

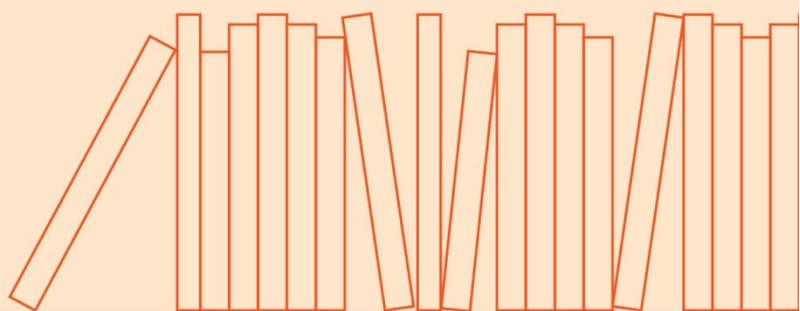
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ECLAC SUBREGIONAL HEADQUARTERS IN MEXICO



Economic and Social Upgrading:

Definitions, connections and exploring
means of measurement

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ABSTRACT

With the rise of the global value chain paradigm, integration into internationalized production networks has been seen as an opportunity for low and middle income countries to advance their economic competitiveness through increased access to global markets. However, there are concerns that economic gains made through greater integration in the global economy may not translate into improved social welfare. Recent research has attempted to identify the impact of greater integration in global value chains on domestic social indicators, arguing that economic upgrading through global value chains is a necessary but insufficient condition for social upgrading.

This paper reviews and synthesizes the literature on social upgrading, while exploring its connections with economic upgrading. Using the parsimonious method proposed by Bernhardt and Milberg and an alternative method that takes into account increases in national productivity, this paper analyzes the case of Mexico. Though the proposed approach to social upgrading can be made more sophisticated through the inclusion of more variables, in order to facilitate the replication of the analysis in developing countries where data are scarce, labor productivity, wages and employment were considered sufficient information to analyze economic and social upgrading.

The findings indicate the concurrent existence of economic downgrading and social upgrading in Mexico during the period from 1999 to 2008. This new measurement approach yields results consistent with the traditional understanding of the relationship between economic and social upgrading, and underscores the need for further research on the linkages between economic and social upgrading. This work also offers a methodological approach for deepening analysis of economic performance, and especially for the analysis of value chain upgrading.

INTRODUCTION

The internationalization of production processes towards what, in many cases, are called global value chains (GVC) responds to the realities of globalization. From the point of view of social agents and decision-makers in the public and private sectors, the existence of GVCs represents a change in paradigm from previous models where production activities were concentrated and strongly linked to sectors or industries at the national level. This new paradigm necessitates new approaches to design public policies that promote economic and social progress. In the case of low- and middle- income countries, adaptation to this productive paradigm is even more important, as it offers new opportunities and challenges to achieve more accelerated development. The countries of the Latin American and the Caribbean region are not an exception. These challenges are particularly important for the sub-region conformed by Mexico and Central America. As they are very open economies, insertion in GVCs is a crucial component of their economic strategies. In the case of the Central American countries, their relatively small size, openness and regional integration adds a significant difference when approaching industrial policies.

GVCs have attracted much attention from economic development theorists as they offer new paths to improve the competitiveness of low and middle income countries. Increased competitiveness leads to gains in productivity that helps countries to change the structure of their economies towards higher value activities. In this context, the concept of “economic upgrading” within the networks of production has taken a central role. However, gains in productivity and efficiency derived from economic upgrading do not always translate into improvements in employment, salaries, working conditions, or other factors contributing to socioeconomic development. These improvements in living standards and social well-being are captured under the concept of “social upgrading”.

While there exists a wide variety of literature detailing the benefits of increased participation in GVCs, little is known about the wider benefits of economic upgrading across the entire economic structure and the related social gains. Therefore it is difficult to imply general conclusions applicable to the design of public policies. This challenge is intimately related to the “micro” level nature of GVC, stressing the need to develop methodologies that account for the relationship between the two phenomena at a macro level. This is why this document focuses on responding two questions: what is social upgrading and how to measure it.

Improving the understanding of the connection between economic and social upgrading is a necessary condition to advance in the designing of industrial and commercial policies that contribute to the social progress envisaged in the 2030 Agenda. More precisely, a better understanding on how these two phenomena are related is an important component to ensure the implementation of the sustainable development goals 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all), 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), 10 (Reduce inequality within and among countries) 12 (Ensure sustainable consumption and production patterns) and 17 (Strengthen the means of implementation and revitalize the global partnership for sustainable development). It is worth mentioning that the creation of methodologies and capture of data that enhance the advance of the 2030 agenda is acknowledged as a challenge for the region by the Statistical Conference of the Americas, the subsidiary body of ECLAC that contributes to the progress of policies on statistics and statistical activities in the countries of the region (ECLAC, 2015 and ECLAC, 2014).

The objectives of this work are to contribute to the debate on how to measure and analyze the relationship between economic and social upgrading. Particular attention is given to the employment of data that can be found and compared among countries, so the analysis can be done across countries and not merely at the national level. It also aims to provide a brief review of the existing literature regarding the

concepts of economic and social upgrading, while discussing some of the challenges that explain the difficulty in measuring and determining the relationship between both concepts. Since statistical data is scarce in many developing countries, this document explores methods to analyze social benefits of GVCs with information that are more likely to be available in countries such as the Central American ones.

After this introduction, section 1 makes a brief review of the theoretical debate around the concepts and measurement of economic and social upgrading. In section 2 there is a discussion of the parsimonious analysis approach methodology suggested by Thomas Bernhardt and William Milberg (Bernhardt and Milberg, 2011), whose approach is based on an external market analysis. This view is complemented by the inclusion of national productivity as a dimension to take into account when seeing the evolution of social upgrading. Based on these approaches, section 3 analyses the performance of several sectors and subsectors of the Mexican economy in the period 1999 – 2008. Lastly, section 4 draws the main findings and conclusions.

I. “ECONOMIC UPGRADING” AND “SOCIAL UPGRADING”?

A. WHAT IS “ECONOMIC UPGRADING”?

The concept of economic upgrading is directly related to increases in competitiveness in value added processes and with national gains in productivity and labor qualifications. Within the context of GVCs, upgrading could be considered movement up the international value chain to capture a greater share of the economic benefits of production. Gary Gereffi described economic upgrading as “the process by which economic actors—nations, firms, and workers—move from low-value to relatively high-value activities in global production networks” (Gereffi, 1999, p. 171). He notes, for example, that upgrading in the apparel industry implies “the move from mere assembly of imported inputs to [...] to a more domestically integrated and higher value-added form of exporting” (Gereffi, 1999, p. 38).

Measuring economic upgrading involves analyzing various economic performance indicators, such as export quantity, export value, export unit value, market participation rates, labor productivity, technological intensity of production and value added. While consensus exists regarding the indicators involved in economic upgrading, their quantification and the reliability of data are more suspect. Milberg and Winkler speak to the problems of data and quantification in economic upgrading analysis, stating that it is important to know, for example, how much upgrading has occurred, which sectors in a country have experienced relatively more or less upgrading, or which country’s sector has experienced more upgrading compared to the same sector in other countries (Milberg and Winkler, 2010).

The study of economic upgrading has given rise to a shift in economic development theory. Contrary to old paradigms of upgrading to new economic sectors as means of economic development, the new paradigm involving economic upgrading in global value chains “does not necessarily mean transitioning from an agricultural to a services economy as traditional development views suggest [...] instead increasingly embracing higher value added production with the assistance of more technology, services, and know-how” (Taglioni and Winkler, 2014, p. 29). Therefore economies do not necessarily have to move from primary to tertiary sectors but from low added value tasks to high added value ones within productive activities.

B. TYPES OF ECONOMIC UPGRADING

There are numerous ways in which firms or regions can engage in economic upgrading within global value chains. Through improvements in production methods or product quality, actors along different points in a production network can increase gains by increasing efficiency or total sales. Differentiating between the various types of economic upgrading can help decision makers match their individual circumstances to an appropriate path for increased productivity and competitiveness. While different institutions use varying terminology to describe the different types of economic upgrading, there is general acceptance of the related concepts involved in each variety of upgrading.

One of the most common types of upgrading in international production networks is *process upgrading*. This type of upgrading involves “transforming inputs into outputs more efficiently by reorganizing the production system or introducing superior technology.” (Humphrey and Schmitz, 2000, p. 19) This type of upgrading is driven by the need to improve efficiency and reduce per-unit costs. While this type of upgrading is often spurred by technological investments, small and medium enterprises in Latin America have also successfully utilized production reorganization and clustering, allowing them to achieve economies of scale and process upgrading through horizontal linkages (Giuliani, Pietrobelli and Rabellotti, 2005). Examples of successful experiences in the region include the aerospace industry in Mexico, the salmon cluster in Chile, or the ICT clusters in Costa Rica and Uruguay, among many others.

Another common form of upgrading, *product upgrading*, involves improving the quality of the product, allowing for increased revenue through the sale of higher-value added products. Often the types of relationships within a production network contribute to the style and degree of product upgrading. Captive production networks demonstrate product upgrading, which is more strongly dictated by the lead buyer (Schmitz, 2004). However, more centralized coordination of production by lead firms (leading companies in a sector or industry whose practices influence other actors in the value chain) and hierarchical relationships often imply greater facilitation in terms of product upgrading. In this way, many firms within production networks engage in product upgrading at the behest of, and aided by, lead firms.

Firms may attempt to migrate into a higher-value added function or level of the value chain. This type of upgrading, *functional upgrading*, involves incorporating activities into the production process that increase the value added, but may not be directly related to the product. This can be accomplished by taking over up- and down-stream activities such as input sourcing and upstream logistics, design, assembly, packaging, transport, advertising, and marketing, among others (Hix, 2015). There is debate surrounding the impacts of globalized production on the prospects for functional upgrading. Some scholars have cited evidence of a “benign elevator” of functional upgrading once a firm enters into global production networks, while others contradict these findings with evidence of lead firms discouraging or obstructing the entry of upstream firms in activities within their core competences (Humphrey and Schmitz, 2002).

Whereas the previous forms of upgrading all involve movement within one value chain, firms may also upgrade by moving to a completely different value chain. This process, known as *chain or intersectoral upgrading*, involves adapting production competencies to enter a new value chain or production network. “Processes and functions may also change, or they may not, but both immediate and final customers are in new sectors” (Sturgeon, 2006, p. 18). An example of this type of upgrading would be a firm who produced leather shoes which moves into production of leather interiors for automobiles. This process is facilitated when there are more buyers in the market, creating multiple opportunities for the utilization of existing competences.

The type of upgrading experienced by an industry depends on various factors. Relationships with lead firms, governance of the value chain, particularities of the sector, technological intensity of products, proximity to end markets, and position in the value chain influence the type of upgrading a firm can pursue. The leading factor determining upgrading, however, appears to be relationships between lead buyers and suppliers. Strong lead firms often demand greater efficiency and lower costs, and also supply technological know-how and other forms of upgrading support.

C. WHAT IS “SOCIAL UPGRADING”?

Social upgrading is closely linked with the idea of inclusive growth as defended by different international organizations (OECD, 2014; ECLAC, 2012). The concept of social upgrading has been described as “the process of improvement in the rights and entitlements of workers as social actors by enhancing the quality of their employment” (Barrientos, Gereffi and Rossi, 2010, p. 7). In terms of global value chains, social upgrading can be understood as the portion of the gains from economic upgrading captured by the workers in a given firm, industry, or economy in a global production network. These gains may come in the form of monetary remunerations, or in terms of enhanced wellbeing. In short, social upgrading can be described as the social impact perceived by the workers involved in a production network. However, improvement in the rights and entitlements of workers can be measured in various ways, a problem which has befuddled academics seeking to explain social upgrading processes.

Social upgrading is generally agreed to include both quantitative and qualitative components. Total employment, wages, and female share of employment and wages are among the quantitative aspects of social upgrading. Qualitative measurements include labor conditions and enabling rights, such as freedom

of association and collective bargaining (International Labor Organization, 2015). Other measurements of social upgrading include formalization of employment, youth unemployment, higher education levels, overtime policies, and “decent work” standards among others. The notion of “decent work” has been developed over the last ten years by the ILO and operationalized in a series of papers in the International Labour Review in 2003. Decent work comprises four aspects of work: employment, social protection, workers’ rights, and social dialogue (Ghai, 2003).

However, social upgrading can be also understood in other dimensions such as gender, environmental rights, and use of natural resources or land ownership, among others. For instance, the gender component of economic upgrading and its impact on social upgrading helps to understand the gender effects of upgrading. Factors associated with the shift in paradigm toward global production networks have created circumstances favorable to greater female labor force participation and employment (Standing, 1999). However, globalized production networks have also created substantial risks for women in the workforce. Recent research has shown that economic upgrading to high-tech manufacturing in Southeast Asia has been accompanied by “defeminization” of the labor force (Tejani and Milberg, 2010). Despite perceptions among employers that women are more honest and reliable than men, evidence shows that women receive less training, lower pay, less prestige, and are disproportionately affected by casualization of labor (Christian, Evers and Barrientos, 2013). Women stand to benefit greatly from movement toward global production networks, but are also at risk for some of the worst forms of social downgrading. Special attention will be paid in the analysis of Mexico to the role of women in the process of economic, and especially social, upgrading. Further research could analyze natural resources, land ownership, migration movements and other potential dimensions of social upgrading.

D. CHALLENGES IN MEASURING ECONOMIC AND SOCIAL UPGRADING

Measuring economic and social upgrading and establishing the relationship between them is a complex task, as this analysis involves different sets of data depending on the scope and understanding of these concepts. The literature highlights three main methodological challenges in this exercise: the level of analysis and comparability of current studies, the quality of the data available and the conceptualization of social upgrading.

1. Level of analysis and comparability

Current literature tends to focus on case studies that measure economic and social upgrading at a particular level of aggregation, namely the nation (Plank, Rossi and Staritz, 2012), sector (Barrientos, 2014) or firm (Berger, 2005) level. This type of study has many advantages, allowing for qualitative analysis of factors such as enabling rights or labor standards, among others. The difference in the level of analysis may not allow for standardized applicability across sectors and countries, making comparability among studies difficult. As a consequence, findings are context-dependent and may not be pertinent to other countries, sectors, or firms. As Milberg and Winkler point out, “The problem of comparability of the case studies is compounded by the fact that there is such a variety of variables adopted to measure economic and social upgrading.” (Milberg and Winkler, 2011, p. 348) Lack of comparability among qualitative indicators is a common problem in the analysis of social upgrading, and suggests the need for improved indicators to adequately measure important aspects of social upgrading such as enabling rights that allow gains in working conditions and standards.

2. Quantification restrictions

A second challenge is the difficulty in measuring the variables related to both concepts of upgrading. For instance, measurement of economic upgrading based on criteria such as value added and unit value could yield inaccurate or misleading conclusions due to the asymmetry between the different country customs accounting methods. This is a recurrent issue pointed out by international organizations such as the UN (United Nations, 1983), IMF (Silver, 2007), OEDC (Ahmad, 2013) and WTO (OECD-WTO, n/d). As a

recent report by Rashmi Banga of the UN Commission on Trade and Development stated, “because of asymmetry in reporting exports and imports in national trade statistics, imports of country A from B often differ significantly from the exports reported from B to A” (Banga, 2013).

Aside from the unreliability of the data, availability of quantitative indicators can be problematic, as well. Data on wages, productivity, and employment are scarce for the majority of countries outside the OECD. These challenges force researchers to rely on qualitative data that is costly to obtain and difficult to compare across countries and sectors. In many developing countries, lack of statistics usually means that case study analysis based on qualitative data is the only viable form of investigation for economic and social upgrading. Because of the complexity of the concept, measurement of social upgrading will tend to rely more on qualitative indicators.

3. Understanding of the concept of social upgrading itself

Last, the measurement of social upgrading varies according to the way the concept is defined or understood. As previously mentioned, there is general agreement that economic upgrading is linked to gains in productivity. However, the definition of social upgrading is broader and contains multiple concepts that are not necessarily linked. Taking the approach that social upgrading is mainly a matter of income and wages leads to a debate about the variables affecting wage determination. Theoretical debates between institutionalist and neoclassical theories have been very prolific in this area. Considering that wages are determined by the dynamics of supply and demand, the marginal production of workers, the bargaining power of workers and trade unions or behavioral elements such as employees’ reservation wage, the prevalent internal wage structure, and employee’s consideration of wages as motivators, gives rise to discussions regarding which of these variables are appropriate to measure when analyzing social upgrading. Additionally, a broader understanding of social upgrading based on dimensions not related to employment and income might include a set of variables such as health, education, environmental or gender issues in the equation. Therefore, social upgrading can be measured by multiple indicators such as gains in wages, level of employment, labor standards and rights, female participation in the labor force, environmental performance, etc., depending on the approach taken.

E. CONNECTIONS BETWEEN ECONOMIC AND SOCIAL UPGRADING

Much literature has focused on the relationship between economic and social upgrading within GVC production networks. The traditional presumption has been that economic upgrading brings both improved export performance as well as social upgrading. According to neoclassical theory, “labor demand and thus wages are largely determined by technology. This connects economic to social upgrading” (Milberg and Winkler, 2011, p. 344). Recent work has shown, however, that economic upgrading is generally a necessary, but not sufficient condition for social upgrading. The mobile telecom sector in Asia and Africa, for example, has experienced very little social upgrading accompanying its economic upgrading (Lee, Gereffi and Nathan, 2013). In apparel global value chains, there appears to be positive correlation between economic and social upgrading, albeit with a number of examples of economic upgrading accompanied by social downgrading (Bernhardt and Milberg, 2012).

Due to these cases in which social upgrading did not accompany economic upgrading, the role of enabling rights has attracted more attention due to their effect on wage determination. Milberg and Winkler describe the theoretical debate of wage determination and the relationship between economic and social upgrading, saying, “In institutionalist theory, wages are the outcome of a bargaining process [...] In such a context, social upgrading is delinked from technological change per se and associated also with social institutions.” (Milberg and Winkler, 2011, p. 344) In this way, the strength and credibility of social institutions within a society influence wage determination under an institutionalist framework. For instance,

in Mexico wages have been seen as diverging from labor productivity (Moreno-Brid and Garry, 2014), lending credence to institutionalist theory.

Other factors that influence the link between economic and social upgrading include: particularities of specific industries, position within the global production chain, typology of labor, and status of workers, among others. Recent studies have found that economic upgrading often brings social benefits to permanent workers, while irregular workers often experience social downgrading (Lee, Gereffi and Nathan, 2013; Rossi, 2013; Bernhardt and Milberg, 2012) Governance and lead firm policies can also have an outsized effect on the quality of life of workers at all levels of the production chain (Nathan and Sarkar, 2011; Rossi, 2013).

The type of economic upgrading pursued can also affect social upgrading outcomes. For example, process upgrading in the textile and garment industry has introduced more efficient production processes based on new technologies, which require fewer laborers, leading to lower employment levels. However, the introduction of new technology requires worker training and leads to higher wages for trained workers. Thus, in the textile and garment industry, process upgrading has an ambiguous and segmented social effect (Rossi, 2013). Product upgrading in the tourism industry experienced a similarly dichotomous social upgrading result. Attracting multi-national chain hotels may have beneficial results for social upgrading. However, these potential gains are divided unevenly between formal and informal laborers. Business models based on “all-inclusive” hotels and resorts have less of a spillover effect in the local economy. Capacity to capture these gains depends on the negotiation capabilities of the investment recipients (Christian, 2012).

In sum, current literature has not reached a consensus on a single model that explains the connection between economic and social upgrading. While the general assumption is that economic upgrading leads to social upgrading, the exact correlation and form is not yet clear. How factors such as collective bargaining and labor rights, economic sector, kind of economic upgrading and other contextual issues impact social upgrading require further investigation.

II. CASE SELECTION, METHODOLOGY AND LIMITATIONS

A. CASE SELECTION

This analysis focused in the case of Mexico, which was selected for a number of reasons. The Mexican economy has been subject to significant reforms during the last 30 years. Commercial policy has evolved from protectionism to an ambitious trade liberalization agenda, a major milestone of which was the signing of the free trade agreement with the United States and Canada (NAFTA). Mexico is also member of the GATT and the WTO as well as an active member of a network of free trade agreements that links the country with a total of 45 other countries. Attraction of Foreign Direct Investment (FDI) and insertion in global value chains has been one of the key strategies pursued by Mexican administrations since the 1980s to achieve greater socio-economic development.

The result of this agenda can be evaluated as mixed. On the one hand, Mexico has changed its economic structure towards an export-oriented model integrated in the global economy, becoming one of the most open large economies in the world. Its export performance has also been accompanied by low and stable inflation and a relatively small fiscal deficit. According to the Mexican National Institute of Statistics and Geography's (INEGI) public database, the composition of the Mexican export basket has evolved greatly, and nowadays non-oil products represent more than 85% of the total exports while in 1980 they represented less than 20%. In addition, Mexican exports are to a large extent composed of manufactured goods of medium and high technological content which accounted for 44% and 22.2%, respectively, of the total value of Mexican exports in 2014 (ECLAC-SIGCI 2015).

On the other hand, the Mexican economic strategy has not been successful in achieving high and sustained growth. Indeed, while its contribution to world GDP was 2.6% in 1990 and 2.3% in 1996, it has fallen steadily since, reaching 2.1% in 2008 and 1.9% in 2014 (IMF, 2015). The growth performance in per capita terms is not better. From 1994 to 2012, Mexico's GDP per capita, in constant US dollars, expanded at an annual average rate of 1.1%. Although Mexico's trade position with the United States has shifted from massive deficit to surplus, the Mexican economy is lagging behind the United States in terms of labor productivity and even growth. This economic performance has not been able to reverse the situation suffered by 46% of the Mexican population who still lives in poverty (CONEVAL, 2015), a figure that increases when considering people in situation of vulnerability. Informal employment still prevails in the labor market, affecting around 60% of Mexican employees (ILO, 2014).

The case of Mexico is interesting as an example of how higher insertion in GVC does not necessarily translate into social gains across the entire economic structure, a dynamic that might also apply for the countries of the Central American region, which have pursued similar economic agendas and also have strong linkages with the US economy despite their smaller size as compared to Mexico. Understanding the connection between economic and social upgrading regains importance in such contexts.

B. METHODOLOGY

This paper utilizes a parsimonious approach developed by Bernhardt and Milberg for the analysis of economic and social upgrading. This approach presents a practical solution to the general weaknesses of the available upgrading indicators. As a result, it provides a framework that helps to measure whether economic or social upgrading occurs and that facilitates analysis of the relationship between these two kinds of upgrading. To operationalize this model, economic upgrading is understood as competitiveness gains within an economy, region, sector, firm or production network. Likewise, social upgrading is understood as gains in the welfare of employees within an economy, firm, or production network. The parsimonious approach and the variables

it uses allow an easy replication in countries with little economic and social data which is a relevant methodological element for this work.

Within this framework, economic upgrading occurs when there is: 1) an increase in world export market share, and/or 2) an increase in export unit value. These criteria imply some combination of increased sales of existing products and/or the production of higher-value products. Social upgrading occurs when there is: 1) an increase in employment, and/or 2) an increase in average real wages. This approach can account for the effects of some types of process upgrading which result in lower quantities, but higher quality of employment.

Both portions of economic and social upgrading are weighted equally. The formulae utilized for the calculation of parsimonious indicators are:

$$\text{Economic upgrading} = 0.5 * (\% \text{ change in market share}) + 0.5 * (\% \text{ change in export unit value})$$

$$\text{Social upgrading} = 0.5 * (\% \text{ change in employment}) + 0.5 * (\% \text{ change in real wages})$$

By measuring only external components (change in export unit value and change in market share), the parsimonious approach discounts changes in productivity that can occur at the domestic level (national productivity) but that do not translate directly into international trade patterns. Therefore a second formula where economic upgrading is measured by national productivity statistics in place of international market participation is substituted with the intention of obtaining a more complete depiction of the Mexican economy. Using labor productivity measurements from national accounts could provide a more internally-directed analysis that more fully reflects the performance of the economy.

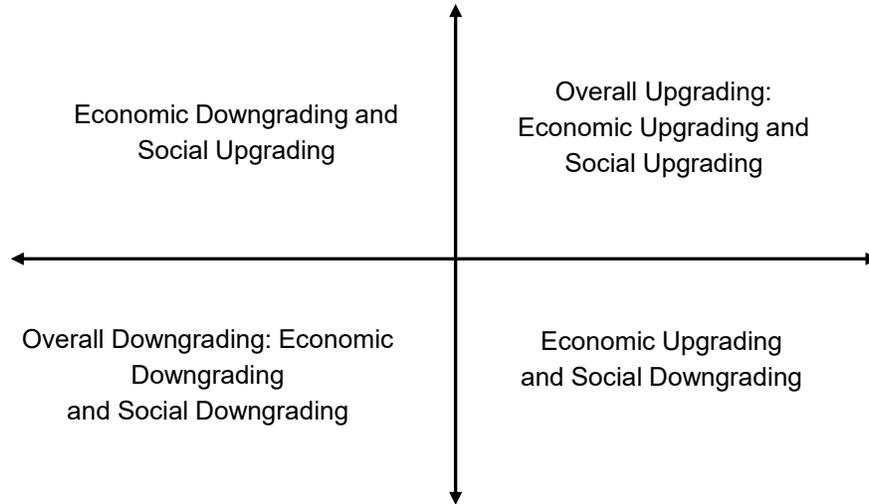
By substituting labor productivity growth statistics from INEGI (2015) over the same time span in place of growth in international market share, a new composite indicator can be created that can be utilized in a modified parsimonious approach. While the modified approach shares the same social indicators as the original parsimonious approach, the shift in economic terms of analysis should provide a novel approach to the analysis of economic and social upgrading. These new results can be compared with the results of the traditional parsimonious approach of Bernhardt and Milberg to determine the viability of including internally-focused data in the analysis of economic and social upgrading. In Mexico's case the data are robust enough that labor productivity statistics can also be broken down along gender lines, providing an added level of analysis not available in the original parsimonious approach. The formulae utilized for the calculation of the modified parsimonious indicators are:

$$\text{Economic upgrading} = 0.5 * (\% \text{ change in labor productivity}) + 0.5 * (\% \text{ change in export unit value})$$

$$\text{Social upgrading} = 0.5 * (\% \text{ change in employment}) + 0.5 * (\% \text{ change in real wages})$$

The resulting indicators can be plotted to determine whether a country, sector, or firm is experiencing economic upgrading or downgrading, and whether this economic upgrading/downgrading is associated with social upgrading/downgrading. Figure 1 shows the matrix utilized for determining economic and social up/downgrading:

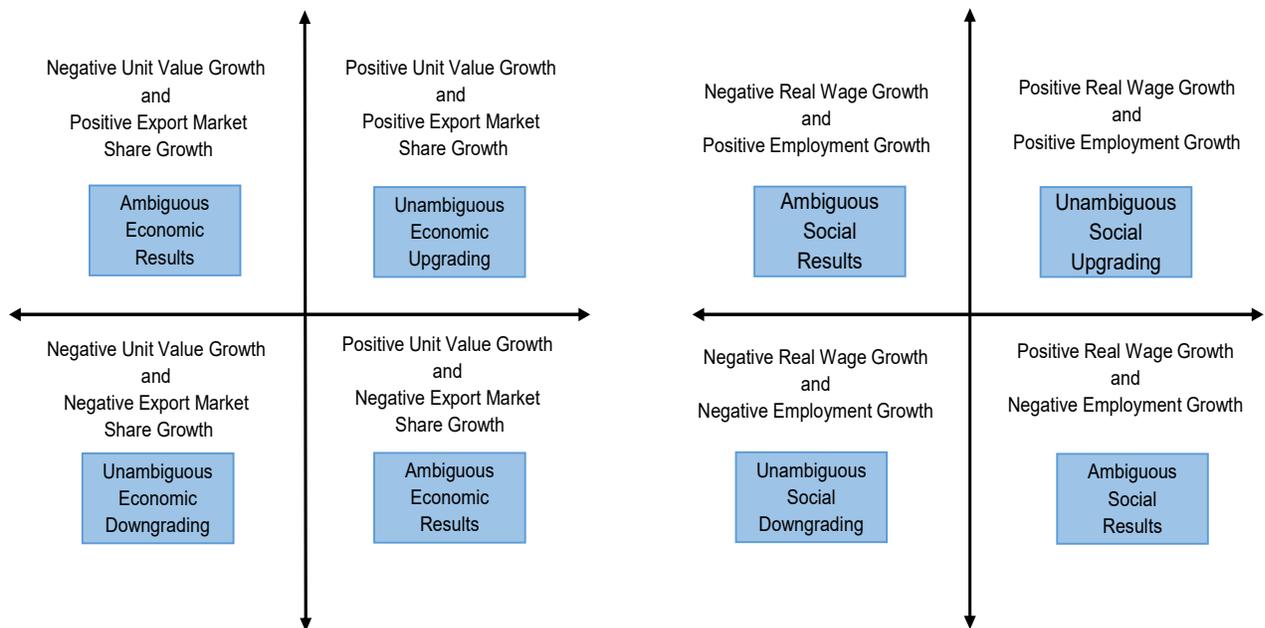
**FIGURE 1
ECONOMIC AND SOCIAL UPGRADING PERFORMANCE MATRIX**



Source: Bernhardt and Milberg, 2011.

To break down the findings into more detail, visualizations of both social and economic upgrading indicators have been created. Figure 2 shows the matrices used to disaggregate economic and social upgrading so as to analyze the movement of the individual components of upgrading indicators.

**FIGURE 2
DISAGGREGATED ECONOMIC AND SOCIAL PERFORMANCE MATRIXES**



Source: Own elaboration.

Information is also disaggregated by gender with the aim of observing potential divergences in outcomes between men and women. As this methodology considers the materialization of economic and social upgrading to occur when two criteria are satisfied, in the event that one of the criteria is positive and the other one is negative the result will be considered as “partially positive” or “ambiguous” upgrading.

This paper analyzes four aggregated sectors: 1) agriculture, 2) manufacturing, 3) mining, and 4) tourism, which represent a cross-section of the Mexican economy and vary across level of technology. The sector data were obtained by using two main sources: UN Comtrade for “export value and market share” and “unit value” indicators and ILO LABORSTA for “wage” and “employment” indicators. As UN Comtrade does not give data aggregated by sector, information was obtained by the sum of different Standard International Trade Classification (SITC) codes that were considered to belong to the activity of the sector. In the case of tourism, for obvious reasons, the indicators employed were not export nor export unit value, but rather “International tourism expenditures” (money spent by international tourists in Mexico) and “Number of arrivals”, the sources for which are the World Bank World Development Indicators (WDI). Productivity data was obtained from INEGI. ILO LABORSTA was used for wage and employment data. Annex 1 fully details the sources and composition of these sectors. Growth rates are calculated using the “geometric growth” method to obtain annualized growth averages. Comparisons using different statistical sources and growth rate calculations did not substantially alter the results presented here.

All monetary values (peso and dollar) are in real terms. The timeframe for the analysis spans ten years, from 1999 to 2008. This time period was chosen to exclude information provided during the 2008-2009 financial crisis, which drastically affected Mexican exports. Although the US economy was in full collapse by September of 2008 (Sorkin, 2008), and Mexican markets had fallen by more than 30% by November of that year (Vásquez Sánchez, 2010), the full effect of the financial crisis had yet to be felt by the Mexican economy. Mexican exports rose marginally in 2008 from their previous levels, however by the end of 2009 exports had fallen over 8% by volume and by more than 26% by value from the previous year (World Bank, 2015). To avoid skewed results, the ten-year period of analysis was chosen to disclude drastic outliers.

C. LIMITATIONS OF THE METHODOLOGY

As with all methodologies, there are drawbacks to the parsimonious approach. Rate-of-change analysis can be problematic when dealing with small scale, small sample size, or short time periods. By covering an entire decade, we hope to avoid some of the problems associated with time period identification. However, issues of scale are unavoidable in some circumstances; when selecting sectors to analyze, it is important to keep in mind their different shares of importance to the overall economy. Likewise, information that depends on global statistics necessitates interpretation. If, for example, the world agriculture market stagnates, then it would be possible for a country which experiences a drop in real export value and productivity to actually increase its export market share by merely outperforming the languishing world market. While it would be true to say that in this hypothetical example our subject of analysis remains more competitive in international markets than its competitors, it would be difficult to make the case that it is experiencing upgrading. The hypothetical situation in question underscores the idea that this approach depends on the analysis to make sense of the data. Despite these problems, the parsimonious approach can be useful for visualizing the movement of economic and social upgrading. This form of analysis also relies heavily on statistics with inherent reporting disparities across national boundaries.

III. PRINCIPAL FINDINGS

A. ECONOMIC UPGRADING

The decade analyzed experienced a significant increase in world exports. Mexico followed that trend, but its dynamism was below the world average (see Table 1). Much of the drop in Mexico's share of the world market should be interpreted as a loss to new global powers in world trade such as China, whose total export value grew from less than that of Mexico to more than three times the value of Mexico's exports from 1999-2008, with an export profile which was worryingly similar to that of Mexico (Hanson, 2010). As we can see in table 1, this inability to keep pace with global market growth negatively skews Mexico's market participation. In terms of weighted unit value growth, Mexico experienced positive movement in the unit value of its mining and tourism sectors, indicating what can be considered movements into higher-value added activities. The increase in unit value of the mining sector may be understood as the effect of the increase in world oil prices that occurred during the 2000's and the importance of the oil sector within the Mexican mining industry.

TABLE 1
MEXICO: WORLD EXPORTS, MARKET SHARE AND UNIT VALUE GROWTH, 1999-2008
(Annualized percentage growth)

Sector	World: Real Export Growth	Mexico: Real Export Value Growth	Mexico: Export Market Share Growth	Mexico: Weighted Unit Value Growth
Agriculture	4.9	-4.2	-8.6	-5.1
Manufacturing ^a	4.7	1.4	-3.1	-2.5
Mining	15.8	13.7	-1.8	14.5 ^b
Tourism ^c	5.7	5.2	-0.4	5.6

Source: Own elaboration based on UN Comtrade database.

^a Trademap: Average variation of the sum of the subsectors: Foods and beverage, medical devices, automotive and textile.

^b Includes data from US EIA.

^c World Bank WDI.

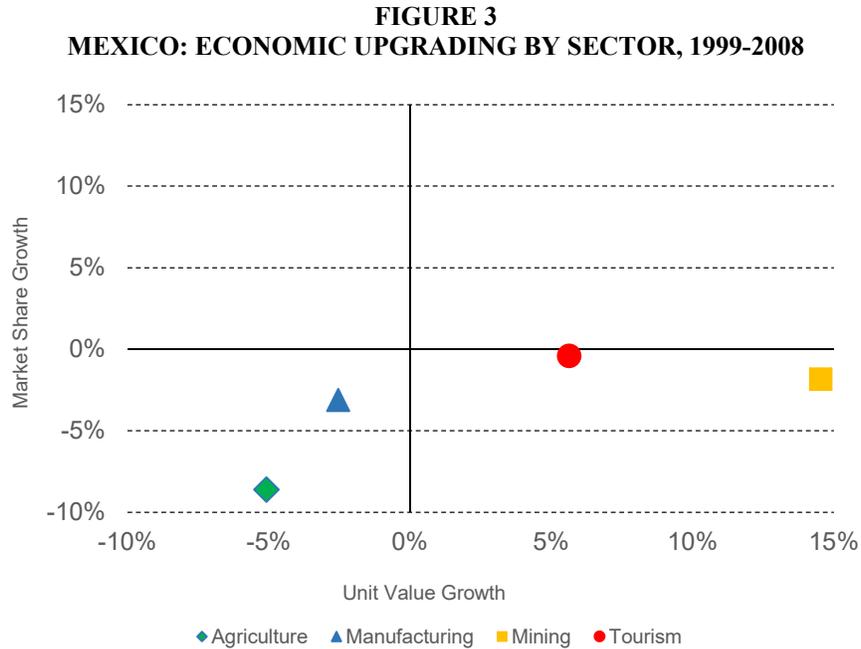
The analysis of productivity yields very different results. While export market participation growth is negative for Mexico during the given time period, table 2 shows that labor productivity for all sectors is positive. Productivity growth in sectors such as tourism is highly positive for men (7%) as well as women (17.7%). Male productivity growth outpaced female productivity growth in the agricultural, manufacturing, and mining sectors.

TABLE 2
MEXICO: LABOR PRODUCTIVITY AND UNIT VALUE GROWTH, 1999-2008
(In percentages)

Sector	Labor Productivity Growth			Weighted Unit Value Growth
	Men	Women	Total	
Agriculture	9.5	1.0	10.5	-5.1
Manufacturing	5.3	4.4	9.7	-2.5
Mining	10.7	3.2	13.9	-0.2
Tourism	7.0	17.7	24.7	5.6

Source: Own elaboration based on data from UN Comtrade, US EIA, and World Bank WDI.

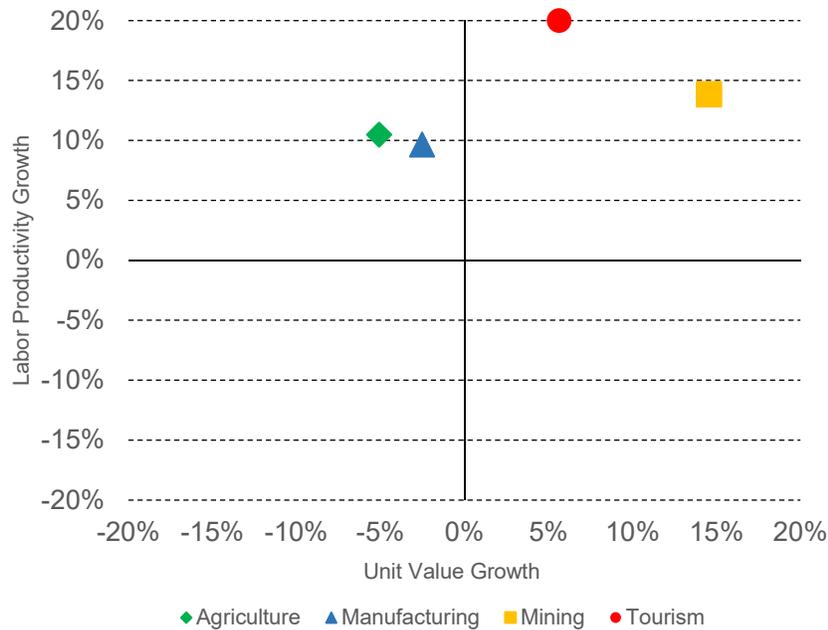
Figure 3 shows the results for economic upgrading by sector under the export-oriented approach. Among all the sectors, tourism appears to experience the best performance, as it is closest to unambiguous economic upgrading. Mining performs well in terms of unit value growth, however this result might be influenced by the period of high world oil prices. Also, the fact that the mining sector lost market share may imply an inability to increase production in response to increased demand. Agriculture and manufacture exhibit negative unit value growth as well as market share loss, and thus experience economic downgrading.



Source: Own elaboration based on data from UN Comtrade, US EIA, and World Bank WDI.

Utilizing productivity data in place of export market share provides different conclusions. Whereas under the export-oriented approach there were no sectors that experienced unambiguous economic upgrading, both the tourism and mining sectors experienced economic upgrading under the modified productivity approach (see figure 4). Both the agricultural and manufacturing sectors move from experiencing unambiguous economic downgrading to a more ambiguous position in the upper left quadrant of the graph. Manufacturing and agriculture experienced gains in terms of labor productivity, however they did not imply higher value on its exports. If this matrix is understood as a way to imply the amount of economic upgrading, the intuitive result is that there has been more economic upgrading in the productivity vs exports approach than in the merely export oriented one. Thus, moving to an analysis featuring productivity results in a more positive portrayal of each of the economic sectors.

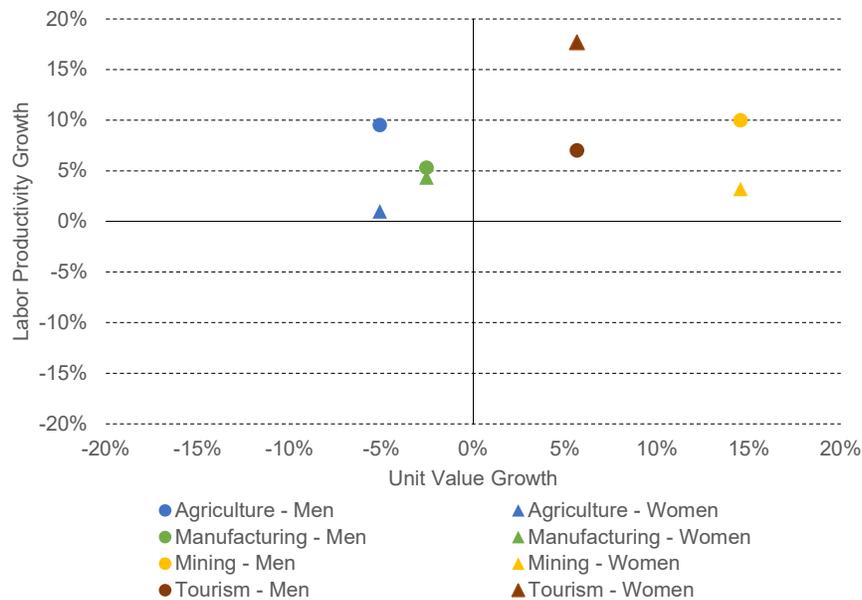
FIGURE 4
MEXICO: ECONOMIC UPGRADING WITH PRODUCTIVITY, 1999-2008



Source: Own elaboration based on data from UN Comtrade, US EIA, INEGI, and World Bank WDI.

The data available allows for separating the analysis of labor productivity by gender. By doing so, a more detailed view of the underlying movements of economic upgrading is provided. Figure 5 presents a comparison of the productivity gains of women and men in all four sectors analyzed. The mining and agricultural sectors saw substantially greater productivity gains for men than for women. One possible explanation for this is the idea of “occupational segmentation.” Under this framework, capital investments are directed at the male segment of the labor force, while women remain in lower-productivity jobs within the sector (Tejani and Milberg, 2010). As increasingly mechanized and technology-intensive industries, mining and agriculture would seem especially vulnerable to occupational segmentation. However, female productivity growth in the tourism sector drastically outpaced male productivity growth. This gender disparity in productivity growth in the tourism sector merits further research.

FIGURE 5
MEXICO: ECONOMIC UPGRADING WITH PRODUCTIVITY AND GENDER, 1999-2008



Source: Own elaboration based on data from UN Comtrade, US EIA, INEGI, and World Bank WDI.

B. SOCIAL UPGRADING: GAINS IN WAGE AND EMPLOYMENT AND A GENDER VIEW

With regard to social upgrading, results show (see table 3) a decade that featured general growth in terms of real wage and employment across the sectors, with few exceptions. The intensity of the growth varied depending on the sector, with agriculture the most dynamic in terms of real wage growth (3.7%) followed by manufacturing (2.4%), tourism (1.9%) and mining (0.9%). Tourism was, however, the most dynamic sector in terms of creating employment (6.2%), followed by mining (5%) and manufacturing (0.1%), which also registered growth. In contrast, the agricultural sector recorded a decline of 1.1%.

The results by gender, however, show different outcomes. The sector that experienced highest growth for both real wages and employment for women was mining. The decline of agricultural employment was more intense for women (-1.9%) than for men (-1%). Aside from agriculture, women experienced larger gains in employment rates across all sectors. In terms of real wages, all the sectors registered positive growth. Finally, the gains obtained by women tended to be higher than the ones obtained by men, which can be a reflection of the historically unequal access of women to labor markets in the form of lower wages and less participation of the labor force. High levels of employment growth in tourism are especially impressive given the relative gender parity of employment in this sector. In 1999, women accounted for roughly 45% of formal employment in the tourism sector, compared to less than 10% in the agricultural sector. The base level of female employment in the mining sector was also roughly 10% of the total labor force. Registering 8% annualized growth in female employment in this sector shows the possibility of a “catching up” effect.

TABLE 3
MEXICO: REAL WAGES AND EMPLOYMENT GROWTH, 1999-2008
(MEN AND WOMEN)

(In percentages)

Sector	Real Wage Growth			Employment Growth		
	Men	Women	Total	Men	Women	Total
Agriculture	3.8	2.8	3.7	-1.0	-1.9	-1.1
Manufacturing	2.4	2.8	2.4	-0.2	0.7	0.1
Mining	0.6	4.4	0.9	4.6	8.0	5.0
Tourism	1.5	3.2	1.9	4.6	8.0	6.2

Source: Own elaboration based on data from ILO LABORSTA.

Figure 6 presents a visualization of the results for social upgrading for the sectors analyzed. Tourism and mining register unambiguous social upgrading, experiencing growth in terms of employment and real wage. Manufacturing seems to be on the edge between unambiguous and ambiguous social upgrading, experiencing real wage growth but almost no growth in terms of employment. On the other hand, agriculture notes partial social upgrading as it experienced wage growth combined with a decrease in employment. The findings for agriculture are consistent with theories arguing that total factor productivity lead to decreasing employment in the agricultural sector (Kuznets, 1957). A diminished labor supply, according to neoclassical theory, would also lead to increased wages for agricultural workers, which we also find to be true in the case of Mexico.

FIGURE 6
MEXICO: SOCIAL UPGRADING, 1999-2008



Source: Own elaboration based on data from ILO LABORSTA.

Figure 7 illustrates the gender effects in social upgrading. Social upgrading of women outpaced that of men in all sectors except agriculture, which experienced employment losses for both men and women. The variation in employment levels show greater gains for women when total results are positive

and significantly worse losses when results are negative. For example, the mining sector registered 5% growth in total employment, with employment growth for women (8%) almost doubling that of men (4.6%).

FIGURE 7
MEXICO: SOCIAL UPGRADING BY GENDER, 1999-2008



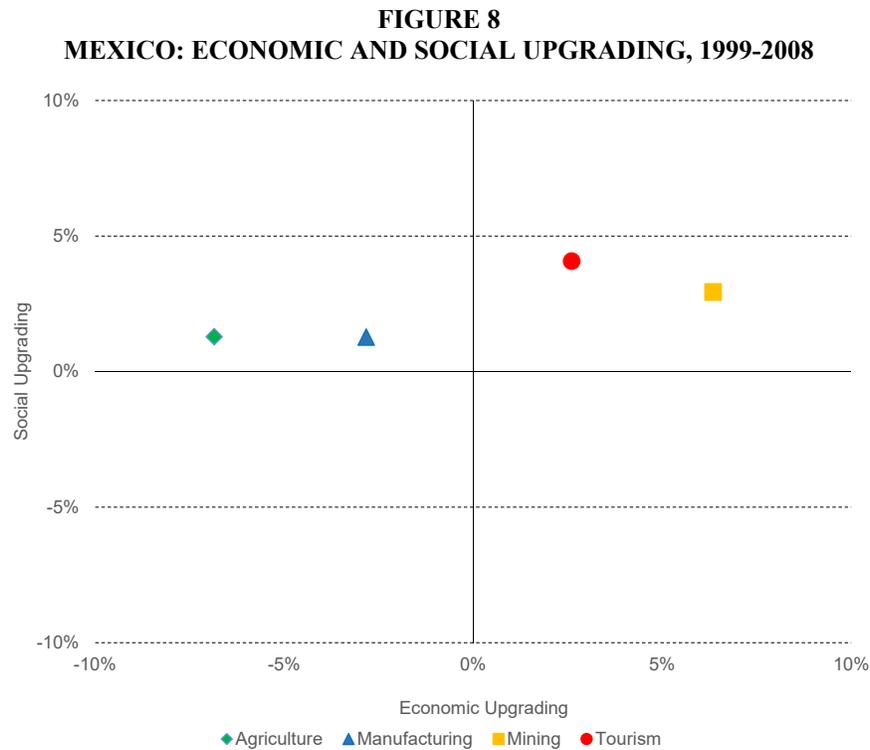
Source: Own elaboration based on data from ILO LABORSTA.

Almost identical results are seen in the tourism sector, and are even more apparent in manufacturing, where women captured all of the employment gains (0.7%) while men registered negative employment growth (-0.2%). The agricultural sector, however, saw women perform worse than men in terms of both wage and employment losses. These findings lend support to the idea that economic upgrading represents both an opportunity and a great risk for women in terms of social upgrading (Christian, Evers and Barrientos, 2013).

Disparities in initial total employment levels could factor in the analysis of these results. In both the agricultural and mining sectors, employment levels at the beginning of our analysis were around ten times greater for men than for women. Despite this fact, female employment in the manufacturing sector rose while male employment fell, even with female labor force participation rates significantly higher than other sectors. The wage convergence based on gender represents an encouraging development, although initial wage disparity makes the prospect of gender equality in wages remote. Convergence of wages in the mining and tourism sectors are especially encouraging, as initial female wages represented only 71% and 63% of male wages, respectively. The exception to this idea is the agricultural sector, where female initial wages were higher than male wages, although the initial wage differential was negligible.

C. OVERALL VIEW

Graphic representation of the combined economic and social parsimonious indicators described above provides a sense of the sectoral shifts experienced in the Mexican economy during the period under study. Using the traditional approach, Figure 8 shows that international tourism experienced unambiguous economic and social upgrading. Manufacturing, mining and agriculture experienced only partial upgrading due to lackluster economic performance.

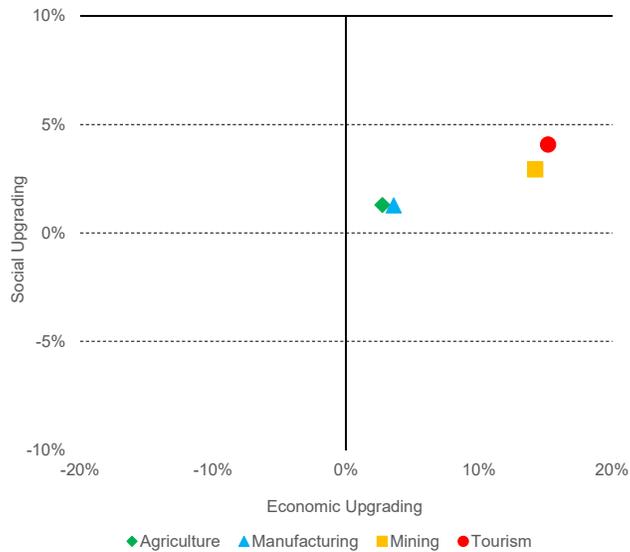


Source: Own elaboration based on data from ILO LABORSTA, UN Comtrade, US EIA, and World Bank WDI.

The borderline performance of some sectors on social indicators represented significant employment cuts being counteracted by wage gains. In contrast to traditional thought regarding economic and social upgrading, the results displayed in Mexico under the parsimonious approach of Bernhardt and Milberg would seem to display economic downgrading paired with social upgrading. This finding would contradict the current literature stating that economic upgrading is a necessary condition for the existence of social upgrading.

The modified approach elaborated for this work again paints a different picture of Mexican social and economic upgrading performance. Figure 9 shows the combination of economic and social upgrading variables including productivity, yielding results showing unambiguous social and economic upgrading for all analyzed sectors. While the agricultural and mining sectors experienced only slight economic and social upgrading, the mining and tourism sectors experienced slightly greater upgrading. All sectors, however, experienced greater economic upgrading than social upgrading as measured under this approach.

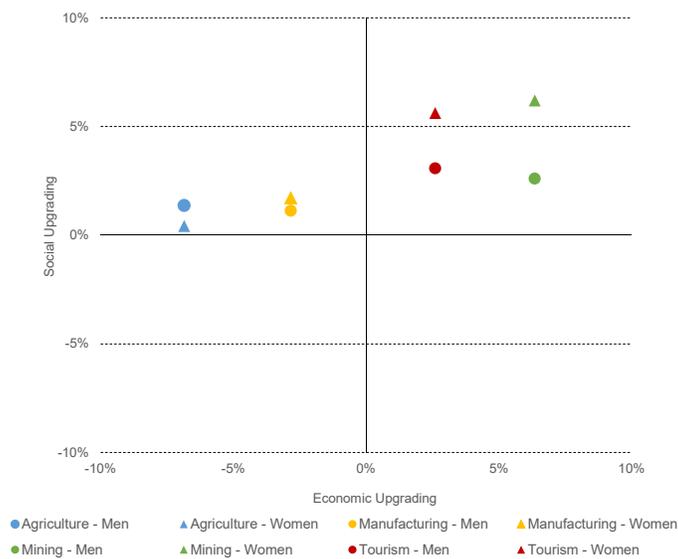
FIGURE 9
MEXICO: ECONOMIC AND SOCIAL UPGRADING USING LABOR PRODUCTIVITY, 1999-2008



Source: Own elaboration based on data from ILO LABORSTA, UN Comtrade, US EIA, INEGI and World Bank WDI.

Figure 10 shows the disaggregated results by gender under the traditional approach. This analysis again shows mixed results for the manufacturing and agriculture sectors, with little variation in social upgrading results by gender. Women in the tourism and mining sectors, in contrast, captured substantially larger social gains than their male counterparts. As previously noted, this is partially influenced by substantial increases in female employment in these sectors paired with some convergence in wages (INEGI, 2015).

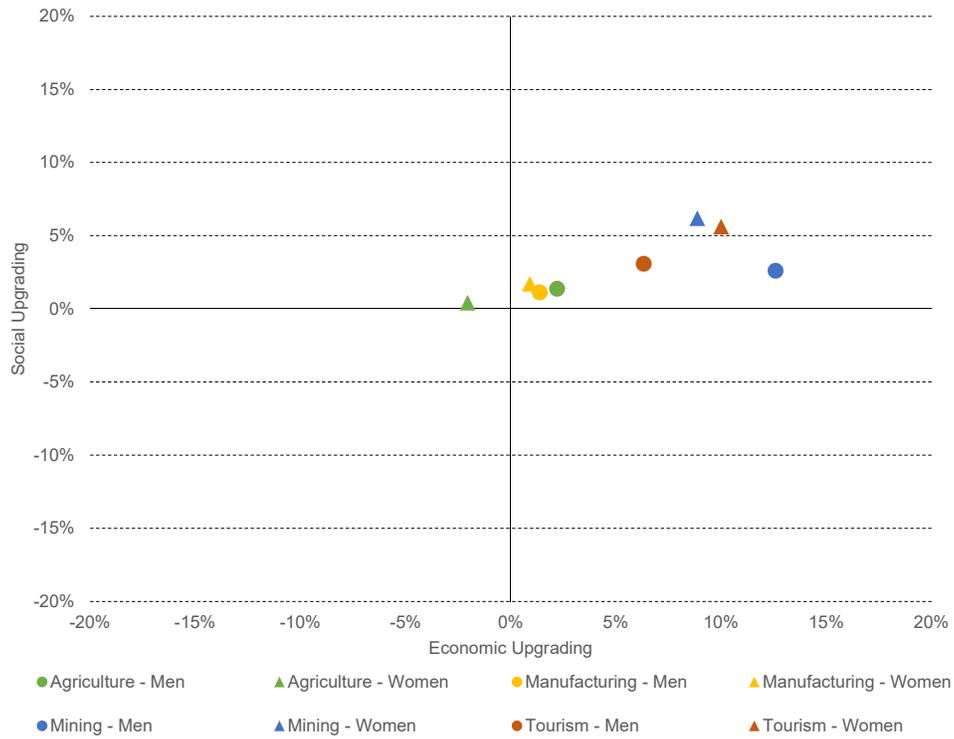
FIGURE 10
MEXICO: ECONOMIC AND SOCIAL UPGRADING BY GENDER, 1999-2008



Source: Own elaboration based on data from INEGI, UN Comtrade, US EIA, and World Bank WDI.

Using the modified approach which includes productivity data in its analysis gives a much more dynamic view of the changes in the Mexican economy. Not only are all but one data point shifted into the unambiguous upgrading quadrant, but movement is also experienced across both dimensions. Thus in figure 11 we note that women in the tourism sector experienced both greater social and economic upgrading than their male counterparts, whereas in the mining sector women also gained more in terms of social upgrading, but were outdone by their male counterparts in terms of economic upgrading.

FIGURE 11
MEXICO: ECONOMIC AND SOCIAL UPGRADING
BY GENDER USING PRODUCTIVITY, 1999-2008



Source: Own elaboration based on data from INEGI, UN Comtrade, US EIA, and World Bank WDI.

IV. CONCLUSION

This work builds upon Bernhardt and Milberg's parsimonious approach based on the performance of the external sector. The results of this initial approach for Mexico show a dreary picture of Mexican economic upgrading, however pair those findings with social upgrading. These findings run counter to current thought regarding the necessary condition of economic upgrading in route to social upgrading. As a contrast to these results, this work also adds a modification to the Bernhardt and Milberg analysis, utilizing measurement of the national productivity and social upgrading. The inclusion of productivity in this analysis responds to the need capture information on labor and production evolution in the whole economy, regardless of the external sector performance. This refinement shows the stark distinction between the results of these two approaches when analyzing the economy of Mexico. Utilizing internal productivity in the analysis of economic and social upgrading instead of externally-dependent factors creates a depiction of the Mexican economy more in line with the literature regarding economic upgrading as a necessary but not sufficient condition for social upgrading.

Results of this comparative analysis vary by sector. The performance of the agricultural sector in Mexico must be viewed in a grim light. Mexican agricultural export market share and unit value declined along with total employment in the sector. Women in the agricultural sector are the only "ambiguous" subjects of our analysis not to move to definitive upgrading under the new framework of analysis. Slight gains in wages and productivity somewhat offset losses to employment, however.

Gender effects in the case of Mexico are of particular interest. For all of the analyzed sectors except agriculture, women saw greater increases in wages and employment. While this finding is encouraging, women's share of productivity growth was lower than that of men for all sectors except tourism. This result may confirm the existence of occupational segmentation, although further research into these sectors as well as the dominance of female productivity growth in the tourism industry merit further investigation.

The image of the Mexican economy and the conclusions regarding economic and social upgrading differ according to the approach taken. A view based solely on the performance of the external sector gives the impression that social upgrading is being achieved in a context of economic downgrading. An approach that places focus on national productivity provides insight more tailored to the economy of Mexico, painting a slightly more positive picture and seemingly better reflecting the realities of the Mexican economy. These contradictory results can therefore mislead economic development policy makers and divert resources from better targeted policies.

Increased participation into GVCs is becoming one of the top priorities in many economic development strategies across the world. While the benefits at the micro level (value chain level) can be substantial, wider effects in the economic structure and relationships with social upgrading are not clearly and unambiguously identified yet, appearing to be very context dependent. Better understanding of the relationship between economic upgrading and social upgrading is the basis for designing better public policies that contribute to achieve sustained economic and social progress.

In doing so, new methods and recollection of data are needed to capture the reality of GVCs and their impact on salaries, level of employment and productivity. The growing literature regarding the links between economic and social upgrading reflects the increasing importance of the analysis of income distribution and social policy. With growing emphasis being placed on inclusive growth, understanding the links between socially inclusive growth and economic competitiveness and productivity is more important than ever. Nonetheless the issue of enabling rights and other aspects of social welfare such as gender equality and environmental rights require attention in order to generate policies that cover social progress in its multidimensional aspects.

The analysis of GVCs has grown and gained sophistication in the last recent years. This work explores new methods and data to incorporate into this analysis the impact of GVC's on welfare. The methodological proposal places emphasis on the relevance of including labor productivity in the analysis of economic upgrading, since it captures the performance of all sectors and not only those linked to the external sector, as would be the case using market share data. In addition, to analyze social upgrading, focus is placed on the evolution of wages and employment. The case of Mexico sheds light on the importance of including relevant labor productivity into the analysis since results change substantially with regards to the analysis that solely focused on exports performance (market share data).

Using Bernhart and Millberg's methodology in the case of Mexico, social but not economic upgrading is found, which contradicts general understandings on the relationship between the two concepts. However, by using productivity in the analysis, as proposed in this work, different results are found: both economic and social upgrading are taking place simultaneously in Mexico, which affirms the views presented in the supporting literature.

This work provides a methodological approach for deepening the analysis of economic performance and especially for the analysis of value chain upgrading. Though the social upgrading analysis can be sophisticated and more variables can be included, in order to facilitate its replication in developing countries where data are scarce, it is considered that labor productivity, wages and employment provide relevant information to analyze economic and social upgrading.

Finally, conceptualization of social upgrading has different approaches, from views based on income and employment to more sophisticated multidimensional visions. While a comprehensive and easily measurable concept is still a challenge, this analysis suggests that a concept of social upgrading in line with the 2030 agenda must have at least the following components: Employment –measured in numeric and quality terms–, gender –female participation– and environment –use of natural resources and/or emissions. How to operationalize these components into measurable indicators that are comparable across countries is not an easy task, as proven by the ongoing debate about how to measure poverty. Solving this debate will require high doses of academic and political dialogue as well as technical assistance under both the classic paradigm north-south and renovated schemes of south-south and triangular cooperation.

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ANNEX 1

SOURCES AND COMPOSITION OF SECTORS

Indicator	Agriculture	Manufacturing	Mining	Tourism
Export value and market share (All information from UN Comtrade, unless otherwise stated)	Sum of SITC 0 + SITC 21 + SITC 22 + SITC 24 + SITC 261 + SITC 263 + SITC 264 + SITC 265 + SITC 268 + SITC 29 + SITC 4	Sum of SITC 5 + SITC 6 (except SITC 68) + SITC 7 + SITC 8	Sum of SITC 28 + SITC 68 + SITC 274 + SITC 277 + SITC 278 + SITC 32 + SITC 33 + SITC 34	“International tourism, expenditures (current US\$)” (from the World Bank WDI, adjusted for inflation)
Export unit value (All information from UN Comtrade, unless otherwise stated)	Weighted basket of SITC 263, SITC 265, SITC 268	Due to data limitations and the complexity of world manufacturing sector, real total export value for manufactures was used in place of unit value	Weighted basket of SITC 274, SITC 277, SITC 278, Brent Spot Price (from the US Energy Information Administration)	Division of “International Tourism, expenditures (current US\$)” and “International tourism, number of arrivals” (from the World Bank WDI, adjusted for inflation)
Labor Productivity (All data from INEGI)	“Contribución del servicio laboral por sexo, edad y nivel de escolaridad, al crecimiento económico” – “Sector 11: Agricultura, cría y explotación de animales, aprovechamiento forestal, pesca y caza”	“Contribución del servicio laboral por sexo, edad y nivel de escolaridad, al crecimiento económico” – “Sectores 31-33: Industrias manufactureras”	“Contribución del servicio laboral por sexo, edad y nivel de escolaridad, al crecimiento económico” – “Sector 21: Minería”	“Contribución del servicio laboral por sexo, edad y nivel de escolaridad, al crecimiento económico” – “Sector 72: Servicios de alojamiento temporal y de preparación de alimentos y bebidas”
Employment	“Total employment, by economic activity” (from LABORSTA, ISIC-Rev.3)	“Total employment, by economic activity” (from LABORSTA, ISIC-Rev.3)	“Total employment, by economic activity” (from LABORSTA, ISIC-Rev.3)	“Total employment, by economic activity” (from LABORSTA, ISIC-Rev.3)
Wages	“Paid employment, by economic activity” (from LABORSTA, ISIC-Rev.3)	“Paid employment, by economic activity” (from LABORSTA, ISIC-Rev.3)	“Paid employment, by economic activity” (from LABORSTA, ISIC-Rev.3)	“Paid employment, by economic activity” (from LABORSTA, ISIC-Rev.3)

Source: UN Comtrade, ILO LABORSTA, World Bank WDI, US EIA, INEGI.



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