

# **Productive Fragmentation and Less-skilled Labor in Developing Countries: channels of influence and empirical evidence**

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## **ABSTRACT**

This paper analyzes the theoretical and empirical literature about the effects of productive fragmentation on less-skilled workers' incomes and jobs. We explore what are the channels of influence of productive fragmentation on the less-skilled labor share of employment and income in developing countries in a theoretical level and the empirical evidences for these channels. The empirical evidence discussed, in general, falsifies what is predicted by the Stolper-Samuelson theorem that greater international integration would lead to increased relative demand for less skilled labor and its relative wage in developing countries.

**KEYWORDS:** Global Value Chains; Labor Markets; Income Distribution.

## **1. Introduction**

Income inequality, together with poverty and unemployment, are still primary concerns of the developing world. Inequality among countries, measured by the Gini Index, showed a convergence trend in the decades of 1990s and 2000s (Chambers and Dhongde, 2016). While these countries became more similar, they also became, on average, more unequal (Alvaredo and Gasparini, 2015). Chambers and Dhongde attribute the observed convergence to the concomitant convergence in the economic policy adopted in these countries during the 1990s. During the period, there was an intense commercial and financial liberalization, privatization and technology transfer to developing countries which also characterized a period of increasing globalization.

International trade theory, largely based on Heckscher-Ohlin (HO) model, predicted that the commercial openness would favor the less-skilled workers in developing countries, reducing unemployment, inequality and poverty. However, increasing inequality in the 1990s both in advanced and developing economies challenged the HO conclusions – as shown in the review of empirical works made by Harrison et. al. (2011). Even in China, a benchmark for economically benefiting from international trade, global economic integration has been positively associated to income inequality. Mah (2013) finds evidence that, between 1985 and 2007 in China, commercial liberalization had a strong and positive effect in inequality measured both as the ratio of the income share of the first to the tenth decil and as the average income of the first decil divided by the average income of the four lowest deciles. Kanbur and Zhang's (2005) find similar evidence based on estimations for the 1979–2000 period. Similar results are also found for other developing countries. Kratou and Goaid (2016), using panel data for 66 developing countries from 1984 to 2005, find evidence that international trade increased income inequality in these countries. According to their estimations, commercial openness reduced the income shares of the lowest deciles and raised the income shares of the two richer deciles. The effect over the lowest deciles was differentiated according to the country's per capita income: the poorer individuals in

higher per capita income countries benefited from commercial openness, although less than their richer fellow countrymen.

Since the predictions of the standard HO model were questioned by empirical studies, a variety of hypothesis has been explored to investigate the relation between global economic integration and inequality in developing countries. Among them are the effects of international trade in intermediate goods, (across border) productive fragmentation, outsourcing and the diffusion of Global Value Chains (GVCs). Technological advance allowed the reduction in transportation and communication costs which promoted geographical fragmentation of vertically integrated productive processes beyond national borders in global and local levels (Antonelli, 2011). In its traditional form, outsourcing involved the expansion of transnational corporations (TNC) through the creation of subsidiaries, but it also occurs in the form supply contracts between different firms (Medeiros and Trebat; 2017). There are a growing number of producers in developing countries engaged in supply contracts for a decreasing number of global buyers (Antonelli, 2011). According to UNCTAD's (2013) report, in 2013, 60% of international trade accounted for intermediary goods and services. One of the consequences of productive fragmentation is the fragmentation of the value-added embodied in a final good among different countries. In a broad study, including 555 productive chains, Los et. al. (2014) find that the proportion of foreign value added encompassed in final goods of manufacturing productive chains increased 20 percent between 1995 and 2008, on average. This trend is observed in all manufacturing productive chains, regardless of the country where the last stage of production is completed.

The integration of developing countries into these GVCs is considered an opportunity for economic development and catching up. Instead of building an entire manufacturing chain, developing countries can capture stages of production within these chains generating income and jobs (Baldwin, 2011). However, the GVC approach to international trade, in opposition to standard international trade theory, holds that the stages of production hosted by a country matter for its long-term economic performance (Milberg, Wrinkler, 2013). And yet, even when participation in GVCs boosts economic performance, theoretical and empirical studies have pointed to asymmetric and sometimes adverse effects of productive fragmentation on labor markets (Barrientos et. al., 2011; Gutelius, 2015). The less-skilled workers are often pointed as the least benefitted from this process. Thus, to understand the circumstances and channels through which productive fragmentation affect the poorer is one important step so that developing countries are able to conduct their international economic integration in favor of an inclusive economic growth.

Therefore, this paper aims to analyze the theoretical and empirical literature about the effects of productive fragmentation on less-skilled workers' incomes and jobs. We explore what are the channels of influence of productive fragmentation on the less-skilled labor share of employment and income in developing countries in a theoretical level and the empirical evidences for these channels. Productive fragmentation may influence the relative wages of less-skilled labor and the employment structure within each industry. Moreover, as the employment structure and labor shares of income varies among industries, productive fragmentation may influence the less-skilled labor employment and income share by changing each industry's value-added share in aggregate income which is given by a country sectoral specialization. In this sense, Section 2 presents a review of the theoretical and empirical literature that links productive fragmentation and sectoral specialization. Section 3 discusses the hypothesis and empirical studies about the effects of productive fragmentation on the employment structure within an industry. While Section 3 deals with the effects of productive fragmentation on less-skilled labor income.

## **2. Productive fragmentation, sectoral specialization and less-skilled labor share of wages and employment**

The most traditional approach to international trade follows the HO model. The HO is a derivation of Ricardo's comparative advantage theory which states that, in a free trade context between two countries, each country specializes in goods and services in which they have comparative advantage. The comparative advantage, in Ricardo, is measured as a cost advantage measured in differences of labor requirement to produce a given amount of output. The HO model considers that differences in factor endowments are the principal determinants of cost differences. Departing from the assumptions of homogeneous and constant returns to scale technology, homogenous preferences and perfect competition, the model predicates that commercial openness increases the relative price of the goods intensive in the factors relatively abundant in each country. Hence, there is a reallocation of production to these goods raising the relative demand for the factors used more intensively in their production. As developing countries are more abundant in less-skilled labor, relatively to developed countries, where skilled labor and capital are more abundant, the model predicts that free international trade contributes to a rise in the demand for less-skilled labor in the former countries (Wood, 1995).

The empirical studies covering the post liberalization period in developing countries show mixed evidence for the HO prediction of employment reallocation to industries more intensive in less-skilled labor. For example, Verhoogan (2004) observes a shift in relative output in Mexico during the 90s in favor of unskilled labor and low capital intensive sectors. Gonzaga et. al. (2006) notice that the employment shifted from skilled to unskilled sectors after liberalization in Brazil from 1988 to 1995. However, Meschi et. al. (2011) find that, during and after trade liberalization in Turkey from 1987 to 2001, labor reallocation had a minor effect on relative demand for unskilled labor in manufacturing industries and its direction was towards more skilled-labor intensive sectors. Revenga (1997) and Feliciano (2001) fail to find evidence for significant effects of trade liberalization on employment reallocation in Mexico, while Currie and Harrison (1997) find only a small impact of trade reform on output and employment in Morocco. Wacziarg and Wallack (2004) investigate the effect of 25 trade liberalization episodes on intersectoral employment reallocation in developing countries and their results suggest far smaller effects than predicted by standard trade theory.

In the post liberalization period in developing countries, a rise in the relative price of capital and skilled intensive industries and the shifts of output to these sectors is attributed by some authors to the pattern of previous trade protection and of tariffs' drops. Hanson and Harrison (1999) present evidence that trade protection in Mexico favored the sectors with a more intensive use of unskilled labor in 1984, prior to the 1985 trade reform. Currie and Harrison (1997) find the same pattern of protection in Morocco.

Another explanation for the shift in labor and output to more skill intensive sectors in developing countries is found in Davis and Mishra (2007) who argue that in the real-world comparative advantage cannot be fixed between all commercial partners. A country that is less-skilled labor abundant in global terms may also import unskilled intensive products. Factor abundance must be compared to that of countries producing the same sets of goods. Following this line of argument, commercial liberalization between countries that produce different sets of goods will cause only minor impacts on labor allocation. While increased competition among developing countries, which are unskilled labor abundant in global terms and produce similar goods, will decrease the unskilled labor relative demand in the least unskilled labor abundant country.

The theories of technological gap abdicate the assumption of homogeneous technology to show its implication to transnational market power (Posner, 1961). In this formulation, a country specialized in a new product will be a monopolist receiving rents until the product is imitated by the other countries. It follows that innovation capacity or innovation leadership can determine commercial specialization as the gap between leaders and followers may persist self-fed by technological externalities and to further investment in R&D supported by accumulated rents (Grossman and Helpman, 1991). The product cycle theory of Vernon (1966) also emphasizes the role of innovation capacity to the pattern of international trade. Vernon split the product cycle in three stages: the first is the introduction of the new product, when the uncertainty regarding the product profitability is compensated by potential monopoly rents; the second stage is when the product is accepted in the market and scale economies become more important to supply the new demand; the last stage is when the production process is standardized and becomes less skill intensive. In this last stage, the production is transferred to developing countries with lower labor costs and the workforce in developed countries are allocated to the development of new products.

The technological gap related theories predicates that developing countries will specialize in products and sectors that are less technological advanced which tend to be relatively intensive in less-skilled labor. But it occurs not because of the relative abundance of unskilled to skilled labor but because of the differentiated capacity to bring new products to the markets due lagged innovation capacity or access to consumer markets that prevents these countries to compete in the frontier of high technology products and sectors. Combining the technological gap theory with Davis and Mishra argument of differences in goods quality, increased global trade integration may increase international competition more intensively among the developing countries that produce similar low-tech products than between developing and developed countries from which products do not compete directly. This mechanism leads to lowering the value-added share of less-skilled intensive sectors and to the decrease in relative less-skilled labor employment in some developing countries.

New trade theory models with increasing returns to scale that introduce transportation costs and other barriers to trade encompass the role of the dimension and structure of domestic and regional demand to the pattern of trade specialization. In these models, increasing returns industries will tend to concentrate in regions with larger markets (Helpman and Krugman, 1985). Regional trade integration may lead to a deconcentration and further concentration of certain industries in a few geographical locations. In Puga and Venables' (1996) model, the first to relocate are the labor intensive industries which are more affected by increases in wages in the more industrialized countries. However, the development of labor intensive activities makes it profitable for labor un-intensive sectors to follow. On the other hand, developing countries have a larger proportion of low incomes families and consequently their demand structure is more concentrated in less-skilled labor intensive consumer goods and services. Hence, regional economic integration among developing countries contributes to further scale economies gains in less-skilled labor intensive sectors.

The previous models and hypothesis are focused on final goods trade, but trade in parts grew much faster in the 90s and 2000s. Feenstra and Hanson (2001) argue that trade in intermediate goods have a potentialized effect on employment, as it affects labor demand both in import competing firms and also in the firms that use the foreign input. It can shrink the production of domestic manufacturers of intermediate products. Also, as some firms opt to outsource some previously internalized stages of production, its value-added per unit of output may shrink. On the other hand, outsourcing may reduce production costs for domestic firms and increase their international competitiveness, leading to an increase in output and

employment (Kis-katos and Sparrow, 2015). Depending on the stage of production that is being externalized, value-added composition and employment structure can take a different direction. For example, Amiti and Cameron (2011) find evidence that in Indonesia from 1990 to 2001, intermediate goods were produced with more skilled labor intensive technologies and that tariff reduction over inputs reduced the relative demand for skilled labor. Fanjzylber e Fernandes (2009) argue that *“firms that use imported inputs are likely to concentrate more heavily in stages of the production process or in goods in which the country has a comparative advantage”*.

The GVC approach provides an alternative, and institutionally grounded, theory of international trade focused on trade in intermediate inputs. The common starting point in this literature is that the GVCs came to existence because they enabled higher profit gains for companies outsourcing some stages of production (Ravenhill, 2014). “Whether the driver is a producer or a buyer, the motivation for global production sharing is normally the search for reduced costs or increased flexibility” (Milberg, Winkler; 2013, p. 5). The division of labor within the GVCs is functional to the increase in incomes appropriated by transnational companies that are the leaders and coordinators of the process of productive fragmentation (Medeiros and Trebat, 2017). The host countries of these companies are, in large majority, the developed ones. They specialize in higher value-added activities such as product design and marketing, which receive monopoly rents, guaranteed by intellectual property rights and financial innovations. The suppliers of the host companies located in developing countries engage in lower value-added stages of production in which price competition prevails. These lower value-added stages are generally more less-skilled labor intensive.

Differently from the standard theories of international trade, in the GVC approach, trade specialization matters because it greatly determines who will capture the gains from trade. In this context, economic development is practically synonymous for the firms within the country to move to higher value added stages of production. “The notion of industrial upgrading is premised on a rejection of optimality of the given international division of labor based on comparative advantage” (Milberg, Wrinkler, 2013). Hence, structural change within GVCs depends on industrial policy and national strategies translated in trade and technological transfer agreements and R&D investments. The GVC literature also stresses the importance of the form governance of the value chain by the lead firms. Ravenhill (2014) argues that a well-known problem for suppliers in GVCs is that “even if they enhance their capabilities and produce more efficiently, the lead companies that control key dimensions of the value chain such as brand names, design or distribution channels nonetheless may capture the lion’s share of the gains. The supplier is often left with little revenue to devote to upgrading capabilities”.

On the other hand, the GVC literature emphasizes the increasing importance of specialization in stages of production rather than products or sectors. In this sense, it provides an explanation as to why specialization may not be properly captured by data on value-added of aggregate sectors. The intra-industry value-added and employment structure shifts become more important to explain the effects of productive fragmentation on the less-skilled labor employment. Other new theories of international trade models assuming increasing returns to scale and imperfect competition attempt to explain the within industry trade between countries with similar technology and factor endowments. According to these theories scale economies and product differentiation play a major role in trade between countries with similar factor endowment. Hence, countries specialize and trade occurs not only because of initial comparative cost advantage, but because the access to bigger consumer markets reduces the product unit cost and increases profit margins. In these

models value-added and labor shifts led by international trade may not be observable across aggregate sectors either.

### **3. Productive fragmentation and intra-industry employment structure**

In this section we turn to the hypothesis on how productive fragmentation affects the intra-industry employment structure. First, it can change the composition of firms within an industry. The increased competition may lay off less competitive plants, leading to increased participation of more competitive plants that tend to have higher labor productivity and higher capital and skilled labor intensity (Harrigan and Reshef, 2015). Melitz (2003) develops a model with heterogeneous firms in which trade exposure induces only the more productive firms to enter the export market and simultaneously forces the least productive firms to exit.

In developing countries, outsourcing from developed countries may act as a channel for technological diffusion, as the imported inputs carry technologies which are domestically non-existing (Grossman and Helpman, 1991). The new technologies are normally associated with a higher demand to skilled labor, which tend to change the within firm employment structure in developing countries. A diverse of studies offer empirical support for this hypothesis. Giovanetti e Menezes-Filho (2007) find a positive relation between the reduction of tariffs in intermediary goods and the employment share of college workers in the Brazilian firms situated in the state of São Paulo from 1990 to 1996. The effect was stronger for firms that used inputs that were also skilled labor intensive. Fanjzylber e Fernandes (2009) find that in 2003 the Brazilian firms that used imported inputs and received FDI were associated with a higher share of skilled labor in total employment. Paul e Yasar (2009) find evidence that imports of intermediate goods reduced the relative employment of the less-skilled workers, compared to technical and administrative workers, in the firms of Turkey from 1990 to 1996. Meschi et. al. (2011) find similar results using firm-level data from 1980 to 2001. The increase in international openness led to increased relative demand for skilled labor in Turkey. In addition, the industries belonging to sectors with the highest growth in the share of imported inputs from developed countries had a greater increase in the demand for skilled labor. Crinò (2012) uses firm-level data for 27 transition economies in Europe and Asia in the years 2002 and 2005. The author finds a positive relation between the imports of inputs and the relative demand for skilled labor.

However, unlike previous studies, Pavcnik (2003) finds evidence that the use of imported inputs is not related to the demand for skilled labor in Chilean firms, considering panel data with fixed effect or time series, from 1979 to 1986. Fanjzylber and Fernandes (2009) find a negative relationship between skilled labor demand and input imports in China using cross-section firm level data in 2001. Since the authors have data from a single point in time, it is not possible to draw conclusions about the evolution of the intra-firm demand for skilled work as a result of increasing outsourcing.

The FDI involving outsourcing of firms from developed may transfer production stages that are relatively skilled intensive in developing countries although they are relatively less-skilled labor intensive in the former countries. Feenstra e Hanson (1996) develop a model which in the first stage, tasks that are less skill intensive within a firm are transferred to countries of lower labor costs. However, as new technologies become available and regulatory and institutional changes facilitate commercial integration, more complex tasks, that use skilled labor more intensively, also become more competitive in these countries. Hence, in a second stage, relative demand for skilled labor would also increase within industries in countries where unskilled labor is more abundant. Feenstra e Hanson (1997) find evidence for this hypothesis with a positive relation between FDI and

the share of skilled labor in total employment in Mexico between 1975 and 1988 using panel data for industries and states. The authors stress the fact that the majority of the increase in skilled labor demand occurred within the industry rather than by the reallocation of employment between industries. Harrison and Hanson (1999) find similar results between 1984 and 1990. They also find a positive correlation between the skilled labor share of employment within industries and inputs imports and with the reduction in tariffs and quotas.

Finally, Raworth and Kidder (2008) point to another aspect of GVCs that refers to the "lean" production strategy. The goal of lean production would be to eliminate waste, or eliminate any activity that creates a cost, but does not create any value. The problem with this strategy, for Raworth and Kidder, is that those who define what constitutes value are the leading companies whose value conception generates chains of suppliers that transfer costs and risks to their next suppliers in the chains, who in turn transfer them for workers. Gutelius (2015) argues that the growth of the temporary labor supply industry plays a significant role in the restructuring of the labor market in GVCs and in the increase of precarious employment. Temporary hiring agencies push the possibility of transferring costs and risks to some segments of workers to the limit. Conducting a case study in the logistic global supply chain firms in the U.S, Gutelius find evidence of reduced permanent jobs for low-skilled workers.

#### **4. Productive fragmentation and less-skilled labor income share**

In the next subparagraphs we will explore the mechanisms through which productive fragmentation may affect the intra-sectoral less-skilled labor share of value-added.

##### **4.1 Relative labor demand and the Stolper Samuelson Theorem or Decreasing Rents?**

The within industry less-skilled labor share of value-added may change because of changes in the employment structure caused by fragmentation. One mechanism is the direct one, considering the labor share of value added and relative wages constant, changes in the ratio of skilled to unskilled labor employed will imply a change in each skill labor category share of the industry value-added. However, productive fragmentation can also affect relative wages and the total labor share of value-added. One implication of the HO model in competitive markets, known as the Stolper-Samuelson theorem, is that trade integration leading to increasing relative demand for less-skilled labor in developing countries would increase their relative returns compared to capital and skilled labor (Stolper and Samuelson, 1941).

However, the empirical evidence pointed to a decrease in the income share of less-skilled workers in developing countries in the recent decades. A comprehensive study held by Timmer et. al. (2014), covering 560 production chains, found that between 1995 and 2009, there was a shift in the functional distribution of the value added of GVCs in favor of high skilled labor and capital, in both developed and developing countries. The developing countries included in their study are Brazil, China, India, Indonesia, Mexico, Russia and Turkey. Among them, Turkey was the only country where there was an increase in low-skilled labor share in the manufacturing GVCs' value added.

According to Behrman et. al. (2000) findings, trade liberalization contributed to an increase in inequality between the less skilled and more skilled workers in developing countries. Their study show that trade liberalization contributed to the increase in the

average real wage using panel data for 18 Latin American economies between 1980 and 1998. The strongest positive effect was on the average wage of college degree workers. The effect on workers with full secondary education was also positive, but lower, while the effect on the average salary of workers with less years of study was negative and very significant.

The evidence for country-specific cases is mixed. Robbins (1997) and Attanasio et. al. (2004) find a positive relationship between trade liberalization and the dispersion of wages in Colombia from 1976 to 1994 and 1990 to 1996. Similar results are found for Chile by Beyer, Rojas and Vergara (1999). Galiani e Sanguinetti (2003) also find a positive association between the rise in import penetration and the rise in the college wage premium in the industry-level in Argentina. Harrison and Hanson (1999) find similar results for the Mexican case, while the result of Robertson (2005) for Mexico is mixed. Pavcnik. et al. (2004) find no evidence that trade reforms have affected neither the skill premium nor the industry-wage premium for workers with the same characteristics in Brazil for the period 1987-1998. On the other hand, Gonzaga et. al. (2006) and Ferreira et. al. (2010) find evidence of a negative relationship between trade liberalization and the skill premium between 1988 and 1995 in Brazil. Mishra and Kumar (2005) find a negative relation between variations in wage premiums and tariffs on imports in Indian industries between 1983 and 2000. Amiti and Cameron (2011) find a strong relationship between tariff reductions and the fall in the Indonesian skill premium between 1991 and 2000.

There is evidence that the evolution of the relative prices after trade reform had a significant effect on the relative wages in country-specific cases. Robertson (2005) examines the effects of Mexico's entry into the GATT (General Agreement on Tariffs and Trade) in 1986 and into North American Free Trade Agreement (NAFTA). The author shows that, in the first case, as the tariffs were reduced mainly for low-skilled sectors, the price of these products fell, which led to the reduction in the relative salary of these workers. In the second case, free trade with two skilled labor intensive nations reduced the prices of skilled labor intensive goods and, consequently, the skill premium. Robertson also estimates that the relationship between prices and relative wages appears in a space of 3 to 5 years. In the case of Chile, Beyer, Rojas and Vergara (1999) show that the decrease in the relative prices of labor-intensive goods explains the reduction in the relative wage of the less-skilled workers. Thus, economic openness was associated with the increase in the skill premium (by years of study), during the period 1960-1996. Gonzaga et. al. (2006) note that although tariff reduction was not correlated with sectoral skill intensity in Brazil, in the more skilled labor intensive sectors, the reduction of tariffs resulted in a greater drop in prices, that explained the reduction in the skill-premium.

The empirical evidence is stronger for a trade-induced fall in industry-specific wage premium than for an economy-wide skill premium reduction, predicted by the Stolper-Samuelson effect. An alternative explanation for these results is that increasing competition reduces the domestic mark-ups and the rents shared with workers. Where the industries which use low-skilled labor more intensively are the most affected, with larger tariff cuts or greater competing import penetration, the aggregate ratio of skilled to unskilled labor wages tend to increase and vice-versa.

The results of Harrison and Hanson (1999) for the positive relationship between trade openness and income inequality in Mexico shows there were little output or employment shifts and the adjustment occurred via reduction in wages and mark-ups in the previously protected and highly unionized sectors. The reduction of tariffs occurred mainly in the more unskilled labor intensive sectors. The evidence found by Attanasio et. al. (2004) in Colombia from 1990 to 1996 was that the industry-specific wage premium was further reduced in those sectors where there was a greater cut in tariffs and, as these sectors already paid a lower premium, there was an increase in wage inequality. Arbache, Dickerson and



Green (2004), controlling for education and experience, find evidence that wages in the tradable goods sector has substantially reduced by the increase in the degree of trade openness. There was also a less intensive reduction in non-tradable goods. These results are consistent with the view that trade liberalization has increased the degree of competition and reduced incomes in the tradable sector.

Where the less-skilled share of rents are already low, firms may adjust to increased international competition by lowering the skill-premium, leading to industry-specific decrease in skill-premium. Amiti and Cameron (2011) find that in Indonesia, between 1991 and 2000, the drop in the skill premium was more robust within firms: a drop of 10 percentage points in tariffs was associated with a 10 percent reduction in the skill premium for an average importing firm. In other cases, firms may adjust reducing mark-ups. Ahsan and Mitra show that in Indian firms' between 1988 and 2003, international trade increased the labor share of value-added in the smaller and more labor-intensive firms and reduced the labor share in larger ones. The mark-ups in the former companies were negatively affected by international competition. Therefore, the increase in the labor share in these companies does not come from the improvement in wages, but from the fall in profits.

#### **4.2 Productive fragmentation and increased competition in lower value-added stages of production**

Productive fragmentation increases competitiveness in the less-skilled intensive low-value-added stages of production eroding incomes and exerting pressure to costs reduction, which can lead to lower wages, less stable jobs and poor work conditions (UNCTAD, 2013). Usually, in a vertically integrated enterprise, the various segments of workers tend to appropriate, to some extent, of part of the firm's incomes, depending on collective bargaining institutions (Nathan and Sarkar, 2016). However, the workers' earnings in the sub-contracted stages of the production process are decoupled from the value of the final product. This allows a greater concentration of the GVCs value-added in the host companies. The effect of China and low-cost manufactures, coupled with increased capital mobility through financial deregulation, intensifies competition in the lower value-added stages of production, which are mainly located in developing countries (Medeiros and Trebat, 2017).

A great number of studies within the a GCV approach engage in understanding the process of economic upgrading defined as the country progress to higher value added productive stages (Gibbon and Ponte, 2005). According to neoclassical theory, technology is the main determinant of labor demand and, together with labor supply, of wages. Hence, this literature frequently assumes that economic upgrading in GVC automatically translates into social upgrading through better jobs and wages. Following this perspective, the influence of international trade, via GVC, on labor markets depends, in the medium run, on the capacity of countries to advance to higher value added productive stages.

Less attention has been directed towards the social upgrading which is defined as the improvement in work conditions, job quality, social security and social rights (Milberg and Wrinkler). Social upgrading encompasses the access to better jobs that may occur together with economic upgrading when workers acquire higher levels of qualification on the job, allowing them to obtain better occupations within the GVC (Barrientos et. al., 2011). Bernhardt and Milberg (2011) analyze four GVCs - clothing, horticulture, cell phones and tourism - involving 10 to 20 countries each. Economic upgrading is defined as the increase in the market share of exports and the unit value of exports, while economic upgrading is defined as employment and real wages growth. They find that social downgrading was more frequent than the economic downgrading or social upgrading. The authors note that in only

half of the cases economic upgrading was associated with social upgrading. But in every case where social upgrading occurred, economic upgrading was present, evidencing that this is a necessary condition, but not sufficient. Bernhardt and Pollak (2015) conduct a similar work, but analyze the clothing, automotive, mobile and cellular GVCs. Like Bernhardt and Milberg, the authors find evidence that social upgrading is more likely to occur in cases where there is economic upgrading. The studies of Milberg and Wrinkler (2011) and Bernhardt and Pollak (2015) support that the capacity of the nations to advance to higher value added stages of production within the chains is nearly a necessary condition for the GVC participation to translate into both higher employment and wage levels. However they also find that it is not a sufficient condition.

Case studies on the effects of developing countries GVC participation on the labor markets support that competition in lower value-added stages of production is pervasive for segments of low-skilled workers, even when economic upgrading is present. For example, Rainbird and Ramirez's (2012) analysis of Chile's salmon industry insertion in GVCs showed that labor market improvements were insignificant. Although some jobs were created requiring a higher level of qualification, the impact on qualification or career advancement plans were very small. Producers compete in the international market through price and cost reduction, pressing wages and working conditions. Along the same lines, Rossi (2013) analyzes the case study of the clothing industry in Morocco. The author notes that the main social improvements, in terms of labor rights and standards, generated by the GVCs were limited to workers with stable and usually permanent jobs. In addition, the study indicates that the limitations on the extent of benefits to irregular workers, such as casual workers, migrants and subcontractors, are structurally inherent. Economic upgrading was associated with greater pressure for flexibility and speed of delivery. To meet the demands, supplier firms use a mix of job categories, employing regular workers to ensure quality and consistency of production, and irregular workers to deal with order fluctuations and costs pressures. While for regular workers, economic upgrading was associated with increased training and higher labor rights, for irregular workers, it meant a social downgrading, with casual or non-existent employment contracts, low wages and long working hours. Analyzing the case of Vietnam garment industry insertion in GVCs, Nadvi et. al. (2004) also concludes that workers gains were unevenly distributed. Workers employed in state-owned enterprises or large multinationals have benefited from increased employment and better wages. However, small private firms had difficulties accessing higher value chains and mainly supplied for regional buyers. These firms employed relatively more marginalized workers, offered worse working conditions and lower wages.

### **4.3 Decrease in labor bargaining power relative to capital**

The argument of reduction in bargaining power, unlike Stolper-Samuelson's theorem, assumes imperfect markets under which labor and capital bargain over the distribution of incomes (Brada, 2007). In institutionalist theory, the relative power of workers in the bargaining process, influenced by labor market institutions, plays a central role in determining wages. Productive fragmentation may have a disarticulating effect on labor unions as production split in stages and workers are dissociated from the final product which they contribute for. It is also associated with increasing capital mobility facilitating the reallocation production to other geographic locations. The threat to capital reallocation diminishes even further workers bargaining power.

Feliciano (2001) finds that in Mexico, between 1986 and 1990, there was a reduction in the relative wages of the less-skilled workers due to the reduction in the relative wage in the industries that lost protection through import quotas. On the other hand, they found no

evidence that the increase in inequality has occurred due to changes in prices or import penetration. The author then suggests that it has been the reduction in the bargaining power of workers that explain the reduction of wages in previously protected sectors. Oyvat (2011) examine the effect of globalization on the labor share of income in Turkey between 1981 and 2001 using industry-level panel data. The study analyzes the effect of trade flows on the labor share in low-skilled, middle-skilled and highly skilled labor intensive sectors. The results point to a negative impact of the intensity of exports on the labor share in all three sectors. Jayadev (2007) using panel data for a sample of over 100 countries between 1972 and 1995 finds evidence of a strong negative correlation between financial openness and labor share across all samples and sub-samples, except for low income countries. The correlation is increasing for economies with higher incomes and higher unionization rates. Controlling for the level of trade openness, the impact of financial openness is reduced; with both variables showing a negative and significant relationship with the labor share of income.

Another mechanism from which economic integration and productive fragmentation may decrease workers bargaining power is by closing formal job positions and increasing the unemployment level. Revenga (1997) analyzes the effect of trade liberalization on employment and wages in Mexican manufacturing plants between 1984 and 1990. According to his empirical results, trade liberalization affected the level of employment negatively by reducing industrial output. Attanasio et. al. (2004) also show that the increase in the size of the informal sector is associated with the increase of external competition in Colombia. Tariffs and exposure to international trade were positively related to the increase in sectoral informality between 1990 and 1996. Menezes-Filho and Muendler (2011) find evidence that the reduction of tariffs in Brazil in the 1990s led to the reduction of employment in previously protected industries. These workers were not completely absorbed by competitive firms in the international market. On the other hand, the authors find evidence that the reduction of tariffs on inputs increases the retention of workers. They also point out that commercial liberalization led to the transition of workers to the services sector, unemployment, and abandonment of the labor force, but it was not related to informality. Gaddis and Pieters (2014) using data from Brazilian microregions between 1991 and 2000 also found evidence that trade liberalization reduced the rate of labor force participation and the employment rate, especially among low-skilled workers. Karmbhampati and Krishna (1998) investigate the commercial reform in India in 1991 on the level of employment. The authors use panel-level panel data for five industries between 1987 and 1993. Their results point to an insignificant effect of reducing tariffs on the level of employment in general or within each industry.

There is evidence that increasing labor market flexibility reduces the negative effect of international trade on formality and employment rate. However, reforms that are related to the greater flexibility of the labor market reduce the benefits of formal employment, especially its greater stability in relation to informal employment. Goldbergh and Pacvinik (2003) study the relationship between trade liberalization and informality in Colombia between 1986 and 1998 and Brazil between 1987 and 1998. The authors do not find a significant correlation between variables in Brazil. In Colombia, however, there is evidence that trade liberalization led to increased informality in the period preceding reforms that increased labor market flexibility. Hasan et. al. (2012) analyze how trade liberalization affects the probability that the worker in a particular industry and in a given state will become unemployed in India. Unemployment data by industry and state covered eight years from the period beginning in 1987 to 2005. The authors found evidence that liberalization is associated with a reduction in the probability of unemployment in urban and rural workers. This effect is stronger and more robust for urban workers. The effect of

liberalization was also stronger for workers in states where labor market was more flexible and workers in net export industries.

The effects of trade liberalization on employment may be different in the short and medium term. Dutt et. al. (2009) analyze the relationship between trade policy and unemployment using cross-country and panel data for 71 countries including developing countries. The cross-sectional analysis is performed for the mean of the variables by country in 1990; the time series for each country range from 1985 to 2004. In cross-sectional estimates, evidence of a negative relationship between trade protection and the level of unemployment is found. In the analysis of panel data, the authors find evidence that unemployment and trade liberalization are positively correlated in the short run, but negatively correlated in the long run. There was no evidence of significant differences between the effects of liberalization between countries more or less labor abundant.

Trade in intermediate goods can also influence the labor bargaining power by changing the stability of employment. According to Hoegrefe e Yao (2015), the intensification of trade in intermediates can augment the elasticity of labor demand. The *outsourcing* can be used as a strategy to export the risk related to market volatility. Firms would tend to maintain in their countries of origin the less volatile activities, outsourcing the more volatile, reducing their adjustment cost. As developing countries are the usual recipients of the outsourced activities, they may experience a corresponding increase in employment volatility. Hogrefe and Yao (2015) analyze how the increase in the import of inputs affects the risk on labor rents with panel data for German industries. Risk is defined as the variability of shocks on incomes that do not dissipate over time. The results show that the permanent risk on workers' incomes is reduced by outsourcing.

## **Final considerations**

The empirical evidence discussed, in general, falsifies what is predicted by the HO model and the Stolper-Samuelson theorem that greater international integration would lead to increased relative demand for less skilled labor and its relative wage in developing countries. The increase in the relative demand for more skilled labor associated to the increase of international trade occurred mainly intra-firm and intra-sector, via skill upgrading through technological spill overs. In the post-trade liberalizing period, the evolution of the relative demand for labor in terms of skill category varies according to the sectors most exposed and vulnerable to international competition.

There was evidence that the change in relative prices, induced by trade liberalization, influenced the relative wages of more and less skilled workers. The main channel seems to be the transmission of the reduction in mark-ups, due to an increase in competition, for wages. However, in the post-liberalizing period there is no evidence of a generalized increase in the relative prices of low-skilled labor intensive goods in developing countries, as predicted by standard trade theory. In the most recent period, on the other hand, empirical investigations that goes beyond trade liberalization and uses the GVC approach reinforces the thesis that, in a commercially more integrated world, the competitive pressure exerted on stages of production held in developing countries, have perverse effects on mark-ups, labor bargaining power, wages, and employment conditions of the less-skilled workers.

The empirical studies of Bernhardt and Milberg and Bernhard and Pollack (2015) presented evidence that economic upgrading related to structural change for the production of goods and services with higher value added is a necessary condition for the benefits of global integration to be diffused in the labor market. However, economic upgrading is not a sufficient condition. The empirical results also tend to corroborate the hypothesis that the

increase of the international integration contributes to the reduction in the bargaining power of workers, especially the less skilled, with positive impact on the income inequality and negative impact on the labor share of national incomes. The increase in inequality was associated with the reduction in the level of wages of the less-skilled workers and of the individuals in the poorest income deciles.

Furthermore, the fact that there is a potential compensation for the main disadvantaged in the path of economic integration does not mean that these will be compensated in practice (Antras et al., 2017; Stiglitz, 2018). “Compensation is likely to remain inadequate, is hard to render credible, and fails to address deeper conflicts trade agreements pose. Much better solution: make the rules fairer ex ante, instead of compensating ex post” (Rodrik, 2018). For the economic benefits of global integration to be translated into social development, Mayer and Pickles (2010) advocate for the role of governance institutions in promoting better working conditions. The authors refer to institutions of governance as public institutions related to government policies and regulations; in the form of social norms and standards established by companies; international and non-governmental organizations, social movements and consumer demand for social responsibility. Selwyn (2013), on the other hand, is skeptical of the "top-down" approach, which argues that advances for workers in GVCs must come from the collective action of firms, states and international organizations. The author advocates a "bottom-up" approach in which changes in working conditions are conditioned by the relative power of workers and, therefore, labor organizations play a central role. There is empirical evidence in favor of Selwyn's argument. Nadvi (2008) reports that even after a decade of collective action among global buyers, government and international institutions for the prevention and monitoring of child labor, cluster production and supply and production of soccer balls in Pakistan remained prone to the use of labor child. Riisgaard (2009) shows that the adoption of private labor standards by leading companies in the flower industry had limited impact on working conditions. Private standards treat working conditions as independent of the governance structure of the value chain, where cost cutting strategies and rigid supply deadline requirements promote work flexibility rather than organization.

Finally, we observed that much of the empirical literature on international trade and labor markets focus on commercial liberalization and its more immediate effects. There are few studies analyzing the decade of 2000s in which there was an acceleration of international trade and, in particular, the fragmentation of production and trade in intermediate goods. The GVC approach to trade and industrial policy is still poorly targeted for its consequences and what is needed to promote socio-economic development in the least developed countries (Fento and Ponte, 2016). There is room in the literature for empirical works that seek a more comprehensive understanding of the impact of GVCs on the labor markets of developing countries. The case studies are of great importance for understanding the relationships that occur along the chains, with their specificities, and how these relations translate into opportunities for economic growth and social development. However, the evidence from this methodology is limited in terms of the general effects of CVGs diffusion on the labor markets.

## References

AHSAN, R., MITRA, D (2014). Trade liberalization and labor's slice of the pie: Evidence from Indian firms. **Journal of Development Economics**, 108, 2014, p. 1–16.

- ALVAREDO, F., GASPARINI, L., 2015. Recent trends in inequality and poverty in developing countries. In: ATKINSON, A., BOURGUIGNON, F. (eds.). **Handbook of Income Distribution**, 2015, v. 2, p. 697–805.
- AMITI, M., CAMERON, L. Trade liberalization and the wage skill premium: evidence from Indonesia. **Journal of International Economics**, 87 (2), 2012, p. 277–287
- ANDERSON, E. Openness and inequality in developing countries: a review of theory and recent evidence. **World Development**, 33 (7), 2005, p. 1045–1063.
- ANTONELLI, J. Emerging Powers Development, Global Economic Crisis and Value Chains Restructuring. In: REHBEIN, B. (ed.). **Globalization and Inequality in Emerging Societies**. New York: Palgrave McMillan, 2011.
- ANTRÀS, P., de GORTARIA, A., ITSKHOKIB, O. Globalization, inequality and welfare. **Journal of International Economics**, n.108, 2017.
- ARBACHE, J. S., DICKERSON, S., GREEN, F. Trade liberalization and wages in developing countries. **Economic Journal**, 114, F73–F96, 2004.
- ATTANASIO, O., GOLDBERG, P., PAVCNIK, N. Trade reforms and wage inequality in Colombia. **Journal of Development Economics** 74 (2), 2004, p. 331–366.
- BALDWIN, R. Trade and industrialisation after globalisation's 2nd unbundling: how building and joining a supply chain are different and why it matters. **NBER Working Paper**, n. W17.716, 2011.
- BARRIENTOS, S., GEREFFI, G., ROSSI, A.. Economic and social upgrading in global production networks: A new paradigm for a changing world. **International Labour Review**, 150 (3–4), 2011, p. 319–340.
- BEHRMAN, J. R., BIRDSALL, N. SZEKELY, M. Economic Reform and Wage Differentials in Latin America. **LADB Research Working Paper**, n. 435. Inter-American Development Bank, Washington, D.C, 2000.
- BERNHARDT, T., W. MILBERG. Economic and Social Upgrading in Global Value Chains: Analysis for Horticulture, Apparel, Tourism and Mobile Telephones. **Capturing the Gains Working Paper**, n. 6, 2011.
- BERNHARDT, T.; POLLAK, R. Economic and Social Upgrading Dynamics in Global Manufacturing Value Chains: A Comparative Analysis. **FIW Working Paper**, n. 150, Março, 2015.
- BEYER, H., P. R, VERGARA R. Trade Liberalization and Wage Inequality. **Journal of Development Economics**, v. 59, p. 103–123, 1999.
- BIGSTEN, A.; DUREVALL, D. Trade Reform and Wage Inequality in Kenya, 1964-2000. **Working Papers of Economics**, Goeteborg University , p. 2-3, 2004.
- BRADA, J. The distribution of income between labor and capital is not stable: But why is that so and why does it matter? **Economic Systems**, 37, 2013, p. 333–344
- CHAMBERS, D., DHONGDE, S. Convergence in income distributions: Evidence from a panel of countries. **Economic Modelling**, 59, 2016, p. 262–270
- CRINÒ, R.. Service offshoring and the skill composition of labor demand. **Oxford Bulletin of Economics and Statistics**, 74 (1), 2012, p. 20–57.
- DAVIS, D. R., MISHRA, P.. Stolper-Samuelson is Dead: And Other Crimes of Both Theory and Data. In: HARRISON, A. (ed.), **Globalization and Poverty**, Chicago: University of Chicago Press, 2007.
- DAVIS, D., WEINSTEIN, D. An Account of Global Factor Trade." **American Economic Review**, n. 91, v. 5, 2001.
- DECREUSE, B., MAAREK, P. FDI and the Labor Share in Developing Countries: A Theory and Some Evidence. **Annals of Economics and Statistics**, No. 119-120, Special Issue on Health and Labour Economics, December, 2015, pp. 289-319.

- DUTT, P. Labor Market Outcomes and Trade Reforms: The Case of India. In: HASAN, R., MITRA, D. (eds.). **The Impact of Trade on Labor: Issues, Perspectives and Experiences from Developing Asia**. North-Holland: Elsevier Science B.V., 2003. p. 1–45.
- DUTT, P., MITRA, D., RANJAN, P. International trade and unemployment: theory and cross-national evidence. **Journal of International Economics**, 78 (1), 2009, p. 32–44.
- FANJZYLBER, P., FERNANDES, A. International economic activities and skilled labour demand: evidence from Brazil and China. **Applied Economics**, 41 (5), 2009, p. 563–577.
- FEENSTRA, R.C., HANSON, G.H. Foreign Direct investment and relative wages: evidence from Mexico's Maquiladoras. **Journal of International Economics** 42, 1997, p. 371–393.
- FEENSTRA, R.C., HANSON, G.H. Global Production Sharing and Rising Inequality: A Survey of Trade and Wages. **NBER working paper**, n. 8372, 2001.
- FEENSTRA, R.C., HANSON, G.H.. Globalization, outsourcing, and wage inequality. **American Economic Review** 86, 1996, p. 240–245.
- FELICIANO, Z. Workers and Trade Liberalization: The Impact of Trade Reforms in Mexico on Wages and Employment, **Industrial and Labor Relations Review**, 55 (1), 2001, p. 95–115.
- FENTO, D., PONTE, S. Least-Developed Countries in a World of Global Value Chains: Are WTO Trade Negotiations Helping. **World Development**, 94, 2017, p. 366–374.
- FERREIRA, F.H.G., LEITE, P.G., WAI-POI, M. Trade Liberalization, Employment Flows and Wage Inequality in Brazil. In: NISSANKE, M., THORBECKE, E. (eds.). **The Poor under Globalization in Asia, Latin America and Africa**. Oxford: OUP, 2010.
- GADDIS, I., PIETERS, J., 2014. The gendered labor market impacts of trade liberalization: evidence from Brazil. **World Bank Policy Research Working Paper**, n. 7095.
- GALBRAITH, J. Inequality and economic and political change: a comparative perspective. **Cambridge Journal of Regions, Economy and Society**, 4, 2011, p. 13–27.
- GALIANI, S., SANGUINETTI, P. The impact of trade liberalization on wage inequality: evidence from Argentina. **Journal of Development Economics**, v. 72, n. 2, 2003.
- GIBBON, P., PONTE, S. **Trading down: Africa, value chains and the global economy**. Philadelphia: Temple University Press, 2005.
- GIOVANNETTI, B., MENEZES-FILHO, N. Trade liberalization and the demand for skilled labor in Brazil. **Economia** 7 (1), 2006, p. 1–28.
- GOLDBERG PK, PAVCNIK N. Distributional effects of globalization in developing countries. **Journal of Economic Literature**, 45, 2007, p. 39–82.
- GOLDBERG, P.K., PAVCNIK, N. The response of the informal sector to trade liberalization. **Journal of Development Economics**, 72 (2), 2003, p. 463–496.
- GONZAGA, G., MENEZES FILHO, N., TERRA, C. Trade liberalization and the evolution of skill earnings differentials in Brazil. **Journal of International Economics**, 68 (2), 2006, p. 345–367.
- GUTELIUS, B. Disarticulating distribution: labor segmentation and subcontracting in global logistics. **Geoforum**, 60, 2015, p. 53–61.
- HARRISON, A., HANSON, G., 1999. Who gains from trade reform? Some remaining puzzles. **Journal of Development Economics**, 59 (1), 1999, p. 125–154.
- HARRISON, A., McLAREN, J., McMILLAN, M. Recent Perspectives on Trade and Inequality. **Annual Review of Economics**, 2011.
- HASAN, R., MITRA, D., RANJAN, P., AHSAN, R.N. Trade liberalization and unemployment: theory and evidence from India. **Journal of Development Economics**, 97 (2), 2012, p. 269–280.

- HOEGREFE, J., YAO, Y. Offshoring and labor income risk: an empirical investigation. **Empirical economics**, 2015.
- JAYADEV, A. Capital account openness and the labour share of income. **Cambridge Journal of Economics**, 31, 2007, p. 423–443
- KAMBHAMPATI, U., KRISHNA, P., MITRA, D. The effects of trade policy reforms on labor markets: evidence from India. **Journal of International Trade Economics and Development**, 6, 1997, p. 287–297.
- KANBUR, R., ZHANG, X., 2005. Fifty years of regional inequality in China: a journey through central planning, reform, and openness. **Review of Development Economics**, n. 9, v. 1, 2005.
- KIS-KATOS, K., SPARROW, R. Poverty, Labor Markets and Trade Liberalization in Indonesia. **Journal of Development Economics**, 117, 2015, p. 94-106.
- KRATOU, H., GOAIED, M. How Can Globalization Affect Income Distribution? Evidence from Developing Countries. **The International Trade Journal**, 2016.
- LEE, E., VIVARELLI, M. The social impact of globalization in the developing countries. **International Labour Review** 145, 2006, p. 167–184.
- MAH, J. Globalization, decentralization and income inequality: The case of China. **Economic Modelling**, 31, 2013, p. 653–658.
- MEDEIROS, C., TREBAT, N. **Finance, Trade, and Income Distribution in Global Value Chains: Implications for Developing Economies and Latin America**. Rio de Janeiro: IE/UFRJ, 2016. (Texto para discussão).
- MEÑEZES-FILHO, N., MUENDLER, M. Labor Reallocation in Response to Trade Reform. **NBER Working Paper 17372**, 2011.
- MESCHI, E., TAYMAZ, E., VIVARELLI, M., 2011. Trade, technology and skills: evidence from Turkish microdata. **Labour Economics** 18 (Supplement 1), 2011, S60–S70.
- MILBERG, W., & WINKLER, D. Economic and Social Upgrading in Global Production Networks: Problems of Theory and Measurement. **International Labor Review**, 150 (3-4), 2011.
- MILBERG, W., & WINKLER, D. **Outsourcing economics: Global value chains in capitalist development**. Cambridge: Cambridge University Press, 2013.
- MILBERG, W., WINKLER, D. Economic Insecurity in the New Wave of Globalization: Offshoring and the Labor Share Under Varieties of Capitalism. **International Review of Applied Economics**, v. 24, n. 3, 2010.
- MISHRA, U., KUMAR, P. Trade Liberalization and Wage Inequality: Evidence from India. **Review of Development Economics**, 12 (2), 2008, p. 291–311.
- MUNDELL, R. A. International trade and factor mobility. **American Economic Review**, n. 47, v. 3, 1957.
- NADVI, K et. al. Challenges to Vietnamese firms in the world garment and textile value chain, and the implications for alleviating poverty, **Journal of the Asia Pacific Economy**, 9:2, 2004, 249-267.
- NADVI, K. Global standards, global governance and the organization of global value chains. **Journal of Economic Geography**, 8, 2008, p. 323–343.
- NATHAN, D., SARKAR, S.. A Note on Profits, Rents and Wages in Global Production Networks. **Economic and Political Weekly** 66, 36, 2011, p. 53-57.
- OYVAT, C. Globalization, wage shares and income distribution in Turkey. **Cambridge Journal of Regions, Economy and Society**, 4, 2011, p. 123–138.
- PAUL, C, YASAR, M. Outsourcing, productivity, and input composition at the plant level. **Canadian Journal of Economics**, 42 (2), 2009, p. 422–439.



- PAVCNIK, N. What explains skill upgrading in less developed countries? **Journal of Development Economics**, 71, 2003, p. 311–328
- PAVCNIK, N., ANDREAS, B., PINELOPI, G., NORBERT, S. Trade Policym and Industry Wage Structure: Evidence from Brazil. **World Bank Economic Review**, 18(3), 2004, p. 319-344.
- PIPKIN, S., FUENTES, A. Spurred to Upgrade: A Review of Triggers and Consequences of Industrial Upgrading in the Global Value Chain Literature. **World Development**, 20, 2017.
- POSNER, M. V. International Trade and Technical Change. **Oxford Economic Papers**, vol. 13, 1961.
- PUGA, D., VENABLES, A. The spread of industry: Spatial agglomeration in economic development. **Journal of the Japanese and International Economies**, n. 10, v. 4, 1996.
- RAINBIRD, H., RAMIREZ, P. Bringing social institutions into global value chain analysis: the case of salmon farming in Chile. **Work, employment and society**, 26(5), 2012, p. 789–805.
- RAMA, M. Globalization and Workers in Developing Countries, **The World Bank Policy Research Working Paper**, n. 2958, 2003.
- RAWORTH, K., KIDDER, T. Mimicking “Lean” in Global Value Chains: It’s the Workers Who Get Leaned On. In: BAIR, J. **Frontiers of commodity chain research**. Stanford University Press, 2008.
- REVENGA, Ana. Employment and Wage Effects of Trade Liberalization: the Case of Mexican Manufacturing. **Journal of Labor Economics**, 15(3), 1997.
- RIISGAARD, L. Global Value Chains, Labor Organization and Private Social Standards: Lessons from East African Cut Flower. **World Development**, 37 (2), 2009, p. 326–340.
- ROBBINS, D. 1997. Trade and Wages in Colombia. **Estudios de Economia** 24(1), 1997, p. 47-83.
- ROBERTSON, R. (2005) Relative Prices and Wage Inequality: Evidence from Mexico. **Journal of International Economics**, December 64(2), 2005, p. 387-409.
- RODRIK, D. **Has Globalization Gone Too Far?** Washington, DC: Institute for International Economics, 2007.
- ROSSI, A. Does Economic Upgrading Lead to Social Upgrading in Global Production Networks? Evidence from Morocco. **World Development**, 46, 2013. p. 223–233.
- SELWYN, B. Social Upgrading and Labour in Global Production Networks: A Critique and an Alternative Conception. **Competition and Change**, 17 (1), 2013, p. 75–90
- SHARMA, K. (ed.). **Trade, Growth and Poverty in Asian Developing Countries**. London: Routledge, 2003.
- STOLPER, W.F., SAMUELSON, P.A. Protection and Real Wages, **Review of Economic Studies**, v. 9, 1941, p.58-73.
- SYDOR, A. **Global Value Chains: Impact and Implication**. Foreign Affairs and International Trade Canada, 2012.
- TARLING, R., WILKINSON, F. Economic Functioning, Self-sufficiency and Full Employment. In: BURCHELL, B., DEAKIN, S., MICHIE, J., RUBERY, J. (eds.). **Systems of production markets, organizations and performance**. London: Routledge, 2003.
- THIRLWALL, A. P. **Trade, the Balance of Payments and Exchange Rate Policy in Developing Countries**. Cheltenham: Edward Elgar, 2003.
- TIMMER, M., ABDUL, A., LOS, B., STEHRER, R., De VRIES, G. Slicing Up Global Value Chains. **Journal of Economic Perspectives**, n. 28, v. 2, 2014.

- UNCTAD (United Nations Conference on Trade and Development). **World Investment Report 2013: Global Value Chains: Investment and Trade for Development**. Geneva: United Nations, 2013.
- VERNON, R. International Investment and International Trade in the Product Cycle, **Quarterly Journal of Economics**, v. 80, n. 2, 1966.
- WOOD, A. How Trade Hurt Unskilled Workers. **Journal of Economic Perspectives**, v. 9, 1995.
- ZHAO, Y. Foreign direct investment and relative wages: the case of China. **China Economic Review**, n. 12, v. 1, 2001.