

CAPTURING THE GAINS



*economic and social upgrading
in global production networks*

Economic and Social Upgrading in Global Production Networks: Problems of Theory and Measurement

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Abstract

The massive globalization of production led by large firms in industrialized countries, combined with the policy shift in developing countries toward export-oriented growth, has meant that economic development has increasingly become synonymous with “economic upgrading” within global production networks (GPNs), that is, moving into higher productivity and higher value-added aspects of production and export. There is much research on economic upgrading in global production networks, connecting economic growth and economic upgrading to international trade performance. There has been less analysis of what such upgrading means for living standards, including wages, work conditions, economic rights, gender equality and economic security. In this paper, we refer to improvements in these aspects of economic and social life as “social upgrading”. This paper reviews the ways in which economic and social upgrading in GPNs are measured. In this paper we focus mainly on developing countries. In the process we also scrutinize the theoretical connection between these two dimensions of upgrading within GPNs.

Keywords: globalization, social upgrading, economic upgrading, gender, wages, living standards.

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1. Introduction

The massive globalization of production led by large firms in industrialized countries, combined with the policy shift in developing countries toward export-oriented growth, has meant that economic development has increasingly become synonymous with “economic upgrading” within global production networks (GPNs), that is, moving into higher productivity and higher value-added aspects of production and export. There is much research on economic upgrading in global production networks, connecting economic growth and economic upgrading to international trade performance. There has been less analysis of what such upgrading means for living standards, including wages, work conditions, economic rights, gender equality and economic security. In this paper, we refer to improvements in these aspects of economic and social life as “social upgrading”. This paper reviews the ways in which economic and social upgrading in GPNs are measured. In this paper we focus mainly on developing countries. In the process we also scrutinize the theoretical connection between these two dimensions of upgrading within GPNs.

The global production network – defined by Sturgeon (2001) as “a set of interfirm relationships that bind a group of firms into a larger economic unit” – has proven to be a powerful device for study of economic upgrading because it has been found to be the context in which firms have raised their productive capabilities, especially through learning from relations with buyers as these supplier firms seek to attain internationally competitive goods and services. Regarding the great increase in some developing country firms’ industrial performance in the 1990s, a UNIDO report noted that “the main cause of the large upward leaps appears to be participation in integrated GPNs, which sharply raises the share of complex products in exports” (UNIDO, 2002, p. 42).

Economic upgrading – often referred to as “industrial upgrading” or simply “upgrading” – is typically defined as the ability of producers “to make better products, to make products more efficiently, or to move into more skilled activities” (Pietrobelli and Rabellotti, 2006, p. 1). The focus of most studies of upgrading is on the degree of technological sophistication of production and especially on value added. In the terminology of global value chains (GVCs), upgrading is defined as “the possibility for (developing country) producers to move up the value chain, either by shifting to more rewarding functional positions or by making products that have more value added invested in them and that can provide better returns to producers” (Gibbon and Ponte, 2005, p. 87-88). Humphrey (2004) and Humphrey and Schmitz (2002) identify various distinct types of economic upgrading, including process upgrading, product upgrading, functional upgrading and intersectoral upgrading. Work by Gereffi (1999) documents process upgrading in the apparel sector, but most case study work has been on functional upgrading, that is the move into more technologically sophisticated or more integrated aspects of a given production process.

Economic upgrading (and especially functional upgrading that is the focus of most value chain research) may be hard to quantify, but nonetheless seems to be one of those things that “you know it when you see it”. The key steps in the functional upgrading process have been identified as the move from assembly to original equipment manufacture to original design manufacture and to original brand manufacture.¹ Quantification might be helpful, however, 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. These are hard questions to answer without agreed-upon quantitative measures of upgrading. Measurement will also help to formulate and assess policies intended to improve social upgrading relative to economic upgrading.

¹ See Humphrey (2004) for an overview.

² See, for example, Amsden (1989) on Korea’s high-road strategy, Kaplinsky (1993) on the export processing zone-led

The concept of social upgrading captures gains in living standards and work conditions over time. The most basic expressions of this are employment and pay. Then are issues of labor conditions. There are competing economic theories of wage determination and the differences are important for our understanding of the relation between economic and social upgrading. In neoclassical theory, labor demand and thus wages are largely determined by technology. This connects economic to social upgrading. In institutionalist theory, wages are the outcome of a bargaining process that will be determined by relative strength on the two sides and with labor market institutions (e.g. minimum wages, union bargaining protections) as significant in determining the outcome. In such a context, social upgrading is delinked from technological change per se and associated also with social institutions.

If there is a possibility of social upgrading, is there also a possibility of downgrading? If international competitiveness depends in part on production costs, then there are two routes to raising international competitiveness: lower the payment to factors of production (in particular, labor and capital) or raise productivity. Leaving capital costs aside, we can simplify the issue as between lowering wages and raising labor productivity. There are limits to the low-road strategy of lowering wages (social downgrading, in our framework) based on considerations of political stability and mere human subsistence. Nonetheless, downgrading is a distinct possibility, and our measure of economic upgrading must be able to account for both the low and the high-road to be associated with improved export performance.²

In theory, there are four combinations of economic and social development, as illustrated in Figure 1. Economic upgrading may be combined with social upgrading or downgrading. And it is possible for social upgrading to occur in the absence of economic upgrading as well as for a country to experience simultaneous “downgrading” in economic and social terms.³ There have been massive amounts of research on upgrading, although some of this analysis does not identify itself as being about upgrading, but rather about trade, investment, productivity, industrialization, wages, labor standards and gender. Despite the variety of the research, coming from a number of different social science disciplines, there is nonetheless considerable agreement about the definitions of upgrading and there are hundreds of case studies of particular production networks and the degree and nature of upgrading in developing countries.

² See, for example, Amsden (1989) on Korea’s high-road strategy, Kaplinsky (1993) on the export processing zone-led low-road strategy in the Dominican Republic and Moreno-Brid et al. (2005) on the low-road path of Mexican export growth after the implementation of NAFTA.

³ Stefano Micelli has noted in discussion that over the long run, only two quadrants in Figure 1 are sustainable. The upgrading/upgrading quadrant is the virtuous cycle where economic upgrading support social upgrade. The downgrading/downgrading quadrant is the vicious cycle where economic downgrading can only support social downgrading. This implies that the question is less if economic upgrading generates social upgrading, but how long the process takes.

Figure 1: Economic and social upgrading

		Social Realm	
		Upgrading	Downgrading
Economic Realm	Upgrading	<i>High-road growth</i>	<i>Low-road growth</i>
	Downgrading	<i>High-road decline</i>	<i>Low-road decline</i>

Source: Own illustration.

The presumption in the literature is that economic upgrading brings both improved export performance and social upgrading. Below we analyze an international sample of developing countries showing that while trade performance and economic upgrading are strongly positively correlated, the link between economic upgrading and social upgrading is much less tight. This is an important point since it indicates the need for an improved understanding of the connection. The paper has five sections. In section two we introduce measures of the globalization of production. In section three we survey the dominant methods used to measure economic and social upgrading. Section four presents some cross-national evidence from a sample of 30 developing countries. And in section five we consider briefly the implications for policy and for future research.

2. Measuring the globalization of production

The growth in developing countries' exports of manufacturers since 1980 is impressive, explosive in some cases, such as Mexico, Brazil, China and India (see Table 1). Much of this trade expansion has occurred within the framework of GPNs rather than through more traditional, arm's-length channels described by international competition in markets for final goods and services. Yi (2003) calculates that 50% of the growth in U.S. trade over the period 1962-1997 was due to "vertical specialization", that is "the amount of imports embodied in goods that are exported". A series of recent studies of Chinese trade finds that vertical specialization accounted for 35-40% of the growth of China's trade in the period 1992-2003, with very rapid growth in vertical specialization in the 2000s, exceeding 50% of trade in some sectors.⁴

⁴ ILO (2008) p. 8.

Table 1: Developing countries' exports of goods 1980-2006

Country	Exports of Goods							
	value in millions of US\$ at current prices				compound annual growth rate			
	1980	1990	2000	2006	1980-90	1990-00	2000-06	1980-06
<i>All Developing Countries</i>	597,574	843,904	2,056,172	4,497,118	3.5%	9.3%	13.9%	8.1%
Brazil	20,132	31,414	55,086	137,807	4.5%	5.8%	16.5%	7.7%
China	18,099	62,091	249,203	969,380	13.1%	14.9%	25.4%	16.5%
India	8,586	17,969	42,379	120,265	7.7%	9.0%	19.0%	10.7%
Mexico	18,031	40,711	166,367	250,441	8.5%	15.1%	7.1%	10.6%

Source: Own illustration. Data: UNCTAD Handbook of Statistics.

The globalization of production can also be seen in the data on offshoring by developed countries. Materials and services offshoring, measured as the amount of imported inputs in total non-energy inputs, rose through the 1990s, with materials offshoring accounting for almost 30% of input use in the U.K., 23% in Germany and over 17% in the U.S. In the cases of Germany and the U.S., these levels reflect slow but steady growth in the reliance on imported inputs of materials, growing about 50% over the ten-year periods considered. For services, the range is much lower (between 0.8 and 3%, but the rates of growth are, for all three countries, higher than for materials offshoring.⁵ As a number of recent studies indicate, services offshoring is likely to continue to expand more rapidly than that of materials in the years to come.⁶

We see in Table 2 that Japan and the U.S. now rely heavily on goods imports from low-income developing countries (29% and 23% respectively). While the European countries are at much lower levels, all countries have seen more than a doubling of the share of their imports coming from low-income developing countries since 1991 (see CAGR). However, offshore destinations also include developing countries with a higher income level, such as Mexico, Brazil or South Africa. Thus the broad measure of goods offshoring shows that developing country imports constitute over half of total imports by Japan (68%) and the U.S. (54%), while the European countries range from 23% in the U.K to only 13% in Denmark.⁷

⁵ For details on offshoring trends, see Milberg and Winkler (2009), Chapter 2.

⁶ See Blinder (2007) for estimates.

⁷ The relevant economic groupings of developing countries according to the UNCTAD can be found here: http://www.unctad.org/sections/stats/docs//gds_csirb_c&td-2-9_en.pdf.

Table 2: Trade and offshoring, selected countries, 1991-2005/06

<i>Measure</i>		Denmark	France	Germany	Japan	United Kingdom	United States
<i>(Exports plus Imports)/GDP</i>	1991	71.7%	44.2%	51.9%	18.5%	47.1%	20.5%
	2005	92.8%	53.0%	76.7%	27.3%	56.5%	26.9%
	CAGR	1.9%	1.3%	2.8%	2.8%	1.3%	2.0%
<i>Balance of Goods (in % of GDP)</i>	1991	2.5%	-1.4%	0.8%	2.3%	-2.7%	-1.5%
	2005	3.2%	-2.0%	7.2%	1.7%	-6.0%	-6.6%
<i>Balance of Services (in % of GDP)</i>	1991	2.8%	1.3%	-1.4%	-1.2%	0.7%	0.7%
	2005	1.1%*	0.5%	-1.7%	-0.5%	1.9%	0.5%
<i>Goods Offshoring Intensity (Narrow Measure)</i>	1991	2.9%	3.8%	4.1%	14.9%	3.0%	8.6%
	2006	6.5%	6.3%	8.2%	29.1%	8.2%	23.1%
	CAGR	5.4%	3.4%	4.7%	4.5%	7.0%	6.8%
<i>Goods Offshoring Intensity (Broad Measure)</i>	1991	9.0%	15.2%	14.6%	49.3%	14.1%	40.1%
	2006	13.1%	16.4%	17.0%	68.2%	22.8%	54.1%
	CAGR	2.5%	0.5%	1.0%	2.2%	3.3%	2.0%
<i>Services Offshoring Intensity (Narrow Measure)</i>	1991	23.1%	13.0%	20.0%	29.2%	13.7%	10.4%
	2006	20.0%	28.0%	26.1%	24.3%	22.6%	18.6%
	CAGR	-1.0%	5.2%	1.8%	-1.2%	3.4%	4.0%
<i>Services Offshoring Intensity (Broad Measure)</i>	1991	23.1%	24.7%	22.1%	31.6%	17.7%	18.6%
	2006	22.3%	33.4%	31.6%	27.0%	32.9%	22.6%
	CAGR	-0.2%	2.0%	2.4%	-1.0%	4.2%	1.3%

Data sources: OECD International Trade by Commodities Statistics, IMF Balance of Payments Statistics, UNCTAD Handbook of Statistics. *2004 data for Denmark. NB: See text for offshoring variable definitions.

Japan and the U.S. now rely heavily on imports from low-income developing countries (29% and 22% respectively). While the European countries are at much lower levels, all countries have seen more than a doubling of the share of their imports coming from low-income developing countries since 1991. Although offshoring has a long history (for example, according to Hamilton et al. (2006), the creation of Asian suppliers for large U.S. retail firms began in the late 1960s) it was in the 1990s that managing the global supply chain became in itself an important “strategic asset” for U.S. companies in their competition with low-cost and flexible Japan and increasingly innovative Europe.⁸ In the last ten years, Japanese producers and European firms have developed highly sophisticated GPNs, both for producers and for retailers.

Since services import data by regions are not available for our relevant time period, we cannot derive similar measures as for goods offshoring. We use the following measure of services offshoring intensity

$$OSS_{it}^{narrow} = (\text{Services Imports})_{it}^{narrow} / (\text{Services Imports})_{it}^{total} \quad (1a)$$

$$OSS_{it}^{broad} = (\text{Services Imports})_{it}^{broad} / (\text{Services Imports})_{it}^{total} \quad (1b)$$

where i designates countries and t years. Equation (1a) is defined as a country's import share of ‘computer and information services’ plus ‘other business services’ in total services imports. Equation (1b) additionally takes ‘communication services’ and ‘financial services’ into account. In Table 4 we see that Japan and Denmark saw a small decline in services offshoring between 1991

⁸ Lynn (2005), p. 123.

and 2006, while the other countries experienced compound annual growth rates of services offshoring of between 1.3% and 5.2%.

3. Measuring upgrading in global production networks

Most of the massive amounts of research done on upgrading in GPNs has been the study of individual cases of countries or sectors organized in global networks. Case studies bring a deeper understanding of the process of upgrading, the role of each of the key actors in the process and the obstacles that upgrading firms face in GVCs. There are some general patterns in the case study literature. Economic upgrading is usually measured by changes in export volume or export unit value. Social upgrading is usually captured by employment or wages. These studies provide invaluable local detail and context for understanding the conditions under which upgrading occurs. They generally emphasize one aspect of upgrading not both. And the cases are often about success stories, indicating a selection bias problem that would skew any generalizations one might draw from the overall literature. In addition to the rich, sector-based, case study GVC research, there are two other important methodological approaches to the study of upgrading and trade: accounting (section 3.1) and econometrics (section 3.2). Section 3.3 will focus on measures of economic and social upgrading and on their comparability.

3.1 Accounting for upgrading

Economic upgrading has been operationalized mainly through notions of productivity growth, international competitiveness and unit prices. But a closer look at the precise definitions of these concepts reveals potential ambiguity in relating them to social upgrading. Labor productivity is measured as output Q per worker L .

$$\Pi = Q/L \tag{2}$$

Thus growth in labor productivity also has two components, the growth in output and the growth in employment \hat{L} :

$$\hat{A} = \hat{Q} - \hat{L}. \tag{3}$$

Rearranging (3) gives:

$$\hat{Q} = \hat{A} + \hat{L}. \tag{4}$$

Pieper (2000) building on Kaldor (1954), defines positive productivity growth greater than 3% per annum as “economic sustainability” and greater than 3% growth in employment as “social sustainability.” She measures these for a large sample of developing countries and finds unsustainable outcomes in many African and Latin American countries, and sustainable outcomes in many of the Asian countries in the sample.⁹

Accounting is also the basis for some recent efforts to develop standardized measures of trade-related economic upgrading. International competitiveness, it should be noted, is typically measured by relative unit labor costs, where competitiveness is presumed greater when unit costs are lower:

⁹ The growth theory framework of Kaldor (1954) has also supported the study of upgrading at the sectoral level. Kaldor posited that manufacturing productivity growth serves as the driver for economic growth generally across the economy because of scale economies and learning in manufacturing that raise productivity throughout the economy. See Mamgain (1999) for an econometric test for some developing countries

$$R = W(1/\Pi)E \quad (5)$$

where R designates unit labor costs in foreign currency terms, W is wages, Π is labor productivity and E the nominal exchange rate.

Taking the total differential of equation (4) gives the growth rate of R :

$$\hat{R} = \hat{W} - \hat{\Pi} + \hat{E} \quad (6)$$

where \hat{R} denotes the growth rate of relative unit labor costs, \hat{W} the growth rate of wages, $\hat{\Pi}$ the growth rate of labor productivity and \hat{E} the growth rate of the exchange rate.

From (6) we see that improvements in international competitiveness (a decline in \hat{R}) can result from a decline in wage growth, an increase in productivity growth, or from a currency devaluation. To associate an increase in trade performance with “upgrading” veils the contribution of these different aspects of competitiveness. Studies of Chinese and Mexican export expansions, for example, have shown that all of these factors played some role. In both of these cases, productivity growth outpaced wage growth, leading to declining \hat{R} .¹⁰

To avoid this ambiguity and to be more consistent with the notion of economic upgrading, we might look instead for cases of constant or improving market share along with rising export prices. Amighini (2006) decomposes the change in a sector’s exports into three components: (1) external market conditions; (2) change in market share; (3) change in product price. Kaplinsky and Readman (2004), in a study of the wood furniture industry, develop a similar framework, focusing on market share and export unit value as indicators of upgrading. Upgrading occurs when there is a relatively good price performance and a stability or growth in market share. Amighini (2006) defines upgrading similarly, that is, when there is there is a rise in product price with an increase or no decrease in market share.

3.2 Econometric studies of economic and social upgrading

The econometric work related to upgrading also makes an important contribution beyond the case study literature and the accounting-based research. The starting point here is the analysis of economic growth. There has been an explosion of research using multi-country, time series data on the correlates of economic growth. This research began in earnest in the 1990s with the effort by growth theorists to implement a “new” growth theory that went beyond the Solow tradition of focusing on factor accumulation and a catch-all, exogenous, residual called “technological change” and to focus on (a) the endogeneity of technological change and (b) on institutions.¹¹

Is trade itself an adequate proxy for upgrading? From the perspective of the theory of economic growth, trade openness has been found to be important in a number of well-regarded studies.¹² Rodrik et al. (2002) argue that institutions are more important than the other two factors and that “once institutions are controlled for, integration has no direct effects on income, while geography has at best weak direct effects. Trade often enters the income regression with the “wrong” (i.e. negative) sign, as do many of the geographical indicators (Rodrik et al. 2002, p. 4). These results are not about economic growth, but about income level itself.

Economists have increasingly considered institutions important for explaining economic growth, but the institutions of industrial upgrading have not yet figured prominently in the analysis of economic

¹⁰ On China, see Ceglowski and Golub (2005). On Mexico, see Palma (2005).

¹¹ See Mankiw, Weil and Romer (1992) for an early review of theoretical developments.

¹² See Frankel and Romer (1999), for example.

growth. Research on growth and upgrading has rarely been connected and each line of research poses challenges for the other. The regression analysis lacks a rich account of income expansion and innovation at the micro or sectoral level. The upgrading literature pays too little attention to intersectoral upgrading, whether this is the result of aggregate demand effects or knowledge spillovers or the effect of increased competition (Taylor et al 2009).

Even within the research on trade and growth, there are competing theories of the link. Frankel and Romer (1999) show that geography and size can determine the magnitude of trade and in turn of growth. Thirlwall and Mcombie (1995) emphasize the demand effects of international trade. Building on the insights of Kaldor, find that the balance of payments can be a constraint on growth and thus that growth is a function of export expansion and import propensity. Analysis that begins with the global production network can begin to trace the relative important of these two forces. Research on revealed comparative advantage may be a useful starting point for more detailed empirical analysis. Hausmann et al. (2006) develop a measure of the income content of exports using the concept of revealed comparative advantage. The authors find this measure to be statistically significantly related to economic growth, indicating that countries exporting a higher value added bundle of goods and services are likely to have a higher rate of economic growth.¹³

The connection between economic and social upgrading more broadly has also been addressed with econometrics. Flanagan (2005) looks at pay and productivity growth in a 45-country sample for the apparel and the footwear sectors for the period 1995-1999 and shows an extremely high correlation. This gives support to the marginal productivity theory of income distribution and the notion that economic upgrading drives social upgrading even at the level of individual sectors. This is an important study that needs to be redone for a larger sample of countries and especially for a longer period of time.

Kucera (2001) and Kucera and Sarna (2004) reverse the traditional analysis and consider labor standards as independent variables in trade and investment models. They focus their econometric work on explaining exports and inward foreign direct investment at the country level. Their benchmark is the gravity model of trade, and they extends this to include a number of carefully constructed indexes on labor standards, labor rights and political freedom. The results are generally at odds with the conventional wisdom, specifically that countries with higher wages and better labor and political standards are not adversely affected in terms of export performance, and in some cases perform better in terms of attracting foreign direct investment.

3.3 Variable choice and comparability

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. Table 3 shows a list of measures of economic and social upgrading that have been used in past studies done at different levels of analysis: the nation, the sector or global production network and the firm or the plant. It shows a dizzying variety of measures across levels of analysis, but even across analyses done at the same level. Most of the variables listed in Table 3 are self-explanatory.

It is worth pointing out that output (the basis for calculating productivity growth) and value added are often used interchangeably. This is because GDP as a measure of goods and services production, like the concept of value added, does not double count intermediates. In the GDP accounts these are net out by counting final sales only. This is equal to value added as the sum of wages, profits, interest and government income. One reason for this has to do with the reliance on

¹³ Previously, Lee (1995) had used the concept of revealed comparative advantage to study upgrading by South Korea during the 1980s.

the broad category of value added. The focus on value added and its expansion in the definition and analysis of upgrading leaves aside the question of the distribution of value added among profits, wages and taxes. This distribution is essential to the analysis of the extent to which economic upgrading is associated with social upgrading. According to Gereffi et al. (2001, p. 5) “profitability has limitations for global value chain analysis because capital (whose reward is profit) is only one factor of production. Profits do not tell us anything about the returns to labor or the general productivity of the economy at large”.

There are qualitative aspects of social upgrading – the incidence of informality in labor markets, aspects of worker rights and labor standards – that obviously cannot be extracted even from the most detailed information on value added. A number of indices have been developed to overcome this problem, and these must be carefully integrated into the analysis of economic and social upgrading. Beyond the question of variable choice is the issue of magnitude. How much change in a given variable is enough to constitute upgrading or its opposite, downgrading? We begin to address this issue in the next section when we use cross-national evidence to measure “absolute” and “relative” upgrading.

Table 3: Measures of economic and social upgrading

Level of Aggregation	Economic Upgrading	Social Upgrading
<i>Nation</i>	<ul style="list-style-type: none"> -Productivity growth -Value added growth -Profits growth -Increased capital intensity -Export growth -Income in exports 	<ul style="list-style-type: none"> -Wage growth -Employment/Population growth -Growth in labor share -Formal employment -Decline in youth unemployment -Share of wage employment in non-agricultural employment -Gender equality of employment and wages (e.g. female intensity of paid employment) -Poverty reduction -Improved labor standards, including FACB, job safety, child labor, forced labor, employment discrimination -Regulation of monitoring -Improved political rights (freedom house index) -Human Development Index -No. of ILO conventions adopted -Decent work deficit
<i>Sector or GPN</i>	<ul style="list-style-type: none"> -Productivity growth -Value added growth -Profits growth -Export growth -Increased capital intensity -Increased skill intensity of functions (assembly/OEM/ODM/OBM/full package) -Increased skill intensity of employment -Increased skill intensity of exports 	<ul style="list-style-type: none"> -Wage growth -Employment growth -Improved labor standards, including FACB, job safety, child labor, forced labor, employment discrimination
<i>Firm or plant</i>	<ul style="list-style-type: none"> -Increased skill intensity of functions (assembly/OEM/ODM/OBM/full package) -Developing skill to manage the supply chain -Composition of jobs -Increased capital intensity/mechanization -Product, process, functional, chain upgrading 	<ul style="list-style-type: none"> -Improved standards in plant monitoring (e.g. M-audit criteria) -Number of workers per job

Source: Own illustration.

One basis for operationalizing the concept of social upgrading (which also allows for downgrading) is the notion of “decent work” that has been developed over the past ten years by the ILO and operationalized in a series of papers published in the International Labour Review in 2003. Decent work comprises four aspects of work: employment, social protection, workers’ rights, and social dialogue (Ghai, 2003). Each of these categories may be measured with a variety of variables. Anker et al. (2003) propose eleven groups of indicators, with a series of measurable variables comprising each group. The eleven groups are: employment opportunities, unacceptable work, adequate earnings and productive work, decent hours, stability and security of work, combining work and family life, fair treatment in employment, safe work environment, social protection, social

dialogue and workplace relations, economic and social context of decent work (Anker et al., 2003, p. 7).

4. Cross-national evidence on economic and social upgrading

4.1 Trade and economic upgrading

We have constructed a sample of 30 developing countries in order to begin to analyze the relation among trade and upgrading. Our analysis is simply suggestive – since a rigorous test would require considerable more attention to sectoral and firm-level patterns – that even at very aggregate levels some of the basic presumptions about the connections between trade and economic upgrading and social upgrading may not hold. *Figure 2* is a scatterplot of export growth and the growth in value added per worker over the period 1980-2006, and includes the OLS bivariate regression line. Export growth is on average associated with higher value added per worker. A similar pattern is found when the trade variable is the compound annual growth in the high technology share of total exports.

While the correlation is clear in the scatterplot, the magnitudes are obscure. We calculate an “upgrading ratio”, z , as the ratio of the growth in value added to the growth in exports and define three measures of upgrading as follows:

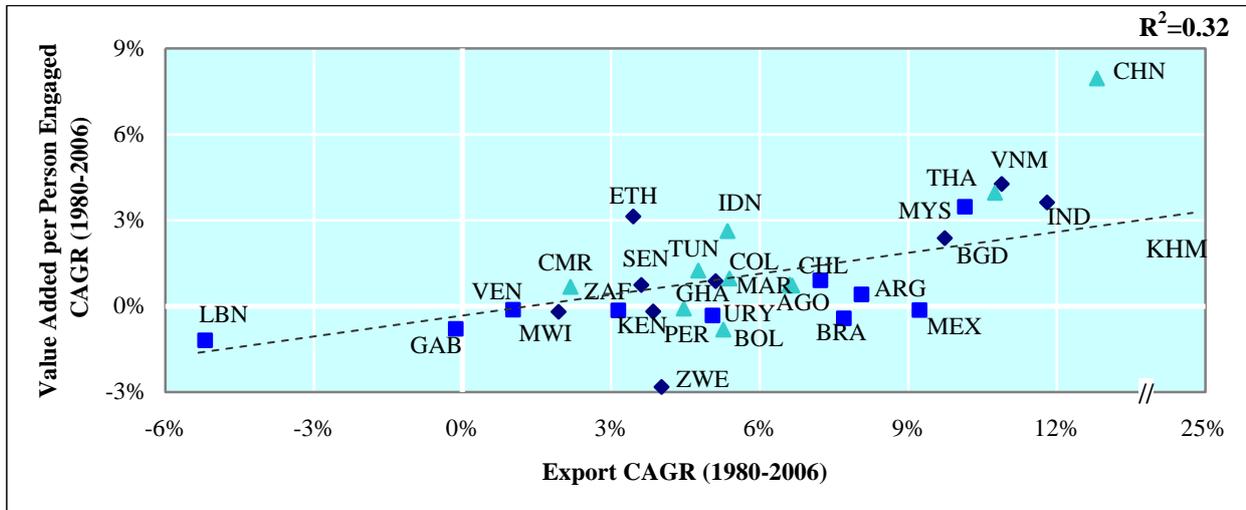
If $z > 1$, then “strong absolute upgrading”;

If $z > 1/4$ then “weak absolute upgrading”;

If $z > 1/\beta$ (where β is the slope coefficient in the regression), then “relative upgrading”.

Table 4 shows the countries in the sample that satisfy each of the criteria for upgrading.

Figure 2: Growth in export and value added per person engaged
(Compound Annual Growth Rates for 1980-2006)



Source: Own illustration. Data: UNCTAD, Handbook of Statistics; United Nations Statistics Division, National Accounts Main Aggregates Database.

NB: Exports at 1990 prices in M. U.S.\$; Value Added at 1990 prices in M. U.S.\$

Table 4: Classification of upgrading in 30-country sample

Strong Absolute Upgrading $z > 1$	Weak Absolute Upgrading $z > 1/4$	Relative Upgrading $z > 1/\beta$
	Vietnam India Ethiopia China Indonesia Thailand Tunisia Cameroon Malaysia	Bangladesh Vietnam India Ethiopia Senegal China Indonesia Thailand Tunisia Cameroon Malaysia Lebanon

Source: Own illustration. Data: Based on Figure 2.

We note first of all that no countries in the sample satisfy the criterion of absolute upgrading and only nine satisfy the criterion for “weak absolute upgrading” and “relative upgrading”. Perhaps as expected, many of the upgrading countries are Asian (Bangladesh, Vietnam, India, China, Indonesia, Thailand, and Malaysia) and none are from Latin America. This is consistent with the case study literature, especially as it relates to apparel and electronics. The presence of three sub-Saharan African countries (Ethiopia, Senegal and Cameroon) is surprising and requires further analysis. Countries that did not satisfy the criteria for upgrading might be said to have experienced downgrading. One can quickly see in Figure 3 that Mexico, Peru, Bolivia and Peru all fall into the

group of economic downgraders, since they are not only below the OLS regression line, but experienced positive export growth and negative growth in per capita value added.

The finding that so few countries experience broad-based economic upgrading are supported by recent studies showing that the export-led growth strategy adopted by most developing countries following the debt crisis in the 1980s (in place of the previous strategy of import substitution industrialization) has suffered from a “fallacy of composition” problem. That is, it may be advantageous for one country if it alone achieves exporter status in a particular industry. But if many countries make the same calculation, all countries will be unable to capture the same advantage because of lower prices that follow from the expansion of world supply.¹⁴

The result can be a disproportionately small rise in value added, implying minimal economic upgrading. Falling prices would be evidence of downgrading. In an analysis of U.S. import prices, Milberg (2008) found that only two sectors – and those most closely associated with commodities (specifically petroleum and iron) rather than manufacturers – experienced import price increases. Relative import price declines were smallest in manufacturing sectors most intensive in foods, metals and wood. Import price declines were greatest in those sectors which have both the technological and the value chain characteristics identified with profitable offshore outsourcing – computers and electrical and telecommunications products. But many of the non-electronics manufacturing sectors showed large and persistent import price declines, especially those with well-developed GVCs and high rates of import penetration in the U.S. clothing, footwear, textiles, furniture, miscellaneous manufacturers (which includes toys) and chemicals all experienced import price declines (relative to U.S. consumer prices) over two decades of more than 1% per year on average, or 40% over the period 1986-2006.

The situation would appear to be a contemporary version of the Prebisch-Singer dilemma. Developing country firms have made the transition to manufacturing exports, yet are again suffering the terms of trade stagnation predicted by Prebisch-Singer in earlier years on the basis of developing countries’ specialization in agricultural and natural resource-based production.¹⁵ Irrespective of methodological approach, studies that focus on the terms of trade are often more pessimistic about prospects for economic upgrading than those that focus on functional upgrading, for example. With the rise of GPNs, Prebisch-Singer structural problems are now not about the nature of the product but about the trading relations.

Heinz (2006) and Milberg (2004) emphasize branding and other barrier entries in GPNs as creating an asymmetry of market structures along GVCs. Thus while many lead firms in GPNs have oligopoly power in product markets, they operate in factor or input markets that are highly competitive. Buying practices of lead firms can lead to shaving of markups and cost cutting by suppliers that leaves them unable to innovate and resistant to social upgrading. Milberg (2004) documents how lead firms induce these competitive conditions in supplier markets. This dynamic may account for the continued importance of arm’s-length transactions within GPNs since in such conditions supplier firms will not earn economic rents. That said, there is a growing awareness of the power of large, first-tier suppliers, who have market power of their own (see, for example, Sturgeon, 2001).

4.2 Trade and social upgrading

At the simplest level, higher exports, all other things equal, will lead to higher employment. This is borne out by the positive correlation between export growth and employment growth in our sample

¹⁴ See Mayer (2001) and Razmi and Blecker (2008) for empirical evidence of a fallacy of composition.

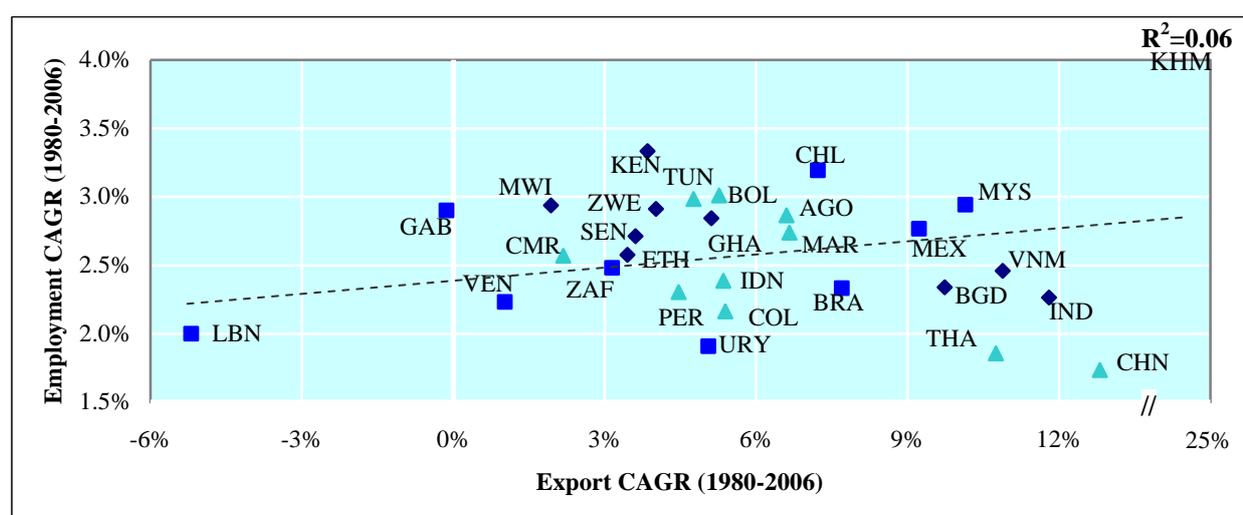
¹⁵ For a review of the evidence on the terms of trade, see Kaplinsky (2005).

(Figure 3). This relation is in part an explanation for the continued reliance on export processing zones (EPZs) even up to the present day. The number of countries using EPZs increased to 130 in 2006, up from 116 in 2002 and 25 in 1975.¹⁶ These 130 countries operated 3,500 EPZs, employing 66 million people. China has been by far the major country of expansion of EPZ activity, now estimated to have 40 million people working in EPZs or EPZ-like operations, an increase of 10 million since 2002.

Outside of China, employment in EPZs doubled between 2002 and 2006, from 13 to 26 million. By 2006, all of the regions of the world with the exception of South America had a fairly large presence of EPZs in terms of employment. The active use of EPZs in East Asia, Central America and the Caribbean has been widely known and studied since they were created in the 1970s and 1980s. Today there are over 90 EPZs in sub-Saharan Africa and in the transition economies of Eastern and Central Europe, including those accounting for a significant share of country exports in Gabon, Ghana, Kenya, Lesotho, Mali, Mozambique, Nigeria, Zimbabwe, the Czech Republic and Lithuania. China now has 40 million jobs in EPZs and the increase in Chinese employment in EPZs from 2002 accounts for almost half of the global expansion of EPZ employment in the period (Milberg, 2007).

Figure 3: Export and employment growth

(Compound annual growth rates for 1980-2006)



Source: Own illustration. Data: United Nations Statistics Division, National Accounts Main Aggregates Database; Groningen Growth and Development Centre, Total Economy Database; UNCTAD, Handbook of Statistics.

NB: Exports at 1990 prices in M. U.S.\$.

EPZs continue to contribute a major share of national exports in many countries, over 80% in many countries. Costa Rica's EPZs accounted for 10 percent of manufactured exports in 1990 and reached 50-52% in the early 2000s.¹⁷ Bangladesh saw its EPZ exports rise from 3.4% in 1990 to 21.3% in 2003.¹⁸ A number of countries had a decline in the EPZ share of exports, including Mexico, Philippines, Tunisia and Mauritius. In some cases this was the result of heightened competition in global apparel trade resulting from the phaseout of textile and apparel quotas. In

¹⁶ See Milberg (2007).

¹⁷ Engman et al. (2007) p. 26.

¹⁸ Aggarwal (2005, Table 7.6).

Mexico another contributing factor was the expansion of non-EPZ based exports, in particular in electronics. We should note that more rapid growth in high-technology exports is not associated in our sample with especially rapid employment growth.

What about the reverse relation? That is, does social upgrading adversely affect international trade performance? Social upgrading (in the sense of higher pay or labor standards) is typically thought to raise production costs.¹⁹ If adopted in one country, such upgrading should lead to reduced international competitiveness. Recent research shows that this conventional wisdom is not supported by the evidence across a broad sample of developing countries. Kucera (2001) models labor costs and foreign direct investment flows as a function of a series of indicators of core labor standards for a sample of 127 countries. His results fail to confirm the “conventional wisdom” that adherence to higher labor standards raises labor costs and reduces inward foreign direct investment. One possible implication of Kucera’s findings is that the causality may be reversed between economic and social upgrading. That is, if social upgrading does not adversely impact trade performance then it may be the result of improved productivity and product quality that results from improved pay and work conditions.

An important dimension of social upgrading is gender equality and there is considerable research on the extent to which the expansion of international trade promotes gender equality. In his well-known papers, Standing (1989, 1999) argues that globalization (trade expansion) led to a rise in female labor force participation relative to men because women were being employed in increasingly large numbers by firms competing on the world market in labor-intensive, low value added goods as a means to reduce costs. EPZ employment in a number of countries, for example, is very heavily female. Recent evidence suggests that there has been a process of “defeminization” of labor in manufacturing in a number of countries in East Asia and a continuing feminization in Latin America. Tejani and Milberg (2010) find that this variation in patterns is most closely associated with industrial upgrading. As East Asian firms have shifted into higher-technology sectors and higher-tech dimensions of existing sectors, female intensity has fallen. They attribute this to a combination of a skills mismatch and to continued segregation of higher-skill occupations.

Amidst all the analysis of GVCs, we should not lose sight of important macroeconomic determinants of social upgrading. Economic upgrading is more likely to translate into social upgrading in any given sector when there are conditions of rapid aggregate demand growth, in particular global demand. This would indicate a high correlation of upgrading across sectors within countries. That is, there are very likely important country effects with respect to all aspects of upgrading, and these may swamp the considerations specific to a particular global production network.²⁰

4.3 Economic upgrading and social upgrading

The link between economic upgrading and social upgrading is rooted in economic theory that sees wage growth closely tied to productivity growth. If we accept productivity growth (e.g. changes in output per worker) as a proxy for economic upgrading and wage growth as a reasonable representation of social upgrading, then we can look to economic theory for an explanation of the relation between economic and social upgrading. As is often the case in economics, there are

¹⁹ See, for example, Culem, 1988, Friedman et al. 1992. For an overview of the “conventional wisdom”, see Kucera (2001), pp. 2-6. The conventional wisdom seems to hold with respect to gender, as gender wage gaps have been identified as the basis for enhanced international competitiveness and growth (see Seguino, 2000, for East Asia, Berik et al., 2004, for South Korea and Taiwan, Busse and Spielman, 2006, for a sample of 92 countries).

²⁰ Wood (2001) emphasizes this point.

competing theories – neoclassical and institutionalist – and no clear consensus view on which theory is better. Let's review them briefly here.

The neoclassical theory, found in most economics textbooks, is based on the tradition of marginalist analysis. In this theory, wages are determined in the labor market by the supply of and demand for labor. Given a particular labor supply, the focus of the theory is on labor demand, which comes from profit-maximizing firms based on their calculation of the marginal revenue generated by labor, as follows:

$$W = MRP_L = MP_L \cdot P_x \quad (7)$$

where W is the wage, MRP_L the marginal revenue product of labor, MP_L be the marginal product of labor and P_x be the market price of the good X produced. According to this relation, wages are a function both of the marginal productivity of labor and of the product market price of labor's output. This implies that wages rise as the marginal productivity of labor rises, assuming the price of the good produced remains constant. For our purposes here, the theory implies that, other things equal (labor supply and product market conditions), a rise in productivity should result in a rise in wages. That is, social upgrading will be the result of industrial upgrading.

There is considerable debate, especially in recent years, over the link between productivity growth and wages. Flanagan (2005) in a study of a sample of about 100 developing countries finds a very tight statistical fit between the growth in productivity and wages in manufacturing. These findings support the notion that social upgrading follows from economic upgrading and that to accomplish the former, the focus of policy should be on the latter. There are important deviations from this finding, however. In the U.S. over the past twenty years, median wages have been relatively stagnant as productivity growth has continued at 1-3 percent per year (Mishel and Bernstein, 2008). Mexico has experienced an even more dramatic gap between productivity growth and wages (Palma, 2005). The implication of the growing gap is a rise in the share of national income going to profits. Harrison (2002) finds that trade openness has been associated with a rising profit share across a large sample of developing countries. This does not directly contradict Flanagan's findings, but it does raise questions about the extent to which social upgrading is accomplished through trade liberalization.

The main alternative to the neoclassical theory of labor markets is an institutionalist approach, in which wages are understood to be a function of bargaining power of labor versus management and in which labor market regulations and their enforcement play an important role in determining outcomes. Union density, bargaining rights, minimum wages, active labor market policies have been found to be significant determinants of labor market outcomes in developed and developing economies.²¹ Thus from the institutionalist perspective, the tight connection between productivity growth and wages is not guaranteed but will depend on the context.

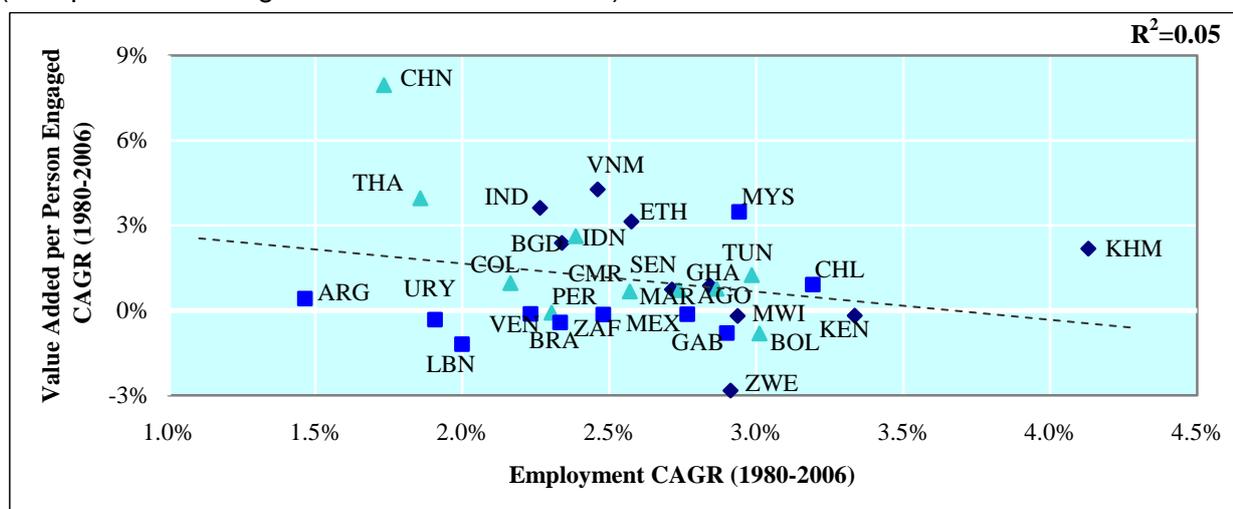
A first glance at our sample of 30 developing countries shows the connection between economic and social upgrading is weaker than the connection between export growth and economic upgrading. *Figure 4* shows the relation between the growth in value added per worker and the growth in employment. The correlation is very low, and an OLS regression line slopes negatively – indicating that higher per capita value added growth is associated with lower employment growth.²² Employment, too, can be a deceptive measure of social upgrading, since it doesn't account for the quality of work, the standards of employment or the degree of informal or unpaid labor.

²¹ On developed countries, see Howell (2005). On developing countries, see Berg and Kucera (2007).

²² A similarly ambiguous result is found in the correlation between growth in the intensity of high-technology exports and employment (*Figure 9*).

Figure 4: Growth in value added per person engaged and employment

(Compound annual growth rates for 1980-2006)



Source: Own illustration. Data: United Nations Statistics Division, National Accounts Main Aggregates Database; UNCTAD, Handbook of Statistics; Groningen Growth and Development Centre, Total Economy Database.

NB: Value Added at 1990 prices in M. U.S.\$.

4.4 Labor monitoring and the endogeneity debate

In addition to the extensive evidence on upgrading at the national and sectoral levels is an accumulating body of research on the monitoring of labor standards by civil servants (Piore and Schrank, 2006, 2008, Seidman, 2007) by NGOs (Barrientos, 2008) and by firms themselves (Locke, 2006, Locke et al. 2006). These studies are rigorous and based on both interviews with auditors and on independent observation. The research gives varied results. Piore and Schrank find that labor monitors in the Dominican Republic have used a variety of techniques to make a marked difference on labor standards there. Locke et al. (2006, 2007) concludes that Nike's "management audit" had a minimal and inconsistent impact on labor standards over repeated audits. Locke (2008) finds that it is the commitment over time of the supplier to the buyer firm rather than a coercion *per se* that supports upgrading.

The premise of the research on plant-level monitoring of labor standards is that social upgrading can be attained through regulation and monitoring and thus does not require economic upgrading or even economic growth as a prerequisite. This view is at odds with most of economic theory – both neoclassical and Keynesian – in which social upgrading is viewed as endogenous to the process of economic and productivity growth. In the neoclassical view, higher marginal productivity results in higher wages. In the Keynesian view, higher levels of aggregate demand lead to greater labor demand and (other things equal) higher wages.

These two perspectives on social upgrading not only indicate very different research programs, they also give very different policy conclusions. It is likely that there is some truth in both views. Kucera and Sarna (2004, p. 9), for example, propose that some labor standards (e.g child labor)

are a function of per capita income and others (e.g. freedom of association and collective bargaining rights) are not.²³

5. Conclusion: research directions and policy implications

Our overview of this eclectic body of research leads us to identify a number of ways in which current research could be extended to improve our understanding of the relation between economic growth or upgrading and social upgrading in GPNs:

(1) There is a need to integrate the empirical research on economic growth with that on industrial upgrading. Do these processes always work in tandem, or are there instances where sectoral upgrading is not associated with national economic expansion? The issue raises both methodological and theoretical tensions. The methodological tension has to do with the integration of sectoral (or firm)-based research with macroeconomic analysis. The theoretical tension is between neoclassical and institutionalist approaches, where in the former the link between economic and social upgrading is automatic while in the latter there are a variety of norms and regulations that mediate this relation.

(2) There is need for careful thinking about the link between economic and social upgrading. This requires again facing the theoretical tensions mentioned above. There is support for two distinct positions with quite different implications for policy. One is that economic and social upgrading are endogenous to the process of economic growth. This view is held by both neoclassical and Keynesian economists.²⁴ Others have raised the possibility that not all growth raises social standards. The GPN approach offers at least two explanations. One is that economic upgrading within one sector does not spill over broadly to the rest of the economy. The other is that GPNs are governed by and serve the interests of lead firms. As a result, productivity gains in one network may siphon forward in the transfer of profits to lead firms.

(3) The link between international trade expansion and social upgrading also should be carefully analyzed. Conventional wisdom is that higher pay and labor standards raise costs and reduce international competitiveness. A growing body of research, reviewed above, finds that higher social standards do not adversely impact export performance. While this runs counter to standard trade theory, we should note that the general perspective of upgrading is anathema to traditional theories of trade based on comparative advantage. The notion of economic upgrading is largely about gaining competitiveness in higher value added processes, a strategy that may conflict with the dictates of the principle of comparative advantage in which an “optimal” pattern of trade may call for countries remaining specialized in low value added goods.

(4) There is a need for a theory of “downgrading”. Our cross-country results are consistent with many findings that most countries and sectors are not experiencing upgrading by acceptable definitions. Since these instances predominate, it would be useful to theorize this rather than simply label them as instances where upgrading does not occur.

Addressing these four issues and facing the methodological and theoretical tensions they raise has potentially important policy implications. In particular, better understanding of the slippage that may occur in the movement from economic growth to employment creation or other aspects of social upgrading could influence the desired policy mix. If social upgrading is not endogenous to the process of economic growth or even to the process of industrial upgrading, then pro-growth

²³ See also Polaski (2008).

²⁴ Across the spectrum, see Flanagan (2005), Piore (2004) and Reinert (2007).

policies alone will be inadequate to accomplish social upgrading and such policies as improving labor standards and regulations and the capacity to enforce them should become a priority. If there are aspects of social upgrading that are income-driven and others that are not, as some have suggested, then it is likely that the promotion of social upgrading will be helped by the simultaneous pursuit of more rapid economic growth and the implementation of regulations and the creation of institutions that directly address aspects of social upgrading that growth alone does not affect.

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