

Economic and social upgrading in global production networks: Problems of theory and measurement

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***Abstract.** Economic development has increasingly become synonymous with “economic upgrading” within global production networks (GPNs). Yet, while there has been much research on connecting economic upgrading with economic growth and international trade, there has been less analysis of the relationship between economic and “social upgrading”, i.e. improvements in the wages, conditions, rights, gender equality and economic security of workers in GPNs. Focusing on developing countries, this article reviews the ways in which economic and social upgrading are measured and scrutinizes the theoretical connection between these two dimensions of upgrading. The authors conclude with a brief discussion of policy implications.*

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 niches of production and export. There has been much research on economic upgrading in GPNs, connecting economic growth and economic upgrading to international trade performance. But there has been less analysis of what such upgrading means for living standards, including wages, working conditions, economic rights, gender equality and economic security. In this article we refer to improvements in these aspects of economic and social life as “social upgrading”.

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With a primary focus on developing countries, the article reviews the ways in which economic and social upgrading in GPNs are measured. In the process, we also scrutinize the theoretical connection between these two dimensions of upgrading within GPNs.

The growth of developing countries' exports of manufactures since 1980 has been impressive – explosive in some cases, such as Brazil, China, India and Mexico (see table 1). While including 2009 as the final year underestimates the dramatic growth rates seen especially in the 2000s, this better reflects the post-crisis trade environment, which is characterized by more South–South linkages. 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) calculated that 50 per cent of the growth in United States 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 per cent of the growth of China's trade in the period 1992–2003, with very rapid growth in vertical specialization in the 2000s, exceeding 50 per cent of trade in some sectors (ILO, 2008, p. 8).

The globalization of production is also reflected 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 per cent of input use in the United Kingdom, 23 per cent in Germany and over 17 per cent in the United States. In the cases of Germany and the United States, these levels reflect slow but steady growth in reliance on imported inputs of materials, growing about 50 per cent over the ten-year period considered. For services, the range is much lower (between 0.8 and 3 per cent), but the rates of growth are, for all three countries, higher than for materials offshoring. As a number of recent studies indicate, services offshoring is likely to continue to expand more rapidly than materials offshoring in the years to come (see Blinder, 2007, for estimates of the number of services jobs that have become vulnerable to offshoring). Although offshoring has a long history,¹ it was in the 1990s that managing the global supply chain became an important “strategic asset” in itself for United States companies in their competition with low-cost and flexible Japan and increasingly innovative Europe (Lynn, 2005, p. 123). In the past ten years, Japanese producers and European firms have developed highly sophisticated GPNs, both for producers and for retailers.

The GPN – defined by Sturgeon (2001) as “a set of inter-firm relationships that bind a group of firms into a larger economic unit” – has proven to be a powerful device for the study of economic upgrading because it has been found to set the context in which firms have raised their productive capabilities, especially through learning from relations with buyers, as these supplier firms seek to

¹ For example, according to Hamilton, Petrovic and Feenstra (2006), the creation of Asian suppliers for large United States retail firms began in the late 1960s.

Table 1. Developing countries' exports of goods, 1980–2009

	Exports (at 2005 US\$, millions)				Average annualized growth rate (percentages)			
	1980	1990	2000	2009	1980–90	1990–2000	2000–09	1980–2009
Brazil	22,683	46,447	81,118	132,696	7.4	5.7	5.6	6.3
China	49,679	86,230	362,317	1,109,505	5.7	15.4	13.2	11.3
India	13,660	22,736	72,882	230,407	5.2	12.4	13.6	10.2
Mexico	25,875	54,874	192,471	230,913	7.8	13.4	2.0	7.8
Developing countries	925,502	1,275,164	2,883,107	5,142,775	3.3	8.5	6.6	6.1

Source: Authors' calculations based on data from *UNCTAD Handbook of Statistics*.

produce internationally competitive goods and services. Regarding the great increase in some developing country firms' industrial performance in the 1990s, a United Nations Industrial Development Organization (UNIDO) report noted that "the main cause of the large upward leaps appears to be participation in integrated global production networks, 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 upgrading studies 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, pp. 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, which is the focus of most value chain research) may be hard to quantify, but nonetheless seems to be one of those things that fits the phrase "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 (see Humphrey, 2004, for an overview). Quantification might be helpful to find out, say, 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 difficult questions to answer without agreed quantitative measures of upgrading. Measurement will also help

to formulate and assess policies intended to improve social upgrading relative to economic upgrading.

The concept of social upgrading captures gains in living standards and conditions of employment over time. The most basic expressions of this are employment and pay. Then there are issues of working 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, labour 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 is determined by relative strength on the two sides, with labour market institutions (e.g. minimum wages, union bargaining protections) as significant determinants of the outcome. In such a context, social upgrading is delinked from technological change per se and also associated 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, labour and capital) or raise productivity. Leaving capital costs aside, we can simplify the issue as being between lowering wages and raising labour 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 road 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 as such, but rather about trade, investment, productivity, industrialization, wages, labour 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 the Republic of Korea’s high-road strategy, Kaplinsky (1993) on the export processing zone-led low-road strategy in the Dominican Republic, and Moreno-Brid, Santamaría and Rivas Valdivia (2005) on the low-road path of Mexican export growth after the implementation of the North American Free Trade Agreement (NAFTA).

³ Stefano Micelli has noted that over the long run only two quadrants in figure 1 are sustainable. The upgrading/upgrading quadrant is the virtuous cycle where economic upgrading supports social upgrading. The downgrading/downgrading quadrant is the vicious cycle where economic downgrading can only support social downgrading. This implies that the question is not so much whether economic upgrading generates social upgrading, as how long the process takes.

Figure 1. Economic and social upgrading

		Social realm	
		Upgrading	Downgrading
Economic realm	Upgrading	High-road growth	Low-road growth
	Downgrading	High-road decline	Low-road decline

The presumption in the literature is that economic upgrading brings both improved export performance and social upgrading. Here, our analysis of a sample of developing countries shows 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 remainder of this article comprises three sections. The first surveys the dominant methods used to measure economic and social upgrading. The second presents some cross-national evidence from a sample of 30 developing countries. And the third briefly considers the implications for policy and for future research.

Measuring upgrading in global production networks

Most of the massive amount of research done on upgrading in GPNs has focused on the study of individual cases of countries or sectors. Case studies bring a deeper understanding of the process of upgrading, the role of each of the key actors 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; and 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, however, 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, sectoral case study research on GVCs, there are two other important methodological approaches to the study of upgrading and trade, namely, accounting and econometrics.

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. Labour productivity Π is measured as output Q per worker L .

$$\Pi = Q/L \quad (1)$$

Thus, growth in labour productivity $\hat{\Pi}$ also has two components: the growth in output \hat{Q} and the growth in employment \hat{L} :

$$\hat{\Pi} = \hat{Q} - \hat{L} \quad (2)$$

Rearranging (2) gives:

$$\hat{Q} = \hat{\Pi} + \hat{L} \quad (3)$$

Pieper (2000), building on Kaldor (1957), defines positive productivity growth greater than 3 per cent per annum as “economic sustainability” and employment growth greater than 3 per cent as “social sustainability”. She measures these for a large sample of developing countries and finds unsustainable outcomes in many of the African and Latin American countries in her sample, and sustainable outcomes in many of the Asian countries.

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 labour costs, where competitiveness is presumed greater when unit costs are lower:

$$R = W(1/\Pi)E \quad (4)$$

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

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

$$\hat{R} = \hat{W} - \hat{\Pi} + \hat{E} \quad (5)$$

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

From equation (5), we see that improvements in international competitiveness (i.e. 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 therefore veils the influence of these different factors 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} (on China, see Ceglowski and Golub, 2007; on Mexico, see Palma, 2006).

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 change in a sector’s exports into three components: (1) external market conditions; (2) change in market share; (3) change in product price. In their study of the wood furniture industry, Kaplinsky and Readman (2005) develop a similar framework, focusing on market share and export unit value as indicators of up-

grading. Upgrading occurs when there is a relatively good price performance and stability or growth in market share. Amighini (2006) defines upgrading similarly, that is, as a rise in product price with an increase or no decrease in market share.

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 analysis of economic growth. There has been an explosion of research using panel data on the correlates of economic growth. This research began in earnest in the 1990s with the efforts of 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”, to focus on (a) the endogeneity of technological change and (b) on institutions (for an early review of theoretical developments, see Mankiw, Romer and Weil, 1992).

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 (for example, see Frankel and Romer, 1999). Rodrik, Subramanian and Trebbi (2004) argue that institutions are more important than the other two factors and that “[o]nce institutions are controlled for, integration has no direct effect on incomes, 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” (ibid., p. 4). These results are not about economic growth, but about the 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 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.

Even within the research literature 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. McCombie and Thirlwall (1994) emphasize the demand effects of international trade. Building on the insights from Kaldor, these authors 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 GPN can begin to trace the relative importance of each of these two forces. Research on revealed comparative advantage may be a useful starting point for more detailed empirical analysis. Hausmann, Hwang and Rodrik (2005) develop a measure of the income

content of exports using the concept of revealed comparative advantage. These 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.⁴

The connection between economic and social upgrading has also been addressed more broadly with econometrics. Flanagan (2006) looks at pay and productivity growth in a 45-country sample for the apparel and the footwear sectors over the period 1995–99 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 labour 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 extend this to include a number of carefully constructed indexes on labour standards, labour rights and political freedom. The results are generally at odds with the conventional wisdom, specifically that countries with higher wages and better labour 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.

Variable choice and comparability

The problem of comparability of the case studies is compounded by the fact that they use such a wide range of variables to measure economic and social upgrading. Table 2 shows a list of measures of economic and social upgrading that have been used in past studies at different levels of analysis: the country, the sector or GPN, and the firm or the plant. It shows a dizzying variety of measures across levels of analysis, but even across analyses at the same level. Most of the variables listed in table 2 are self-explanatory.

It is worth pointing out that output (the basis for calculating productivity growth) and value added are often used interchangeably when measured at the national level. 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 netted 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 reliance on 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 between profits, wages and taxes. This distribution, however, is essential to analysis of the extent

⁴ Previously, Lee (1995) had used the concept of revealed comparative advantage to study upgrading by the Republic of Korea during the 1980s.

Table 2. Measures of economic and social upgrading

Level of aggregation	Economic upgrading	Social upgrading
Country	Productivity growth Value added growth Profits growth Increased capital intensity Export growth Growth in export market share Unit value growth of output Unit value growth of exports	Wage growth Employment/population growth Growth in labour share Formal employment Decline in youth unemployment Gender equality in employment and wages Poverty reduction Share of wage employment in non-agricultural employment Improved labour standards, including freedom of association and collective bargaining, job safety, child labour, forced labour, employment discrimination Regulation of monitoring Improved political rights (Freedom House Index) Human Development Index (HDI)
Sector or GPN	Productivity growth Value added growth Profits growth Export growth Growth of export market share Unit value growth of output Unit value growth of exports Increased capital intensity Increased skill intensity of functions (assembly/OEM/ODM/OBM/full package) Increased skill intensity of employment Increased skill intensity of exports	Wage growth Employment growth Improved labour standards, including freedom of association and collective bargaining, job safety, child labour, forced labour, employment discrimination
Firm	Increased skill intensity of functions (assembly/OEM/ODM/OBM/full package) Developing skills to manage the supply chain Composition of jobs Increased capital intensity/mechanization Product, process, functional, chain upgrading	Improved standards in plant monitoring, e.g. management and working conditions audit (M-audit) criteria Number of workers per job

to which economic upgrading is associated with social upgrading. According to Gereffi et al., “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 labour or the general productivity of the economy at large” (2001, p. 5).

There are also qualitative aspects of social upgrading – the incidence of informality in labour markets, aspects of worker rights and labour 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.

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 2003.⁵ Decent work comprises four aspects of work: employment, social protection, workers’ rights, and social dialogue (Ghai, 2003). Each of these categories may be measured using a variety of variables. Anker et al. propose 11 groups of indicators, with a series of measurable variables comprising each group. The 11 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; and economic and social context of decent work (2002, p. 7).

Cross-national evidence on economic and social upgrading

Trade and economic upgrading

We have constructed a sample of 30 developing countries in order to begin to analyse the relation among trade and upgrading (see table 3 for country sample). Our analysis is simply suggestive – since a rigorous test would require considerably 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 growth in value added per worker over the period 1980–2009, showing the ordinary least squares (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 per person engaged to the growth in exports and define three measures of upgrading, as follows:

if $z > 1$, it indicates “strong absolute upgrading”;

if $z > 1/3$, it indicates “weak absolute upgrading”;

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

⁵ See “Special issue: Measuring decent work”, in Vol. 142, No. 2.

Table 3. Country sample

Country	Country code	Income
Angola	AGO	Lower middle
Argentina	ARG	Upper middle
Bangladesh	BGD	Low
Bolivia	BOL	Lower middle
Brazil	BRA	Upper middle
Cambodia	KHM	Low
Cameroon	CMR	Lower middle
Chile	CHL	Upper middle
China	CHN	Lower middle
Colombia	COL	Upper middle
Ethiopia	ETH	Low
Gabon	GAB	Upper middle
Ghana	GHA	Low
India	IND	Lower middle
Indonesia	IDN	Lower middle
Kenya	KEN	Low
Lebanon	LBN	Upper middle
Malawi	MWI	Low
Malaysia	MYS	Upper middle
Mexico	MEX	Upper middle
Morocco	MAR	Lower middle
Peru	PER	Upper middle
Senegal	SEN	Low
South Africa	ZAF	Upper middle
Thailand	THA	Lower middle
Tunisia	TUN	Lower middle
Uruguay	URY	Upper middle
Venezuela	VEN	Upper middle
Viet Nam	VNM	Low
Zimbabwe	ZWE	Low

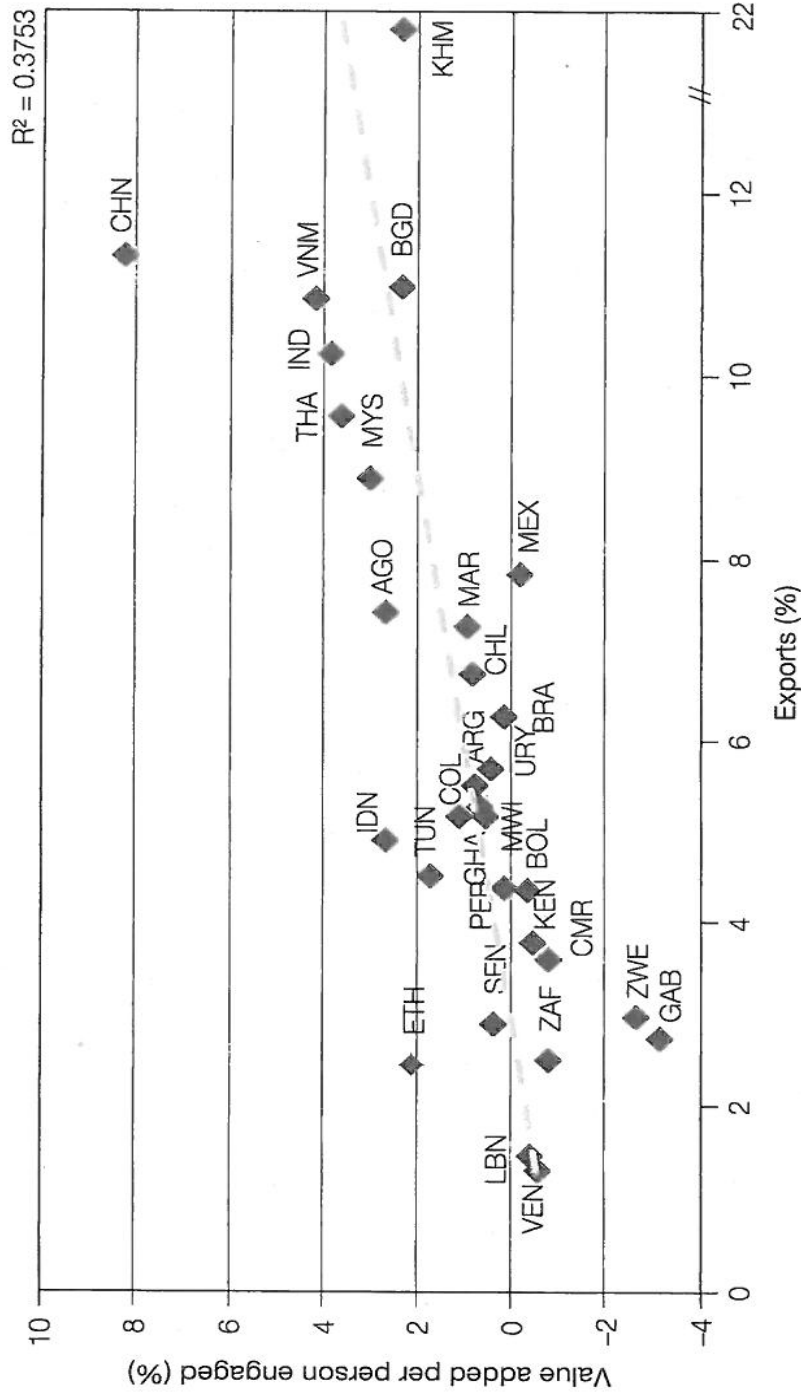
Notes: Income classification based on 2008 gross national income per capita; low income = US\$975 or less; lower middle income = US\$976–3,855 upper middle income = US\$3,856–11,905.

Source: World Bank, as of July 2009.

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

None of the countries in the sample satisfies the criterion for “strong absolute upgrading”, while only nine satisfy the criterion for “weak absolute upgrading”, and 11 that for “relative upgrading”. Unsurprisingly, many of the upgrading countries are Asian (China, India, Indonesia, Malaysia, Thailand and Viet Nam) and only one is in Latin America (Colombia). This is consistent with the case study literature, especially as it relates to apparel and electronics. The presence of three sub-Saharan African countries (Angola, Ethiopia and Senegal) is surprising and requires further analysis. Countries that did not satisfy any of the

Figure 2. Growth in exports and value added per person engaged (average annualized growth rates for 1980–2009)



Note: Exports and value added at 2005 prices.

Sources: Own illustration. Data: UNCTAD: Handbook of statistics; World Bank: World Development Indicators; Groningen Growth and Development Centre: Total Economy Database.

Table 4. Classification of upgrading in 30-country sample

Strong absolute upgrading $z > 1$	Weak absolute upgrading $z > 1/3$	Relative upgrading $z > 1/\beta$
	Angola	Angola
	China	China
	Ethiopia	Colombia
	India	Ethiopia
	Indonesia	India
	Malaysia	Indonesia
	Thailand	Malaysia
	Tunisia	Senegal
	Viet Nam	Thailand
		Tunisia
		Viet Nam

Source: Authors' calculations based on figure 2.

criteria for upgrading might be said to have experienced downgrading or stagnation. As shown in figure 2, Bolivia, Brazil, Chile, Mexico, Peru and Uruguay all fall into the group of economic downgraders. Interestingly, not only are Bolivia and Mexico below the OLS regression line, but they also experienced positive export growth and negative growth in value added per worker. This low productivity growth relative to export growth in the Latin American countries in the sample is consistent with studies reporting very slow industrialization and in some cases deindustrialization in that region (see Lall, Albaladejo and Mesquita Moreira, 2004).

The finding that so few countries experience broad-based economic upgrading is supported by recent studies showing that the export-led growth strategy adopted by most developing countries following the debt crisis of 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 alone to achieve 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.⁶

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 United States import prices, Milberg (2008) found that only two sectors – those most closely associated with commodities (specifically petroleum and iron) rather than manufactures – experienced import price increases. Relative import price declines were smallest in manufacturing industries, especially in foods, metals and wood. Import price declines were greatest in those industries which had both the technological and the value chain characteristics identified with profitable offshoring – computers and electrical and telecommunications

⁶ See Mayer (2003) and Razmi and Blecker (2008), for empirical evidence of a fallacy of composition.

products. But many of the non-electronics manufacturing industries showed large and persistent import price declines, especially those with well-developed GVCs and high rates of import penetration in the United States. Clothing, footwear, textiles, furniture, miscellaneous manufactures (including toys) and chemicals all experienced import price declines (relative to United States consumer prices) averaging more than 1 per cent per year over two decades, or 40 per cent 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 they are again suffering the terms-of-trade stagnation predicted earlier by Prebisch-Singer on the basis of developing countries' specialization in agricultural and natural-resource-based production.⁷ Irrespective of methodology, studies that focus on the terms of trade are often more pessimistic about prospects for economic upgrading than those that focus on, say, functional upgrading. With the rise of GPNs, Prebisch-Singer structural problems are now not about the nature of the product, but about trading relations.

Heintz (2006) and Milberg (2004) emphasize branding and other barriers to entry into 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. The buying practices of lead firms can result in shaving of mark-ups and cost cutting by suppliers that leave the latter 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 being 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).

Trade and social upgrading

The perceived positive relationship between exports and employment is no doubt one explanation for countries' continued reliance on export processing zones (EPZs) to this day. The number of countries using EPZs increased to 130 in 2006, up from 116 in 2002 and 25 in 1975 (see Milberg, 2007). These 130 countries operated 3,500 EPZs, employing 66 million people. China, by far the main locus of growth in EPZ activity, was estimated to have some 40 million people working in EPZs or EPZ-like operations in 2006, an increase of 10 million from 2002. This increase accounted for almost half of the global expansion of EPZ employment in the period (*ibid.*).

Outside 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 EPZ presence in terms of employment. The

⁷ For a review of the evidence on the terms of trade, see Kaplinsky (2005).

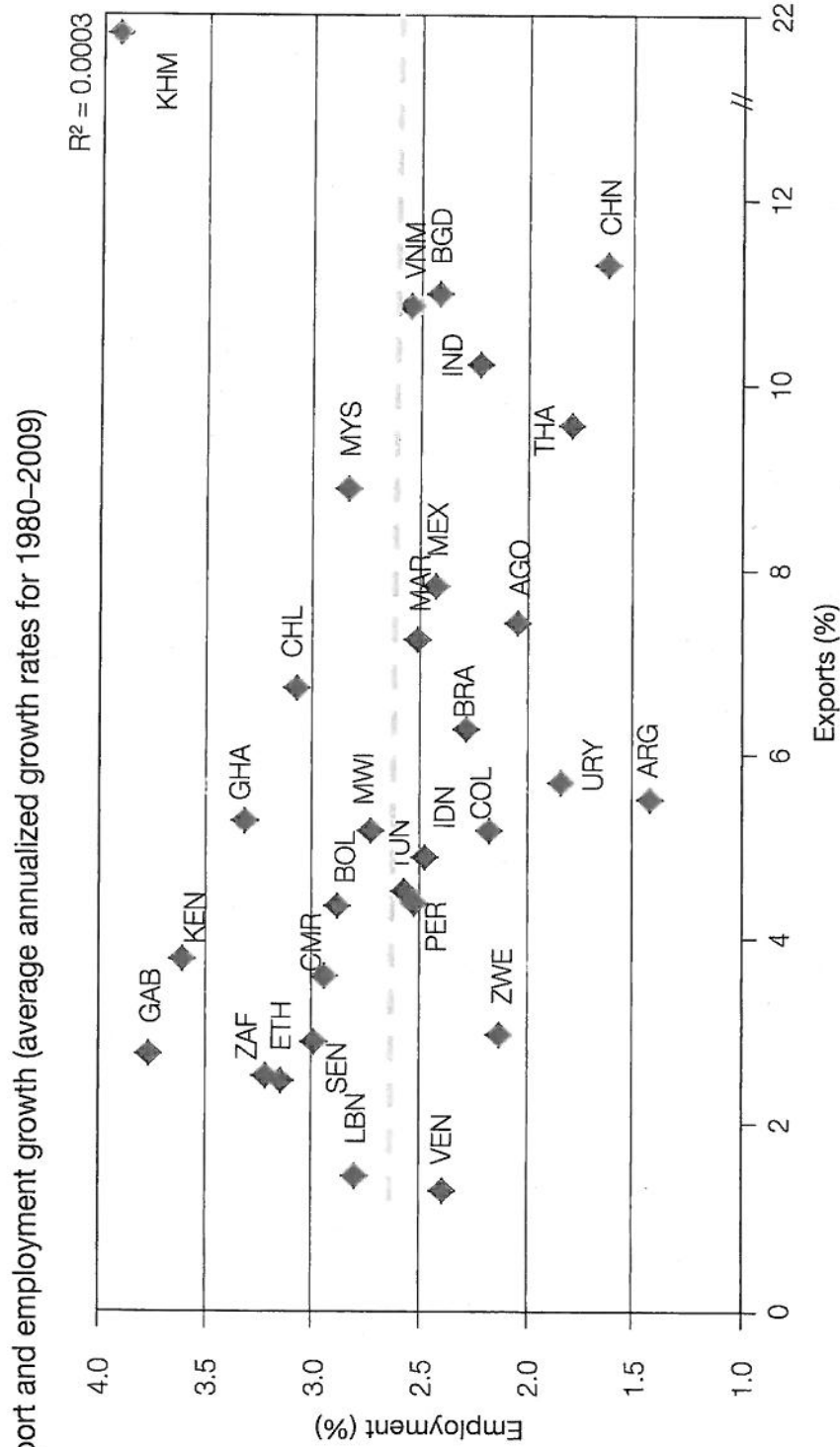
active use of EPZs in East Asia, Central America and the Caribbean has been widely studied since they were created in the 1970s and 1980s. Today there are over 90 EPZs in sub-Saharan Africa and in the transition economies of eastern and central Europe, which, in some cases, account for a significant share of country exports (Gabon, Ghana, Kenya, Lesotho, Mali, Mozambique, Nigeria, Zimbabwe, the Czech Republic and Lithuania).

Indeed, EPZs continue to contribute a major share of national exports in many countries, sometimes upwards of 80 per cent. Costa Rica's EPZs accounted for 10 per cent of manufactured exports in 1990 and up to 50–52 per cent in the early 2000s (Engman, Onodera and Pinali, 2007, p. 26). Bangladesh saw the share of its EPZ exports rise from 3.4 per cent in 1990 to 21.3 per cent in 2003 (Aggarwal, 2005, table 7.6). A number of countries experienced a decline in the share of their EPZ exports, including Mauritius, Mexico, Philippines and Tunisia. In some cases this was caused by heightened competition in global apparel trade resulting from the phase-out of textile and apparel quotas. In Mexico, another contributing factor was the expansion of non-EPZ-based exports, particularly in electronics.

At the simplest level – a bivariate correlation for the period 1980–2009 – higher exports are not associated with higher employment (figure 3). While all countries show positive export and employment growth, we observe some interesting differences. Asian and Latin American countries show high export growth rates, but lower employment growth, while African economies experienced lower export growth, but stronger growth in employment. When we drop the outlier, Cambodia (KHM), the relationship, in fact, turns negative. However, this surprising finding is based on the selection of 30 countries only. Moreover, when we shorten the sample by dropping the recent economic downturn, the relationship turns slightly positive (available upon request).

If the relationship between export and employment is weak or negative, what about the reverse relationship? Stated more generally, the question is: Does social upgrading adversely affect international trade performance? Social upgrading (i.e. higher pay and/or labour standards) is typically thought to raise production costs.⁸ If adopted in one country, such upgrading should reduce that country's international competitiveness. Recent research shows that this conventional wisdom is not supported by the evidence from a broad sample of developing countries. Kucera (2001) models labour costs and foreign direct investment flows as a function of a series of indicators of core labour standards for a sample of 127 countries. His results fail to confirm the conventional wisdom that adherence to higher labour standards raises labour costs and reduces inward foreign direct investment. A number of recent studies also find that higher social standards do not adversely impact export performance (see, for example, Kucera, 2001;

⁸ See, for example, Culem (1988); Friedman, Gerlowski and Silberman (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 the Republic of Korea and Taiwan (China); Busse and Spielman, 2006, for a sample of 92 countries).



Note: Exports at 2005 prices.

Sources: Own illustration. Data: UNCTAD: Handbook of statistics; World Bank: World Development Indicators; Groningen Growth and Development Centre: Total Economy Database.

Kucera and Sarna, 2004; Barry and Reddy, 2008). 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 arising from improved pay and working 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 and 1999) argues that globalization (trade expansion) led to a rise in female labour force participation relative to male participation, because women were being employed in increasingly large numbers by firms competing on the world market for labour-intensive, low value added goods, as a means to reduce costs. For example, EPZ employment in a number of countries is predominantly female. Recent evidence suggests that while there has been a process of "defeminization" of manufacturing labour in several East Asian countries, there has been continuing feminization of such labour 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 industries and higher-tech niches within their traditional industries, the relative incidence of female employment has fallen. They attribute this to a combination of skills mismatch and continued segregation of higher-skill occupations.

Amidst all the analysis of GVCs, one should not lose sight of important macroeconomic determinants of social upgrading. Economic upgrading is more likely to translate into social upgrading in any given industry under conditions of rapid aggregate demand growth, particularly in global demand. This would imply a high correlation of upgrading across industries within countries. In other words, in all likelihood there are important country effects in all aspects of upgrading, and these may swamp the considerations specific to a particular GPN (Wood, 2001, emphasizes this point).

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. increasing 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 relationship between economic and social upgrading. As is often the case in economics, however, there are competing theories – neoclassical and institutionalist – and no clear consensus on which theory is better. Let us 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 labour market by the supply of and demand for labour. Given a particular labour supply, the focus of the theory is on labour demand, which comes from

profit-maximizing firms based on their calculation of the marginal revenue generated by labour, as follows:

$$W = MRP_L = MP_L P_x \quad (6)$$

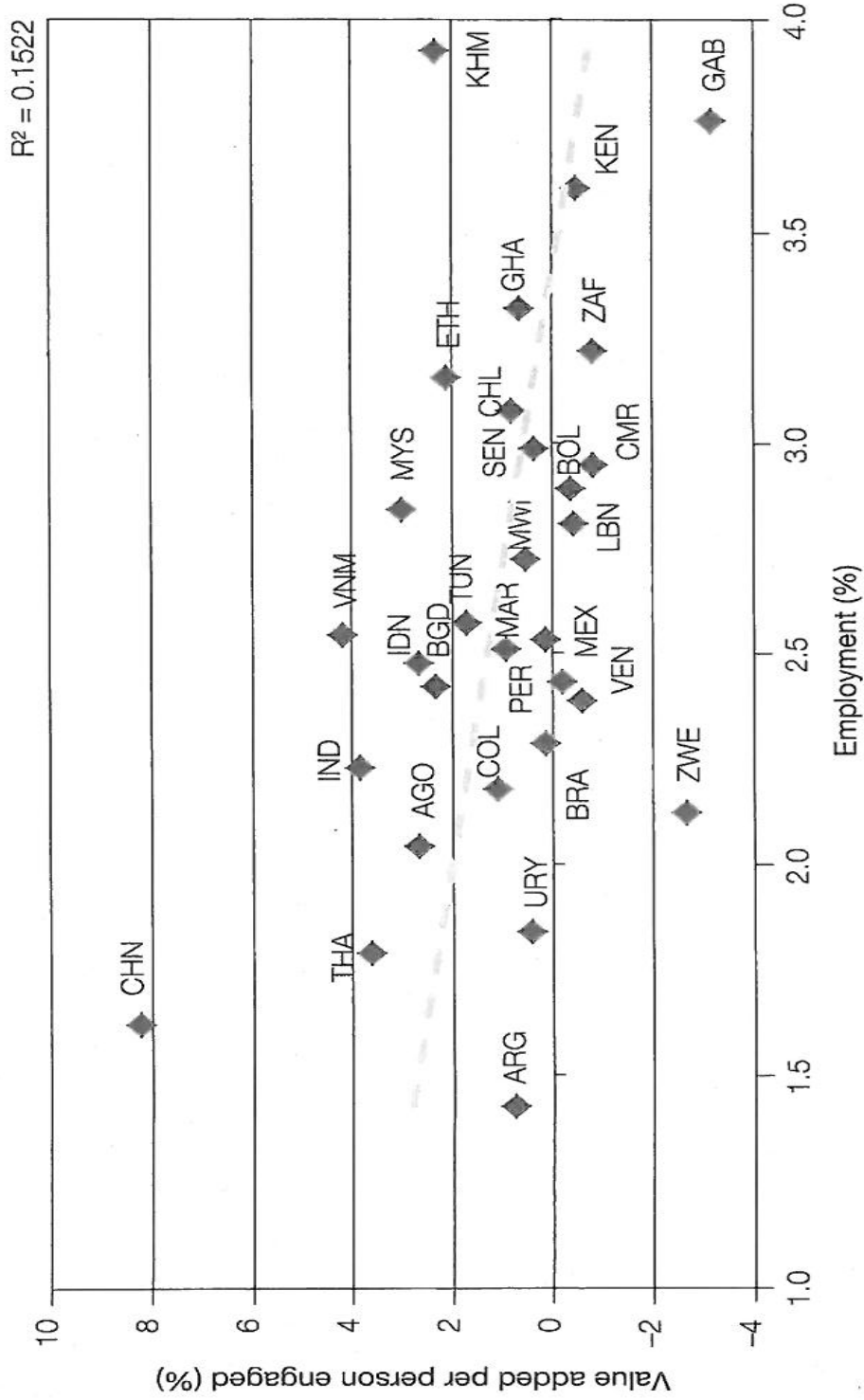
where W is the wage, MRP_L the marginal revenue product of labour, MP_L the marginal product of labour and P_x the market price of the good (X) produced. According to this relation, wages are a function both of the marginal productivity of labour and of the product market price of labour's output. This implies that wages rise as the marginal productivity of labour rises, assuming the price of the good produced remains constant. For our purposes here, the theory implies that, other things being equal (labour 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 has been considerable debate, especially in recent years, over the link between productivity growth and wages. Studying a sample of about 100 developing countries, Flanagan (2006) finds a very tight statistical fit between productivity gains and wage growth in manufacturing. This finding supports 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 United States, over the past 20 years median wages have been relatively stagnant as productivity growth has continued to rise at 1–3 per cent per year (Mishel, Bernstein and Shierholz, 2009); and Mexico has experienced an even more dramatic gap between productivity growth and wages (Palma, 2006). 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 (2006) findings, but it does raise questions about the extent to which social upgrading can be accomplished through trade liberalization.

The main alternative to the neoclassical theory of labour markets is an institutionalist approach, in which wages are understood to be a function of the bargaining power of labour versus management, and in which labour market regulations and their enforcement play an important role in determining outcomes. Union density, bargaining rights, minimum wages and active labour market policies have been found to be significant determinants of labour market outcomes in developed and developing economies (on developed countries, see Howell, 2005; on developing countries, see Berg and Kucera, 2008). 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 that the connection between economic and social upgrading is somewhat weaker than the connection between export growth and economic upgrading. Figure 4 shows the relationship between growth in value added per worker and growth in employment. The OLS regression line slopes negatively – indicating that higher growth

Figure 4. Growth in value added per person engaged and employment (average annualized growth rates for 1980–2009)



Note: Value added at 2005 prices.

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

in value added per worker is associated with lower employment growth.⁹ Employment, too, can be a deceptive measure of social upgrading, since it does not account for the quality of work, conditions of employment or the degree of informal or unpaid labour.

Labour monitoring and the endogeneity debate

In addition to the extensive evidence on upgrading at the national and sectoral levels, there is an accumulating body of research on the monitoring of labour standards by civil servants (Piore and Schrank, 2006 and 2008; Seidman, 2007), by NGOs (Barrientos, 2008) and by firms themselves (Locke and Romis, 2006; Locke, Qin and Brause, 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 labour monitors in the Dominican Republic have used a variety of techniques to make a marked difference on labour standards there. Locke, Qin and Brause (2006) conclude that Nike's "management audit" had a minimal and inconsistent impact on labour standards over repeated audits. Locke and his co-authors find 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 labour 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 labour demand and (other things equal) higher wages.

These two perspectives on social upgrading not only indicate very different research programmes, 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 labour standards (e.g. child labour) are a function of per capita income and that others (e.g. freedom of association and collective bargaining rights) are not (see also Polaski, 2008).

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

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

of the relation between economic growth or upgrading and social upgrading in GPNs.

First, 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 industry-level (or firm-level) research with macroeconomic analysis. The theoretical tension is between neoclassical and institutionalist approaches: 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 relationship.

Second, there is a need for careful thinking about the link between economic and social upgrading. This means 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 (across the spectrum, see Flanagan, 2006; Piore, 2004; Reinert, 2007). 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 industry 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.

Third, the link between international trade expansion and social upgrading should also be carefully analysed. Conventional wisdom has it that higher pay and labour standards raise costs and reduce international competitiveness. Yet a number of recent studies have found that higher social standards do not adversely impact export performance (see, for example, Kucera, 2001; Kucera and Sarna, 2004; Barry and Reddy, 2008). While this runs counter to standard trade theory, it should be noted 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 to remain specialized in low value added goods.

Fourth, there is a need for a theory of “downgrading”. Our cross-country results are consistent with many findings to the effect that most countries and industries 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, have potentially important policy implications. In particular, a 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 policies alone will be inadequate to accomplish social upgrading, and such policies as improving labour standards and regulations, and the capacity to enforce them, should become a priority. If, as some have suggested, there are aspects of social upgrading that are income driven, and others that are not, 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 promote.

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