countries have managed to combine these market share gains with export unit value growth in excess of the world average and, thus, to economically upgrade between the years 2000 and 2012. This group is dominated by Asian countries (China, Bangladesh, Vietnam, Turkey) but, interestingly, also includes two advanced economies (Netherlands, Spain) besides Peru. Have these countries that have experienced economic upgrading also improved in terms of social outcomes? Figure 2 shows that five of these countries (all but Netherlands and Spain) were indeed able to increase both employment and real wages in the apparel sector, i.e. to socially

⁸ The observations on concentration trends in the different GVCs are based on export data from UNCOMTRADE. We measure it by looking at how the number of countries with a world export market share above 1% has changed between 2000 and 2012. A decline in this number indicates an increase in concentration.

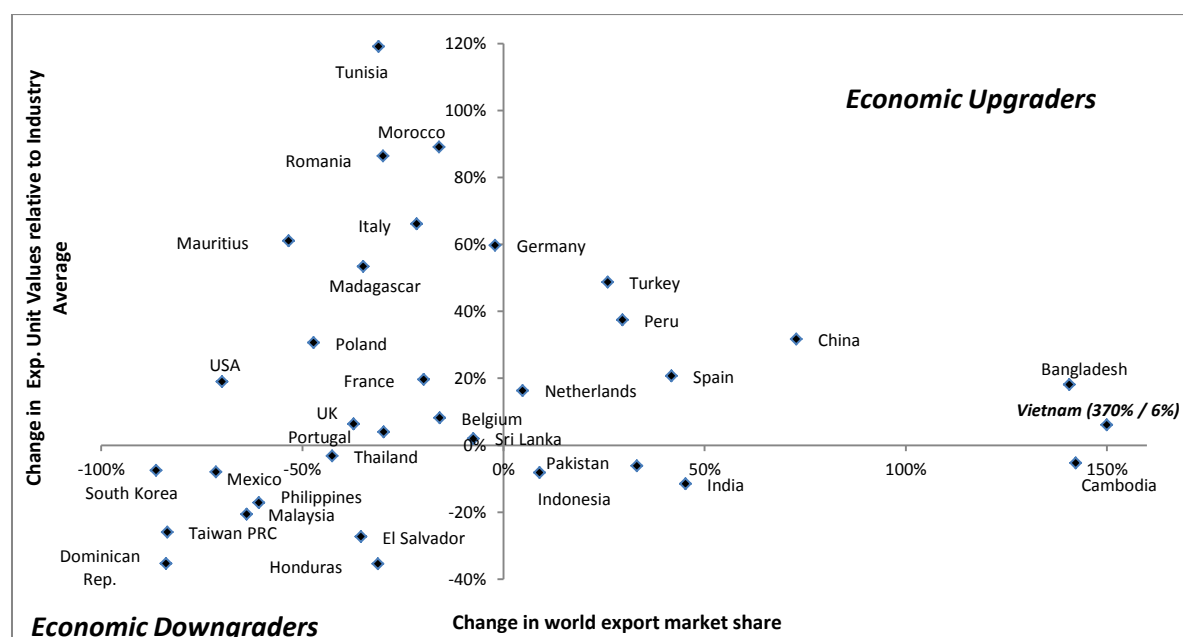
upgrade. The two European countries have had a reduction in jobs in the sector while increasing wages for those remaining, probably indicating improvements in productivity.

Four countries – all of them Asian economies – have increased their market shares while decreasing relative unit values. Two of them (India and Indonesia) experienced social upgrading (see Figure 2). The two other countries in this group (Cambodia and Pakistan) have seen an increase in apparel employment but a drop in real wages. This might indicate that they have gone down the *low road* to competitiveness whereby their participation in GVCs has allowed them to gain access to markets but without undergoing much economic upgrading. The social performance of India and Indonesia, on the other hand, might be an indication that they have achieved some degree of process upgrading with efficiency gains in production that helped to lower costs and improve competitiveness which then translated into favorable social outcomes. Case studies can help to clarify which trajectory a given country actually followed.

In contrast to the countries mentioned so far, 23 countries of our sample were unable to increase world market share in the apparel sector. 14 of them have had an increase in unit value with the decrease in market share, showing up in the upper-left quadrant of Figure 1. This group includes many high-income countries, along with all the African countries in our sample, as well as two Eastern European countries. While some of these countries may have been facing increasing costs or have become comparatively less efficient in production, therefore losing competitiveness in international markets, other countries may be focusing on high value products within the apparel sector, as they enter niche markets. When looking at Figure 2, we see that 10 of the 14 countries undergoing this trajectory have increased real wages while decreasing the number of people working in the sector. These are mainly the more developed countries of our sample, suggesting that this reflects a move out of apparel production as part of structural change processes.

Figure 1 reveals that nine countries actually experienced economic downgrading in the apparel GVC, those being Central American and Caribbean countries (Dominican Republic, El Salvador, Honduras, Mexico) as well as newly-industrializing economies and late industrializers in Asia (Malaysia, Philippines, South Korea, Taiwan Province of China (PRC), Thailand). While it may be the case that firms within these countries have simply not succeeded in upgrading their production, it is likely that some of these economies are undergoing structural change towards sectors of higher value addition, making the downgrading within the apparel sector not necessarily a negative experience for the economy as a whole. Among the nine economic downgraders, five have experienced increases in real wages and decreases in employment while there are also three cases of social downgrading.

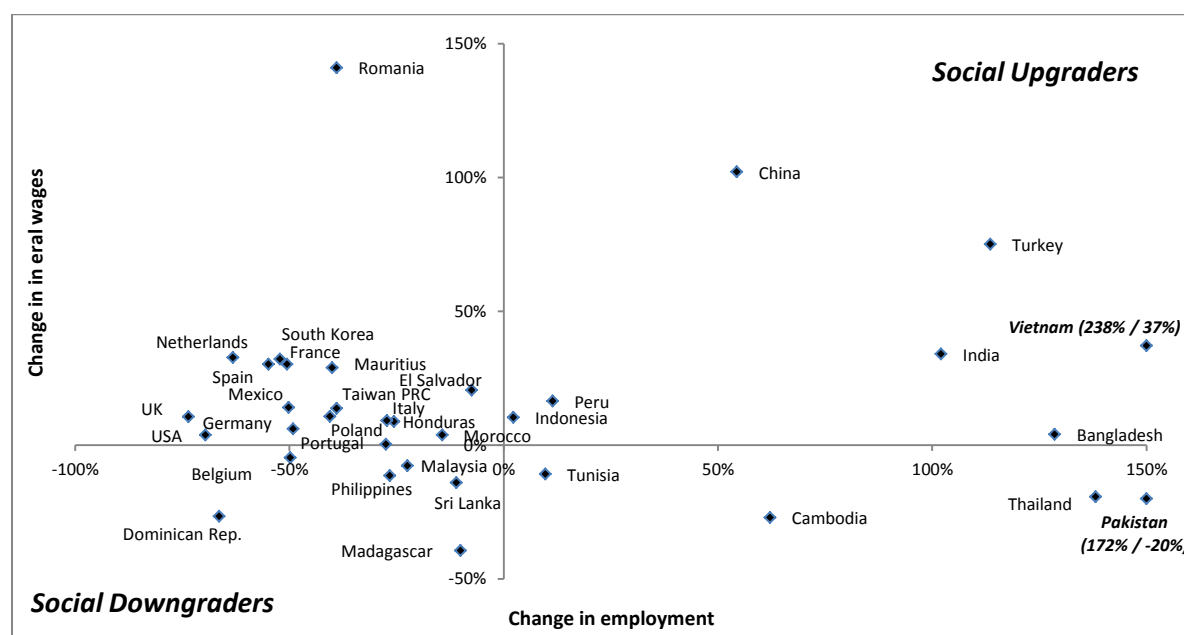
Figure 1: Economic Upgrading and Downgrading in the Apparel GVC (2000-2012)



Note: In all graphs, countries written in bold and italic letters are outliers which were relocated within the graph to enhance legibility with figures in parentheses being the actual values

Source: UNCOMTRADE database

Figure 2: Social Upgrading and Downgrading in the Apparel GVC (2000-2012)



Source: UNIDO INDSTAT4 and World Bank Global Economic Monitor (GEM) databases, Taiwanese Directorate-General of Budget, Accounting and Statistics (DGBAS), Institut National de la Statistique (INS) de Tunisie

Looking briefly at the relationship between economic and social performance in the apparel GVC we find that economic upgrading has more commonly gone hand in hand with social upgrading than without, and it is always associated with an increase in real wages for the (formal) workers. Furthermore, among the countries observed there are more cases of overall (i.e. a combination of both economic and social) upgrading than overall downgrading. However, the majority of the countries have not upgraded on either front.

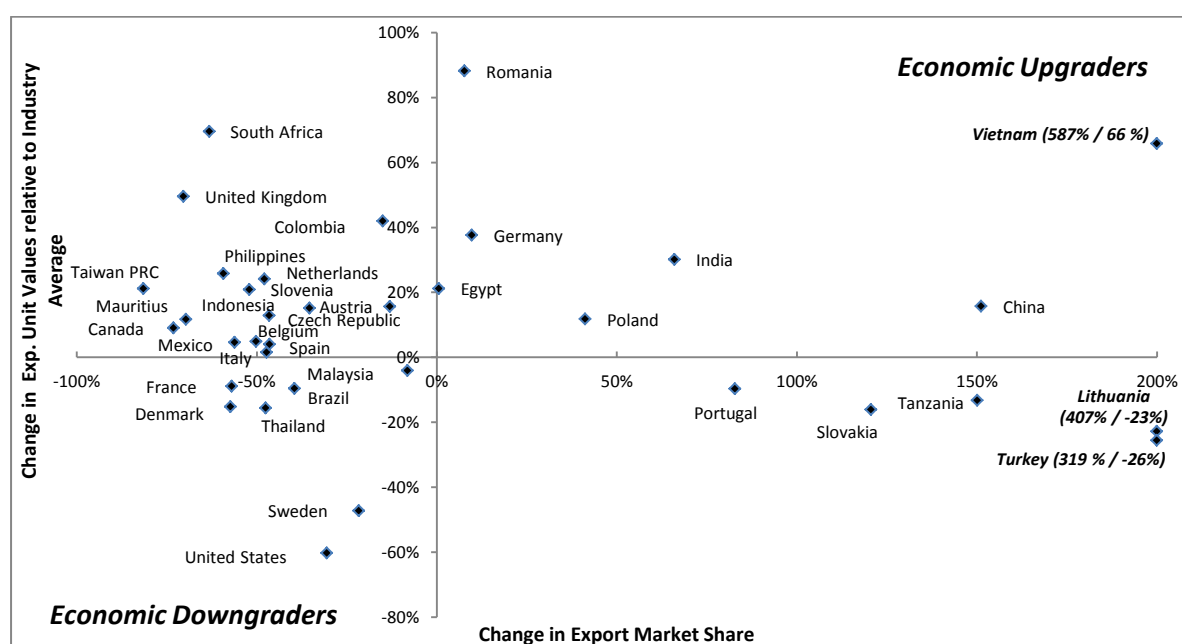
4.2 Wood furniture GVC

Similar to the apparel GVC, the global wood furniture sector has seen a certain degree of concentration in production throughout the past decade as well as a shift from Western Europe and North America eastwards, particularly to China (see also Kaplinsky and

Readman, 2005), which increased its world market share from 14% to 33% between 2000 and 2012.

When looking at Figure 3 we notice that seven of the 35 countries in the sample (a fifth) have undergone economic upgrading in the wood furniture sector, therefore having succeeded in moving along the *high road* of integrating into the wood furniture GVC. All these cases are emerging economies with the exception of Germany. Roughly half of them (four of the seven), namely all the Asian economies of this group and Poland, have also enjoyed social upgrading (with increases in both real wages and employment; see Figure 4). The remaining three countries have had varying social performances.

Figure 3: Economic Upgrading and Downgrading in the Wood Furniture GVC (2000-2012)

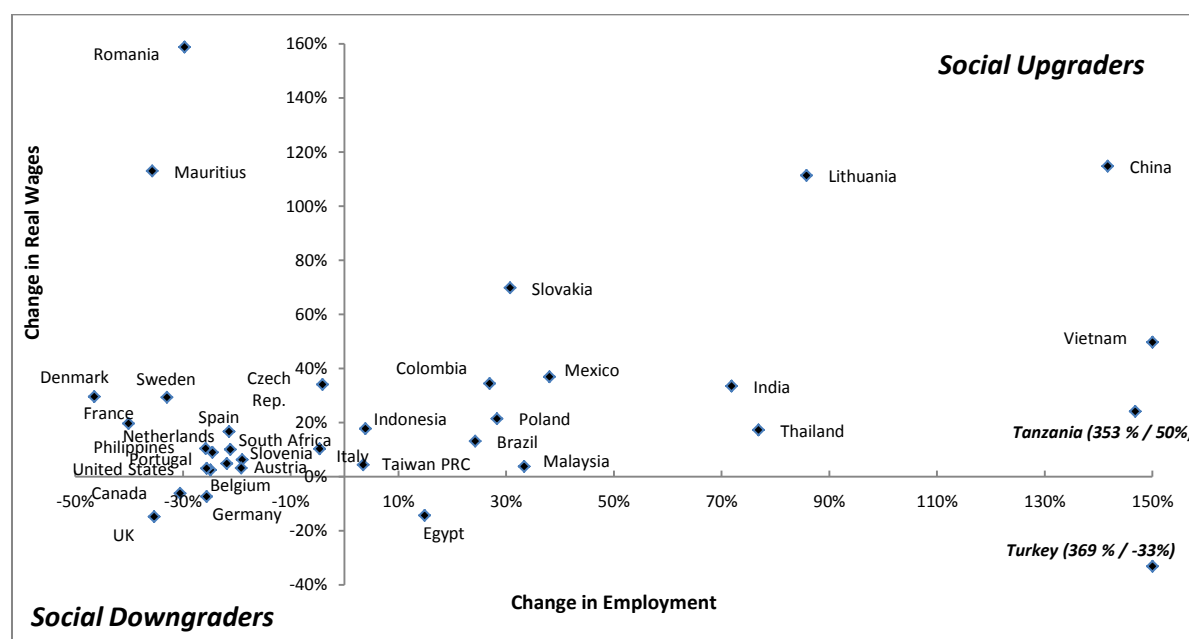


Source: UNCOMTRADE database

The lower-right quadrant of Figure 3 shows that five countries have increased market share and decreased relative unit values in the wood furniture GVC. This possibly reflects

achievements in terms of process upgrading, which may indeed have been the case in the three countries that at the same time have experienced social upgrading (Lithuania, Slovakia, Tanzania). In Turkey, by contrast, employment increased while wages decreased, suggesting it went down the *low road* to competitiveness.

Figure 4: Social Upgrading and Downgrading in the Wood Furniture GVC (2000-2012)



Source: UNIDO INDSTAT4, UNIDO INDSTAT2 and World Bank GEM databases

Just like in the apparel GVC, the majority of countries went through an economic trajectory whereby they have increased unit values relative to world average while losing world market shares (16 countries; see Figure 3). The countries within this group are either developed or industrializing nations. Half of these countries (the majority of them developed countries) have seen real wage increases with a contraction of employment opportunities in the sector (see Figure 4). This again, can be an indication of specialization within the GVC on the export of products that are of higher value, rather than failed upgrading. Five other countries in this

group, rather unexpectedly, have experienced social upgrading (despite world market share losses) while the remaining three were social downgraders.

As Figure 3 shows, there were as many economic downgraders as there were economic upgraders in the wood furniture GVC, namely seven, of which four are developed economies. All four developed economies saw employment decrease and real wages increase. The remaining three economic downgraders (Brazil, Malaysia, Thailand), surprisingly, managed to upgrade socially.

To sum up, in our sample there are four cases of overall upgrading (China, India, Vietnam and Poland) where economic upgrading and social upgrading occurred side-by-side, while there are no overall downgraders. More surprising, however, is that there are twice as many countries that have managed to upgrade socially (all being developing countries) than upgrade economically in the wood furniture GVC. While none of the social upgraders were developed countries, Germany is the only developed economy that has managed to economically upgrade. More generally, there seems to be less correlation between economic and social upgrading in the wood furniture GVC than in the apparel GVC examined above.

4.3 Automotive GVC

The automotive GVC is the only sector within our analysis where we did not see concentration and where the industry expanded across more countries. In particular, developing countries and emerging markets were able to enhance their importance as producers and suppliers in the automotive GVC. These geographical shifts have been motivated not only by lower operating costs in these countries and their proximity to (high-income) end markets but increasingly also by the intention to conquer the dynamic domestic markets of large emerging economies (Sturgeon and Van Biesebrock, 2011). However, whilst

we are seeing increasing participation of developing countries in this GVC, the geography of production and trade is still dominated by (lead) firms from advanced economies in North America (USA, Canada), Asia (Japan), and Europe (Germany, France, UK, Spain, Italy). At the same time, the recent global economic crisis has accelerated pre-crisis trends of shifts in the geography of automotive production towards the developing world so that the future might see a dwindling of Northern countries' predominance (Sturgeon et al, 2009).

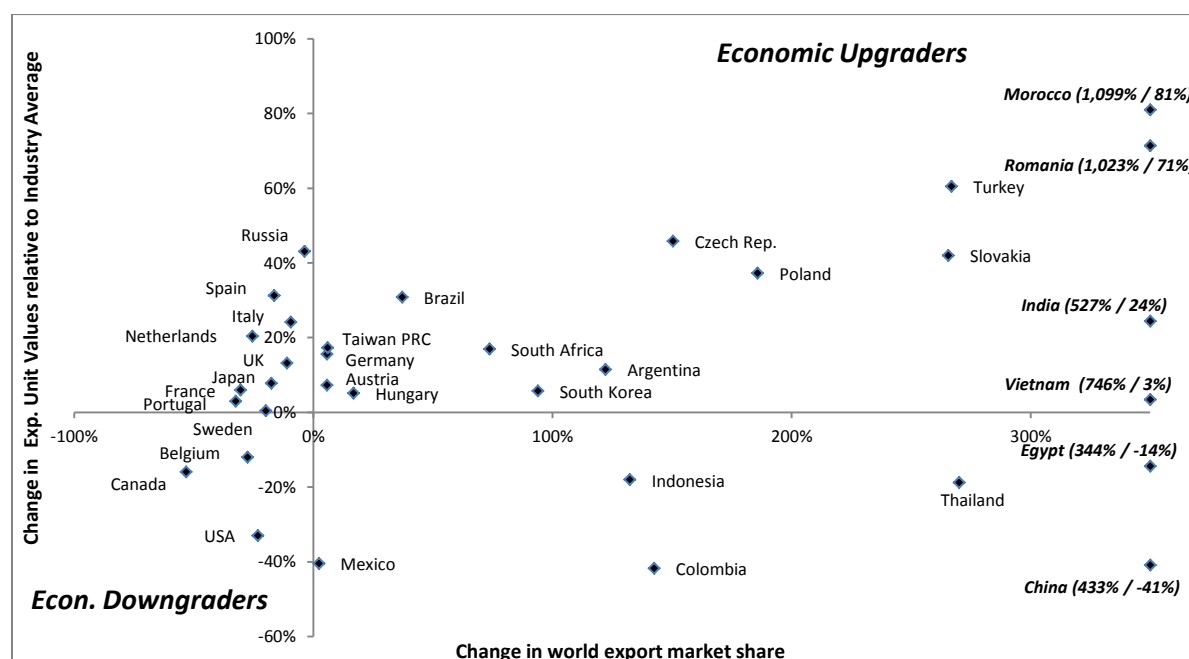
Indeed, all advanced economies in our sample except Austria and Germany lost world market shares. In fact, all the twelve countries in our sample that lost world market shares are developed economies. Nine of these still increased relative unit values of their automotive exports (see upper-left quadrant in Figure 5) which might reflect losses in competitiveness but is equally likely to reflect processes of structural change whereby lower-value manufacturing activities are offshored while specialization in higher-value automotive exports increases. Among these nine countries with increased relative unit values and market share losses, five saw employment losses but real wage increases (again, supporting the positive structural change argument), two were social downgraders while the remaining two increased employment but reduced real wages (see Figure 6).

Examining economic upgrading trends more specifically, we find in Figure 5 that almost half of the countries in our sample (16 out of 34) qualify as economic upgraders. Eleven of these (practically two thirds) were also social upgraders, implying that they have embarked on a *high road* to integrating into the automotive GVC. Such cases where economic and social upgrading took place simultaneously were found across the globe with no clear domination of any region, and for countries at different stages of development (developed, emerging or developing). The relationship between economic and social upgrading therefore seems very strong in the automotive GVC, significantly stronger than in the other GVCs.

Meanwhile, six countries gained world market shares but experienced a decrease in relative export unit values (see lower-right quadrant in Figure 5), including Latin American and Asian countries as well as Egypt. While half of them were social upgraders, the other half was only able to increase employment and had a reduction in real wages. The latter can be expected for countries that follow the *low road* as they need to squeeze prices to stay competitive.

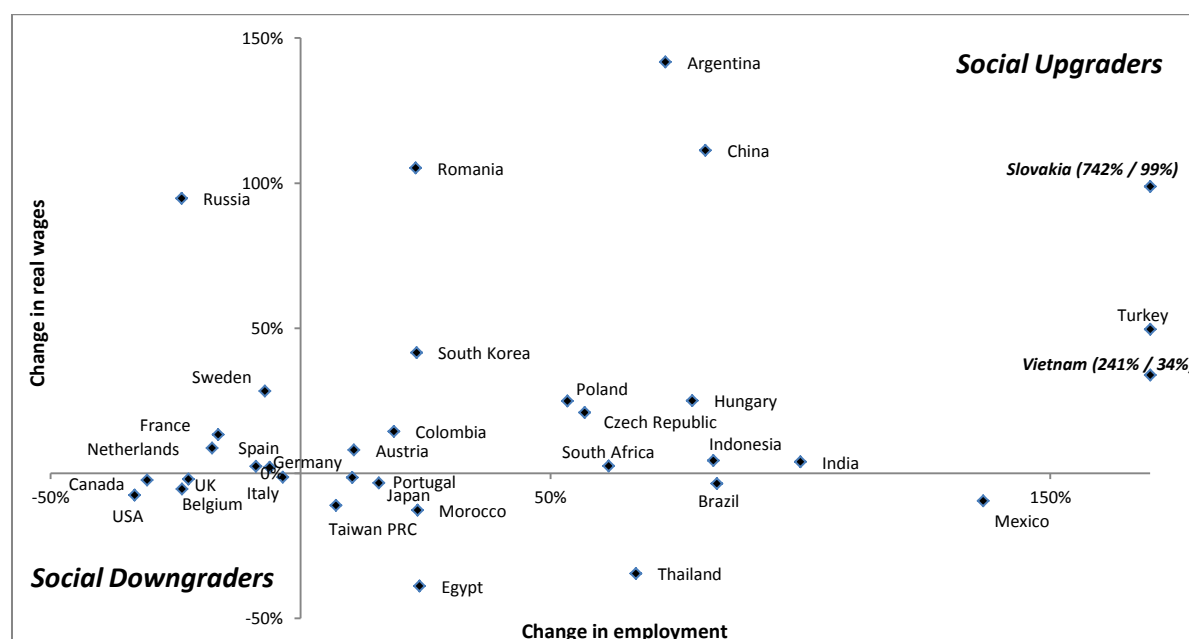
Three countries were economic downgraders, these being Belgium, Canada and the USA. All three also experienced social downgrading in the automotive GVC. This is another indication that economic and social performance are quite strongly related in this GVC – which is again reinforced by the fact that the automotive GVC had the most cases of overall upgrading (the combination of economic and social upgrading) among all four GVCs examined.

Figure 5: Economic Upgrading and Downgrading in the Automotive GVC (2000-2012)



Source: UNCOMTRADE database

Figure 6: Social Upgrading and Downgrading in the Automotive GVC (2000-2012)



Source: UNIDO INDSTAT4 and World Bank GEM databases, Ministerio de Trabajo, Empleo y Seguridad Social (Argentina), Institutul National de Statistica (Romania), Taiwanese DGBAS.

4.4 Mobile phones GVC

Similar to the two low-tech sectors in our sample, the mobile phone manufacturing GVC has also witnessed a slight consolidation in the number of dominant producer countries. Simultaneously, there has been an increase in participation of developing economies, particularly from Asia and Eastern Europe. This simultaneous consolidation and shift eastwards was also previously observed by Lee and Gereffi (2013). The role of China deserves particular attention. While in 2000 Germany had the largest world market share in this GVC with 12%, by 2012 China's exports in the mobile phone GVC accounted for more than 50% of the world's. This has naturally had implications on the world market shares of other economies.

Still, eight countries have managed to economically upgrade in the mobile phones GVC, amongst them only one developed country, Austria (see Figure 7). Six of these were also social upgraders. The two exceptions, Austria and Mexico, have seen rising real wages and declining employment (see Figure 8).

Another eight countries (half of them European countries) have gained world market shares but not increased unit values relative to world average. These countries have had varying experiences in terms of social outcomes. Four of them were social upgraders while in the Netherlands the mobile phones sector shed employment but saw increasing real wages (see Figure 8), possibly indicating achievements in process upgrading in these four countries. In the three remaining countries in this group employment increased while real wages went down, suggesting they have followed a *low road* trajectory.

By contrast, seventeen countries in our sample have lost world export market shares. In nine of them this happened alongside an increase in relative export unit values; apart from the Philippines and Estonia, they were all developed countries (see Figure 7). The vast majority of these countries (with the exception of the Philippines) have had increases in real wages with job cuts (see Figure 8). This is in line with the idea that these countries are increasingly concentrating in the higher-value and less labor-intensive segments of the mobile phones GVC.

Finally, there are eight cases of economic downgrading, and they spread across different geographic locations. From this group, only South Africa and Spain have also experienced social downgrading. The remaining six economic downgraders have gone through quite interesting social performance trajectories: In four of them, the mobile phones sector shed workers at the same time that real wages increased, whereas in the other two countries employment increased but real wages fell.

Economic Upgraders

Econ. Downgraders

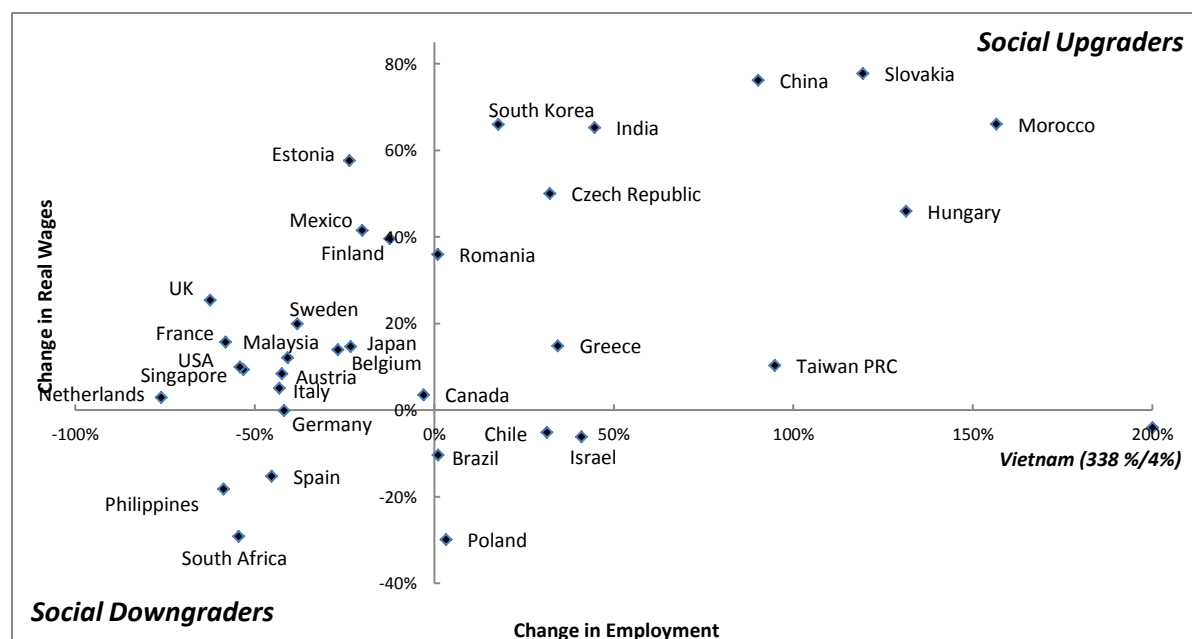
Change in Exp. Unit Values relative to Industry Average

Change in Export Market Share

Legend: ◆ Morocco

Country	Change in Export Market Share (%)	Change in Exp. Unit Values relative to Industry Average (%)
Estonia	-150	200
Mexico	100	130
Romania	1200	100
Taiwan PRC	950	50
Czech Republic	800	30
Austria	200	30
Italy	150	20
South Korea	100	20
Hungary	450	10
Philippines	-100	60
Canada	-150	50
Finland	-100	40
Germany	-100	20
UK	-100	10
France	-50	10
Japan	-100	0
Israel	-150	-10
Belgium	-100	-20
Spain	-50	-20
South Africa	-100	-30
Sweden	-100	-40
USA	-100	-50
Malaysia	-50	0
Greece	100	-10
Singapore	150	-10
Netherlands	100	-30
Chile	350	-30
China	850	-30
India	1100	-40
Vietnam	1150	-40
Slovakia	1200	-50
Poland	1050	-50

Figure 8: Social Upgrading and Downgrading in the Mobile Phones GVC (2000-2012)



All in all, social upgrading has been slightly more common in the mobile phones GVC than economic upgrading. Interestingly, there was only one developed country that was able to

upgrade in any form, that being Austria which managed to economically upgrade. Meanwhile, six countries have experienced overall upgrading and two countries overall downgrading.

5. Comparative analysis across the four GVCs

While in the above section we allowed ourselves to go into a deeper discussion of economic and social upgrading trajectories of the different countries we sampled for each GVC individually, we are now interested in bringing the wealth of information presented above together to, on the one hand, compare the results found for the different GVCs and, on the other hand, to point towards any interesting overarching findings. In order to facilitate comparisons, we convert the information of the 2x2 scatter plots presented in the previous section into 3x3 matrices – a prototype of which is depicted in Table 1 – to provide an overview of countries' trajectories within each GVC.

Table 1: Prototype Matrix for Mapping Economic and Social Up/Downgrading Dynamics

		Economic		
		Downgrading	Intermediate Case	Upgrading
Social	Upgrading	<i>Social Upgrading with Econ. Downgrading</i>	<i>Social Upgrading without Econ. Upgrading</i>	"Overall Upgrading"
	Intermed. Case	Economic downgrading without Social Upgrading	Lack of Upgrading	<i>Econ. Upgrading without Social Upgrading</i>
	Downgrading	"Overall Downgrading"	Social Downgrading without Economic Upgrading	<i>Econ. Upgrading with Social Downgrading</i>

Each country's economic performance is displayed on the horizontal axis while its social performance is plotted on the vertical axis. This allows grouping countries into different performance clusters with the following interpretations: The countries in the top right-hand cell are "overall upgraders" (combining economic upgrading with social upgrading), while countries in the bottom left-hand cell are "overall downgraders" (combining economic downgrading with social downgrading). Countries appearing in the two left-hand cells of the top row have experienced social upgrading without economic upgrading, whereas countries located in the two lower cells of the right column are economic upgraders without social upgrading. Finally, countries reported in the four cells in the lower left-hand corner are cases of "lack of upgrading" in the sense that they did not experience upgrading on either front (social or economic). The following cross-GVC analysis compares, firstly, economic trajectories, secondly, social trajectories and, finally, the relationship between the two.

Table 2: Economic and Social Up/Downgrading in the Apparel GVC

		Economic		
		Downgrading	Intermediate Cases	Upgrading
Social	Upgrading		India, Indonesia	Bangladesh, China, Peru, Turkey, Vietnam
	Intermediate Cases	El Salvador, Honduras, Mexico, South Korea, Taiwan PRC, Thailand	Cambodia, France, Germany, Italy, Mauritius, Morocco, Pakistan, Poland, Portugal, Romania, Tunisia, UK, USA	Netherlands, Spain
	Downgrading	Dominican Rep., Malaysia, Philippines	Belgium, Madagascar, Sri Lanka	

Table 3: Economic and Social Up/Downgrading in the Wood Furniture GVC

		Economic		
		Downgrading	Intermediate Cases	Upgrading
Social	Upgrading	Brazil, Malaysia, Thailand	Colombia, Indonesia, Lithuania, Mexico, Slovakia, Taiwan PRC, Tanzania	China, India, Poland, Vietnam
	Intermediate Cases	Denmark, France, Sweden, USA	Austria, Belgium, Czech Republic, Italy, Mauritius, Netherlands, Philippines, Portugal, Slovenia, South Africa, Spain, Turkey	Egypt, Romania
	Downgrading		Canada, UK	Germany

Table 4: Economic and Social Up/Downgrading in the Automotive GVC

		Economic		
		Downgrading	Intermediate Cases	Upgrading
Social	Upgrading		China, Colombia, Indonesia	Argentina, Austria, Czech Rep., Hungary, India, Poland, Romania, Slovakia, South Africa, S. Korea, Turkey, Vietnam
	Intermediate Cases		Egypt, France, Mexico, Japan, Netherlands, Portugal, Russia, Spain, Sweden, Thailand	Brazil, Germany, Morocco, Taiwan PRC
	Downgrading	Belgium, Canada, USA	Italy, UK	

Table 5: Economic and Social Up/Downgrading in the Mobile Phone GVC

		Economic		
		Downgrading	Intermediate Cases	Upgrading
Social	Upgrading		China, Greece, India, Slovakia	Czech Republic, Hungary, Morocco, Republic of Korea, Romania, Taiwan PRC
	Intermediate Cases	Belgium, Brazil, Israel, Malaysia, Sweden, United States	Canada, Chile, Estonia, Finland, France, Italy, Japan, Netherlands, Poland, Singapore, United Kingdom, Vietnam	Austria, Mexico
	Downgrading	South Africa, Spain	Germany, Philippines	

5.1 Economic upgrading

Our parsimonious approach to economic upgrading reveals considerable variation across the four GVCs. Interestingly, among our sample countries, economic upgrading has been more common in complex sectors with a higher degree of technological sophistication (where GVCs are mostly producer-driven) than in sectors with lower technology intensity (mainly buyer-driven). While the apparel and the wood furniture GVCs each had seven economic upgraders, the automotive and mobile phones sectors had eight and sixteen, respectively.

This shows that economic upgrading is not as easily achieved as suggested by the case study literature, which often focuses on success stories (Milberg and Winkler, 2011). As the flipside of the pattern described above, among our sample countries, economic downgrading has been more common in low-tech than in higher-tech sectors.

Overall, advanced economies are less likely to undergo economic upgrading than developing economies. In most cases, this was due to their loss of world market shares to dynamic emerging market economies, which are gaining importance as producers and exporters.

This loss in world market shares, particularly in low-tech sectors, is commonly accompanied by a rise in export unit values for these countries. This can, in principle, reflect a loss of cost competitiveness or, conversely, a shift in the composition of their export baskets towards higher-value products. The latter would reflect processes of structural change in the economic configuration of these countries.

Conversely, there are quite a number of supplier countries in the developing world that have gained market shares but which have not managed to increase the relative value of the products they export. This could either reflect process upgrading or a *low road* trajectory, as costs are cut.

5.2 Social upgrading

As with economic upgrading, patterns of social upgrading vary quite a bit across GVCs. Social achievements have been far more widespread in the wood furniture and automotive GVCs (with 14 cases of upgrading in each) as well as in the mobile phone manufacturing (ten social upgraders). Social upgrading has been most tenuous in the apparel sector and was achieved by only seven countries in our sample.

It seems that workers are under particular pressure in the apparel sector where production is labor-intensive. This is confirmed by the fact that social downgrading has been most common in the apparel GVC with six cases of downgrading. Interestingly, however, the number of social downgraders among our sample countries was lower than the number of social upgraders in every value chain.

More generally, with the exception of automotives, job cuts have been very common across GVCs, as have been real wage increases. This combination of job losses and wage increases has been particularly pronounced in developed countries, which may reflect structural transformation processes in these economies.

Compared to the economic realm, it seems that upgrading has been more widespread in the social sphere while, conversely, downgrading has been more common in the economic domain. In fact, with the exception of the automotive GVC, the number of social upgraders exceeded the number of economic upgraders, and the number of economic downgraders exceeded the number of social downgraders in all the GVCs analyzed here.

5.3 Overall upgrading

Looking at Tables 2-5, we find that across our GVCs overall upgrading is more common than overall downgrading. This is true for every single GVC in our sample. While there were 26 cases of overall upgrading across the four GVCs, there were only eight cases of countries that downgraded both in economic and social terms.

Developed countries were more often able to go through economic upgrading (eight cases) than through social upgrading (two cases), while developing countries had the opposite experience, where they enjoyed more social upgrading (43 cases) than economic upgrading (32 cases).

What do the tables tell us about the relationship between economic and social change? Are economic and social upgrading taking place in parallel? The cells in the diagonal from the bottom-left to the top-right include those countries where the social performance corresponds to the economic performance. By contrast, for countries that appear in the off-diagonal cells we can observe that economic and social performance did not concur. Looking at the diagonal cells of Tables 2-5 and counting all GVCs together, we find that in more than half of the countries the direction of economic and social change is the same. In the automotive GVC the relationship is strongest, while in the wood furniture GVC the relationship is weakest.

Across the four value chains, there is no case of economic upgrading with outright social downgrading, with the single exception of Germany in the wood furniture sector. Moreover, in each GVC, there are only a few (between two to five) cases of economic upgrading without social upgrading, with the highest number in the automotive sector. At the same time, there are very few countries that have achieved social upgrading without economic upgrading (except in the wood furniture sector). In all four GVCs, the number of overall upgraders exceeds both the number of countries that have undergone economic upgrading without social

upgrading as well as the number of countries that have experienced social upgrading without economic upgrading (with the exception of the wood furniture sector).

Looking for regional trends, we find that the majority of overall upgraders across the four GVCs are Asian or Eastern European while there are also some cases of countries from the MENA⁹ region and Latin America. As previously mentioned, there is only one case (Austria) of a developed country with overall upgrading. Similar to the experience of many developed countries in our samples, some newly industrialized economies such as South Korea or Taiwan PRC have been overall or at least economic upgraders in the two higher-technology sectors (automotive and mobile phones), while losing competitiveness in the sectors with lower technological sophistication. These countries seem to experience structural change within the manufacturing sector. By contrast, for China but also Vietnam, we observe that they undergo rapid and broad-based industrialization. They remain competitive and overall upgraders in the two low-tech sectors (apparel and wood furniture), and Vietnam even in the mid-tech sector (automotive), while failing to have overall upgrading in the high-tech sector, due to the lack of economic upgrading.

6. Conclusions and critical remarks

Applying a parsimonious approach to measuring economic and social upgrading in four manufacturing GVCs we find that, while a number of countries do experience economic upgrading, the promise of industrial upgrading through participation in GVCs does not materialize for everyone. Indeed, we find that just over a quarter of the cases in our sample have experienced economic upgrading. Overall upgrading, i.e., the concurrence of both economic upgrading and social upgrading, has therefore been rather scarce in our sample.

⁹ Middle East and Northern Africa

However, our analysis reveals that in those cases where economic upgrading does take place, it is indeed more likely to be accompanied by social upgrading than not, which indicates some positive relationship between the two.

Yet, it is important to emphasize that patterns differ across GVCs. The relationship between economic and social upgrading seems to be strongest in the automotive value chain. This is largely due to the fact that this GVC has both the largest number of economic upgraders and of social upgraders. It also has the largest number of overall upgraders. The apparel GVC, on the other hand, has seen most economic downgrading, though in many cases this was not accompanied with social downgrading. A similar pattern is observed in the mobile phone GVC. The chain where the relationship between economic and social upgrading seems weakest is the wood furniture industry, with 19 cases where economic and social developments have not gone hand in hand. This, however, is mostly due to the fact that many countries experienced social upgrading without economic upgrading, and therefore hints towards the fact that social performance can, and is, determined by factors other than the country's economic upgrading performance.

The bulk of countries in our sample did not experience clear-cut upgrading or downgrading. For example, quite a number of developing countries recorded increasing world market shares with decreasing unit values relative to industry averages. This can be the result of successful process upgrading and productivity gains. In some cases, however, this can also be the result of lead firms exercising pressure on suppliers to maintain low prices, forcing the suppliers onto a *low road* so that they struggle to upgrade. Looking at country's social performance helped to identify which of these trajectories was more likely to apply. Meanwhile, many developed economies experienced increased unit values with market share losses, and

similarly employment decreases with wage increases, possibly reflecting processes of structural change in the configuration of their economies.

The observed patterns are likely to have been shaped by factors highlighted in the GVC literature such as the governance structure of the GVC concerned, domestic upgrading efforts, public policies, national and international regulations, firm ownership structures as well as the entry point and stage of GVC integration. However, similar patterns of upgrading or downgrading can have different underlying mechanisms. Therefore, while our paper presents upgrading trends, both across GVCs as well as for a range of countries within GVCs, case study literature is needed to shed light on more specific information hiding beneath our data.

Our concept of “overall upgrading” can serve as a starting point for a more holistic theory of upgrading that integrates economic, social and ideally even environmental aspects of GVC participation. Such a theory would reflect on the underlying mechanisms that drive the relationship between economic and social outcomes, accounting for possible trade-offs, thereby helping to improve our understanding of the conditions which typically lead to either overall favorable outcomes (a “virtuous upgrading circle”) or unfavorable outcomes (a “vicious downgrading circle”). From our analysis we know that positive developments in one area are not always accompanied by positive developments in the other domain.

However, some caveats have to be borne in mind when interpreting our findings. First, while our parsimonious approach to defining and measuring upgrading allowed comparisons across countries, regions and GVCs, by definition it does not take into account various aspects resulting from upgrading. Most importantly, the indicators we use are not able to capture qualitative facets of social upgrading, such as the compliance with labor standards or other improvements in working conditions. Nonetheless, cases such as the deadly collapse of the Rana Plaza building in Bangladesh housing clothing factories, the recent violent protest

requesting higher minimum wages in Cambodia and the alerting number of suicides in China's Foxconn are just a few examples of precarious working conditions which need to be discussed as part of the reality of the increasing international fragmentation and therefore competition in production.

Moreover, the official data we use do not cover the informal firms or workers – which in many developing countries accounts for around 70% or more of the labor force¹⁰ – where entitlements and social benefits are typically non-existent and labor laws not enforced. Also, the data do not sufficiently account for irregular employment arrangements like temporary or contractual work where wages and social security benefits are usually worse and job insecurity much higher than in regular jobs. Due to this lack of data, it is unfortunately not possible to include such analysis into our work at this stage.

Second, the approach and terminology used here might seem to suggest that upgrading is always desirable in any given GVC. However certain sectors or chains offer little prospects for learning, productivity increases or technological progress and, thus, are less promising with regard to longer-term economic development. If developing countries focus their upgrading efforts on these chains and allocate an increasing amount of resources to these sectors, they risk being trapped in a *low road* trajectory to development (Milberg and Houston, 2005). Lack of economic upgrading (or even downgrading) in a given GVC as measured by the indicators adopted here, therefore, can be a positive thing if it is a side effect or manifestation of the structural change an economy is undergoing.

Future research might add precision and rigor to the analysis of economic and social upgrading by using information on working conditions as well as data on trade in value-added and world input-output data, once such data becomes available at a more disaggregated

¹⁰ See ILO KILM database: <http://kilm.ilo.org/KILMnet/>

sectoral level and for a wider range of countries (Ahmad, 2013). Another issue that deserves heightened attention in future research is the impact of integrating and upgrading in GVCs on inequality – both within and across countries. For quite a number of countries in our sample, we observed a decline in sectoral employment coupled with a rise in real wages – is this an indication of increasing inequality?. Finally, while initial efforts have been undertaken (Staritz et al, 2011), future research should aim at improving our understanding about how and to what extent the observed regionalization of value chains fosters or hinders both economic and social upgrading in developing countries.

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Annex A: Definition of GVCs

Indicator	World export market share and Export unit value	Employment and nominal wages
Apparel	HS chapters 61 + 62	ISIC code 1810 (or ISIC code 18)
Wood furniture	HS codes 940161 + 940169 + 940330 + 940340 + 940350 + 940360	ISIC 3610
Automotive	SITC codes 69915 + 71311 + 71321 + 71322 + 71323 + 71391 + 71392 + 76211 + 76212 + 77313 + 77812 + 77823 + 77831 + 77833 + 77834 + 7812 + 7821 + 7822 + 7831 + 7832 + 7841 + 78421 + 78425 + 78431 + 78432 + 78433 + 78434 + 78435 + 78436 + 78439 + 78511 + 78513 + 78515 + 78516 + 78517 + 78519 + 78535 + 78689 + 82112 + 88571	ISIC codes 3410, 3420 and 3430 (or ISIC code 34)
Mobile phones manufacturing	HS code 852520	ISIC codes 3220 and 3230