Does Industrial Upgrading Generate Employment and Wage Gains?

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1. Introduction

As production of goods and services in the late twentieth century increasingly became organized within international networks – with lead firms coordinating suppliers, logistics and marketing in multiple locations – the path of economic development has changed. Economic development has become associated with "industrial upgrading" within these networks, sometimes called "global value chains" (GVCs). The internationalization of production brings new opportunities and new challenges for the improvement of living standards in low- and middle-income countries.

Gereffi (2005: 171) defines economic upgrading as "the process by which economic actors – firms and workers – move from low-value to relatively high-value activities in global production networks". Economic upgrading has been studied in hundreds of country cases, ranging from Brazilian shoe production to Kenyan green beans to Mexican blue jeans and computers to Mauritian t-shirts to Chinese auto parts.[2] This case study literature identifies many successes and some failures of economic development within this new global production structure. It also shows that economic upgrading is a multi-faceted and complex process, involving changes in business strategy, production structure and technology, policy and the organization of markets.

The case studies raise a number of questions. The first is simply how widespread is economic upgrading? The case study literature possibly suffers from a bias toward examples of successful upgrading. Such a selection bias problem would skew any general conclusion from the case studies. It would also indicate a lack of analysis of failed efforts at upgrading.

A second question – and the main focus of the present paper – is about the social consequences of economic upgrading. Does economic upgrading necessarily and quickly translate into improvements in employment, wages and labor standards? Simply raising productivity or value added per person in a sector says little about how the gains from economic upgrading are distributed and thus how social welfare and, ultimately, economic development, are affected. Barrientos, Gereffi and Rossi (forthcoming) refer to the distribution of gains from industrial upgrading in global production networks as "social upgrading" and they ask, similarly, what the connection is between economic upgrading and social upgrading. While most research presumes that economic upgrading leads directly to social upgrading, this connection has not generally been analyzed in a systematic fashion and there is ample evidence that there is considerable slippage from the "cup" of economic upgrading – gains in productivity or exports – to the "lip" of social upgrading – wages, labor standards and environmental standards. Milberg and Winkler (forthcoming) present aggregate data for 30 developing countries that finds a fairly weak link between economic and social upgrading. In addition, they find that economic upgrading is not the norm in most countries, and that there are

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[2] For a review, see Milberg and Winkler (forthcoming).

clear cases of economic and social "downgrading" associated with participation in global value chains.

The globalization of production within global value chains has raised the volume of international trade relative to economic activity and especially of trade in intermediate goods and services. Thus our analysis connecting economic and social upgrading raises the additional question of how improved international trade competitiveness of a sector translates into social gains. That is, does improved export performance drive social upgrading?

In this paper we begin to address these issues by taking a parsimonious and operational approach to economic and social upgrading. The goal is to get an idea about whether selected countries experience economic and social upgrading or downgrading in selected sectors of their economy and whether there is a connection between developments in the economic sphere on the one hand and the social sphere on the other.

As part of the "Capturing the Gains" research project[3], we focus on four sectors – apparel, horticulture, mobile phones and tourism – and on 8-10 developing countries that operate in each of the sectors. Our analysis of economic and social upgrading relies entirely on published data on trade and labor markets for the period 1990-2009.

We define economic upgrading in terms of trade performance and social upgrading in terms of employment and wage growth. While these are admittedly narrow definitions, we nonetheless generate a set of rich findings. Regarding economic upgrading we find that in all sectors except for apparel, positive growth in world export market share is generally associated with economic upgrading. However, export market share growth was generally associated with less-than-proportional growth or declines in export unit values. Regarding social upgrading, the general pattern was of employment growth and considerably less growth of real wages.

Contrary to the spirit of much case study of global value chains, our analysis using published data and an admittedly parsimonious definition of uprgrading shows that economic downgrading and social downgrading are both fairly regular occurences, with social downgrading more common in particular because of stagnant real wages.

Contrary to standard economic theory on the relation between productivity growth and wage growth, we found that there is a variety of patterns across GVCs in the relation between economic and social upgrading: In apparel and horticulture we generally find a positive correlation between economic upgrading and social upgrading. In mobile phones there is widespread economic upgrading without social upgrading. And in tourism we found many cases of social upgrading with less economic upgrading. Overall, economic and social upgrading occured together in only 15-17 out of 30 cases. These results were found to be generally robust across a few alternative techniques for measuring upgrading and downgrading.

This paper has six sections. In Section two, we define economic and social upgrading and describe the general framework for mapping their relation to each other. In Section three we summarize the evidence on economic upgrading and downgrading, and in Section four we do the same for social

[3] For an overview of the project, see Barrientos et al. (forthcoming) and the project website at www.capturingthegains.org.

upgrading and downgrading. In Section five we present the evidence on the interrelation between the economic and social realms, and Section six concludes.

2. A parsimonious approach to economic and social upgrading in global value chains

Social upgrading can be understood as a process of improvement in the entitlements and rights of workers as social actors which enhances the quality of their employment (Sen 1999, 2000). From this perspective, social upgrading involves the advancement of employment based on decent work and respect for labor standards. At the same time, access to better work as just described might actually result from economic upgrading (Barrientos et al., forthcoming). These are very broad definitions. To operationalize these concepts given available data, we propose a parsimonious approach to the study of the economic and social upgrading, as follows: A country is said to experience economic upgrading in a given sector when the following two necessary conditions are fulfilled:

(1) there is an increase (or at least no decrease) in the world export market share (i.e. its exports are internationally competitive);

(2) there is an increase in the export unit value, implying the production of higher-value products in the sector concerned.

According to the typology developed in the recent research on global value chains (see, for example, Humphrey/Schmitz 2002, Humphrey 2004, or Gereffi et al. 2005), progress on these two indicators reflects "product upgrading" or "functional upgrading". In any case, it is important to include *both* dimensions in our analysis to capture economic upgrading more adequately. This is also along the lines of the argument brought forward by Kaplinsky and Readman (2005: 682): "Firms which engage in successful product innovation (…) can expect to receive relatively higher prices for their output. (…) Higher prices may also reflect inefficiencies in production, suggesting a decline in innovative performance, but in this case with regard to process innovation. Therefore we need an indicator of cost competitiveness." For this purpose, they suggest the use of export market shares which, in combination with the first indicator (export unit values), gives a more complete and reliable picture about whether a sector experiences upgrading or not.

Social upgrading is defined to occur in a given sector when the following two necessary conditions are fulfilled:

(1) there is an increase (or at least no decrease) in employment;

(2) there is an increase in real wages (and/or an improvement of labor standards).

The motivation for the choice of these indicators is straightforward: The major contribution a sector of production can make to social well-being is the creation of jobs, thereby giving labor the possibility to earn income. However, such a quantitative treatment of social upgrading in terms of employment generation alone is not enough. What also matters is the *quality* of jobs (created or retained). This is to be captured by including real wages into our analysis. In a sense, their remuneration is a measure of how much workers benefit from the value created by economic activity in the different sectors. It

gives an idea of how much of the (sectoral) value added generated is appropriated by workers. [4] An even more nuanced picture of social upgrading would require the inclusion of labor standards into our analysis. However, given that published data on this issue are hardly available (particularly at the sectoral level), this is an endeavor that we leave to future research.

3. Economic upgrading in the four sectors

In this section we provide an overview of economic upgrading in the four sectors under study over the last twenty years. In the next section we turn to social upgrading. The complete time series for all the component variables in economic and social upgrading are reported in Bernhardt and Milberg (2011: Appendices 2 to 5). In this section we present the data for the two economic upgrading indicators and highlight interesting and important patterns and trends. We consider each sector separately.

Sector selection was guided by the desire to have variety in terms of technological intensity. The four sectors and their technological profile are as follows:

- Horticulture/agro-foods (as an example of a commodity-based/low-tech sector),
- Apparel (as an example of a medium-tech and labor-intensive sector),
- Mobile telecommunication/mobile phones (as an example of a high-tech sector), and
- Tourism (as an example of a service sector).

In each of these sectors, we analyzed a slightly different set of developing countries. The selection of countries was guided by the idea of including the major developing countries for each sector and for each continent, e.g. China, India, Mexico, or South Africa. The rest of the countries were chosen to reflect a balanced regional distribution with a certain emphasis on those countries that have an established link with the lead firm or key supplier firms in the global value chain. A full overview of the countries in the sample is provided in Appendix 1. In Appendix 2 we give the precise definition of each of the sectors in terms of product coverage/product categories. The analysis draws on the following international data sets:

- UN Comtrade (exports, unit values)
- UNCTAD Handbook of Statistics (tourism exports, unit values)
- UNIDO INDSTAT4 (employment, earnings)
- ILO Laborsta and ILO KILM (earnings)
- World Travel & Tourism Council (WTTC) Economic Data Search Tool (employment)

As noted above, a country is considered to experience economic upgrading in a given sector when two conditions are fulfilled: 1) there is an increase (or at least no decrease) in the country's world export market share; and 2) there is an increase (or at least no decrease) in the export unit value. Looking at changes over time ensures that the dynamic nature of upgrading (or downgrading) as a *process* is captured – as opposed to earlier practices using *static* indicators of innovative progress (i.e. up- or downgrading) (Kaplinsky/Readman 2005: 680). Below we present the percentage change

[4] Our definition of social upgrading borrows to some extent from the International Labor Organization's "decent work" framework which emphasizes not only the protection of rights at work, the promotion of social dialogue and the extension of social coverage but also the generation of employment and the provision of adequate remuneration (see, for example, ILO 1999).

from 1990 to 2009 in both the world export market share and the export unit value for all the countries in our sample and for each of the four sectors, beginning with the horticulture sector.

3.1 Horticulture

The top three horticulture exporters in terms of world export market share are all developed countries but about half of the top fifteen exporters come from the developing world. Latin America plays a dominant role in this regard: one third of the top-15 horticulture exporters are either Central or South American economies, the most important being Mexico, followed by Chile, Ecuador, Colombia, and Costa Rica. Other important horticulture exporters from the developing world include China (with the fifth-largest export market share) and Turkey (tenth).

None of the African countries in our sample plays a really important role in the horticulture sector. The most competitive exporter is Kenya with a market share of 0.44% in 2009 (up from 0.19% in 1990 but down from 0.72% in 2008). Among the Asian countries in our sample, Thailand and Viet Nam are significant players in the horticulture sector with both accounting for more than one percent of the global export market in 2009. However, while Viet Nam was able to increase its world export market share from 0.13% in 1990 to 1.10% in 2009, Thailand lost 0.83 percentage points in the same period of time (from 2.66% in 1990 to 1.83% in 2009). Five of the selected Latin American economies had an export world market share of more than one percent in 2009: Mexico (5.32%), Chile (3.67%), Ecuador (3.12%), Colombia (2.40%), and Costa Rica (2.32%). Moreover, all of them succeeded in increasing their market share since 1990, some of them even substantially.

When using UN Comtrade data, export unit values can only be calculated at a higher (i.e. 4-digit) level of product disaggregation. To give a first example of a horticulture product, export unit values of *cut flowers and dried flowers for bouquets* (HS code 0603) have increased for two-thirds of the countries in our sample during the last 20 years. All the African countries in our sample saw an increase in the unit values of their flower exports between 1990 and 2009, all the Asian countries experienced a decline. Moreover, there are large differences in unit values across countries. While, in 2009, Uganda and Panama sold their flowers abroad for more than US$ 9 per kilogram, Bangladesh and Honduras got less than US$ 1 per kilogram of flower exports.

For *fresh and chilled vegetables* (HS code 0709), however, only one-third of the countries in our sample succeeded in increasing their export unit values while the rest saw stagnating or declining unit values. African countries, again, have been performing quite well, with three out of four (Kenya, Tanzania, Uganda) managing to raise their export unit values while three of the four South American countries in our sample experienced declining unit values (Brazil, Chile, and Ecuador, the only exception being Colombia) and only one of the three Asian countries in our sample (namely Bangladesh) succeeded in increasing their export unit values. *Fresh or dried citrus fruits* (HS code 0805) are exported by all the countries in our sample. While all Asian countries and three out of four African countries in our sample could lift the unit values of their citrus fruit exports, all Central American countries (except for Panama) and half of the South American countries saw their export unit values deteriorate. In general, Central American countries sell their citrus fruits very cheaply: In 2009, Nicaragua, Costa Rica, and Honduras earned a mere 0.07 US$/kg, 0.12 US$/kg, and 0.16 US$/kg, respectively. Other low earners include Ecuador (0.13 US$/kg) and Kenya (0.19 US$/kg). Their revenues contrast with those of Bangladesh, Ethiopia, and Uganda that, in 2009, exported their citrus fruits for more than 2.0 US$/kg.

According to our definition of economic upgrading, six out of 19 countries managed to upgrade in the horticulture sector between 1990 and 2009 (see Table 1). Among them, Uganda is the most impressive success story, increasing its market share 78-fold (albeit from very low levels in the early 1990s) and its export unit values six-fold during the last 20 years. Two other African countries also stand out as excellent performers: Ethiopia and Kenya. Both were able to more than double the unit value of their horticulture exports while increasing their market shares more than seven-fold and three-fold, respectively. In Latin America, Chile and Ecuador were the only clear economic upgraders from 1990 to 2009, the latter recording an impressive growth in the unit values of its exports of 150% during this period. However, looking at a shorter and more recent time period (2000-2009) reveals that Brazil, Mexico and Nicaragua also experienced clear economic upgrading during the last decade.

For the longer time period, the only country whose horticulture sector experienced clear economic downgrading was Thailand, losing almost 40% of its market share and seeing its export unit values decrease by a quarter over 1990-2009. Interestingly, in the 2000s, Thailand experienced clear economic upgrading, increasing both its market share and its export unit values by more than 10%, so it seems that the Thai horticulture sector suffered during the 1990s but recovered during the last decade. Among the Asian countries in our sample, only Bangladesh established itself as a clear upgrader in the horticulture sector. Viet Nam, on the other hand, impressively managed to more than sextuple its market share – albeit at the cost of declining export unit values (-75%). It is therefore an intermediate or mixed case, having done well on one front (export market share) but rather poorly on the other front (export unit values). At the same time, the Central American countries El Salvador, Honduras, Nicaragua and Panama lost market shares but increased their export unit values, while Brazil, Colombia, Costa Rica, Mexico, Tanzania and Viet Nam had market share gains but export unit value losses.

Table 1: Economic upgrading in horticulture, 1990-2009

	Growth (in %) Market Sh.	Growth (in %) Unit Value
Economic Upgraders		
Bangladesh	276.04	47.32
Chile	23.06	53.87
Ecuador	13.59	149.99
Ethiopia	656.11	176.28
Kenya	228.39	113.44
Uganda	7,835.38	529.47
Economic Downgraders		
Thailand	-39.93	-24.52
Intermediate Cases		
Belize	2,148.48	-42.66
Brazil	71.08	-29.25
Colombia	7.45	-26.76
Costa Rica	15.66	-24.02
El Salvador	-24.95	86.14
Guatemala	48.59	-40.19
Honduras	-53.40	5.21
Mexico	42.97	-30.90

Nicaragua	-2.26	93.29
Panama	-70.03	20.26
Tanzania	5.39	-82.90
Viet Nam	549.93	-75.09

Source: Authors' own calculations based on data from UN Comtrade

3.2 Apparel

Apparel production has been much debated as a catalyst for economic development and developing countries are among the major exporters of apparel products. Four of the top five (China, Bangladesh, Turkey, and India) and nine of the top fifteen apparel exporting countries in terms of world export market share are developing countries. Almost all of them are Asian: Besides the four economies already mentioned the ranking also includes Viet Nam, Indonesia, and Sri Lanka. The only other developing countries that made it into the top-15 exporters ranking are Mexico (with the eleventh-largest export market share) and Tunisia (the world's number thirteen).

None of the African countries has succeeded in establishing itself as major exporter in the apparel sector. The most competitive African exporter in 2009 was Mauritius with a market share of 0.31% (yet down from 0.33% in 1990). The remaining three African economies in our sample have gone through opposing experiences: While South Africa has dramatically lost market share (from 0.20% in 2000 down to 0.03% in 2009), Kenya (up from 0.001% in 1990 to 0.085% in 2009) and Lesotho (up from 0.08% in 2000 to 0.12% in 2009) have been among the biggest winners. As already mentioned, all the Asian countries in our sample are important players in the apparel sector; even Cambodia, the only Asian economy that did not make it into the top-15, has a market share of 1.3%. Strikingly, all of them have continuously increased their market shares, both in the 1990s and in the 2000s. Meanwhile, apparel exports of the Latin American and Caribbean countries in our sample have also gone up significantly, even though none of them (except for Mexico) has a market share above 1%. However, considering their (economic) size, several Central American and Caribbean countries had quite impressive export market shares in 2009: El Salvador (0.57%), Guatemala (0.50%), Nicaragua (0.39%), the Dominican Republic (0.27%), and Haiti (0.23%), all of them up from extremely low levels.

As with the horticulture sector, it is hard to make general observations on export unit values. Table A.3.2 in the appendix to Bernhardt and Milberg (2011) reports how export unit values have changed between 1990 and 2009 for each country's top-10 apparel products at the 4-digit level of product disaggregation. In the apparel sector generally speaking there has been much more market share growth than export unit value growth. One interpretation would be that low unit values are required for gains in market share – a downward sloping product demand curve. In any case, more than half of all the countries in our sample (nine out of sixteen) experienced clear economic upgrading from 1990 to 2009 (see Table 2). The most outstanding cases are Cambodia, Kenya, and Viet Nam, having increased their export market shares 55-fold, 8-fold, and 13-fold, respectively. In this time period, Cambodia and Viet Nam managed to elevate their market shares to over 1% of world exports (1.3% and 3.3%, respectively) up from a low 0.02% and 0.20%, respectively. Cambodia was, moreover, able to combine this with a considerable rise in its apparel export unit value of 54% whereas Viet Nam's exports gained a mere 1.35% in value per unit between 1990 and 2009. In fact, the best performer in this regard has been Guatemala whose export unit values more than doubled during the last 20 years

– allowing it to increase its world export market share by almost 40%, apparently in higher-value segments. Other unambiguous economic upgraders include the Asian powerhouses China and India as well as Bangladesh, Sri Lanka, and Mexico. Remarkably, a significant part of this overall upgrading of these countries over 1990-2009 seems to have occurred in the first half of this period, i.e. in the 1990s. Only four of the nine countries (Bangladesh, Cambodia, India, and Kenya) figure among the list of clear economic upgraders if one looks at the shorter and more recent time period 2000-2009.[5] China, on the other hand, had a mixed experience in the 2000s with its market share still growing by 57%, yet its export unit values falling by 6%.

None of the countries in our sample experienced clear-cut economic downgrading in the apparel sector over the entire period. However, this is not true for the 2000s when El Salvador and Guatemala somewhat reversed their good performance from the 1990s and lost both export market shares and export unit values. Another notable case is Nicaragua whose export market share shot up by a stunning 17,000% from 1990 to 2009 (with a significant slowdown of market share gains in the second half of the period) – on the back of a simultaneous decrease in export unit values of 16%. What is also interesting to note is that, except for Kenya, all the African countries in our sample (Lesotho, Mauritius, and South Africa) are intermediate cases with a common pattern: While all of them succeeded in enhancing the unit values of their exports, they did so at the expense of markets shares which dropped by 2% (Lesotho), 16% (Mauritius), and 67% (South Africa), respectively.

Table 2: Economic upgrading in apparel, 1990-2009

	Growth (in %) Market Sh.	Growth (in %) Unit Value
Economic Upgraders		
Bangladesh	373.89	16.86
Cambodia	5,539.65	53.88
China	163.94	13.25
Guatemala	37.46	128.54
India	63.86	10.96
Kenya	791.80	35.40
Mexico	80.04	15.56
Sri Lanka	47.71	45.69
Viet Nam	1,307.10	1.35
Economic Downgraders		
-		
Intermediate Cases		
Dominican Rep.	-67.34	18.39
El Salvador	387.33	-27.62
Haiti	80.44	-20.42
Lesotho	-2.03	14.93
Mauritius	-15.60	12.71
Nicaragua	16,970.36	-15.86
South Africa	-67.31	82.95

Note: Time span covered is 2000-2009 for Lesotho and South Africa

[5] For details on the exact figures for all countries for 2000-2009, see Bernhardt and Milberg (2011: Table A.3.4).

Source: Authors' own calculations based on data from UN Comtrade

3.3 Mobile telecom

There are only four developing countries among the 15 leading exporters in the sector. These four countries, however, occupy top spots, with China and South Korea ranking first and second while Mexico and Malaysia are the world's fifth and ninth-largest exporters. Apart from these exceptions, the technology intensity of the mobile telecom sector guarantees that the world market is dominated by exports from the advanced economies, and the huge majority of the countries in our sample play very small roles as exporters. It is important to note that we have not included the raw materials such as coltan in our definition of the mobile telecom sector, thus understating the importance of developing countries within the global value chain.[6]

Changes in market shares over the last 20 years were relatively minor for most Latin American and Caribbean countries. The notable exceptions are the two most competitive exporters, Mexico and Brazil, that both have managed to increase their market shares quite substantively since 1990. Meanwhile, mobile telecom exports from almost all the Asian countries in our sample have gone up significantly – and today some of them are important players, as already mentioned. The stellar performer was, of course, China which managed to ramp up its market share from 2.5% in 1990 to 37.4% in 2009. Viet Nam and the Philippines represent similar success stories, albeit at much lower levels (reaching export market shares of 0.18% and 0.39%, respectively, in 2009). The two Asian countries in our sample with the largest world export market shares after China, namely Thailand (0.88% in 2009) and India (0.77% in 2009), on the other hand, have experienced up-and-downs: While both gained export market shares in the 1990s, they lost market shares in the 2000s (see Table 3).

Two thirds of the countries in our sample have recorded an increase in the unit values of their mobile telecom exports over the last decade. However, inter-regional differences are quite significant. While 80% of the African countries in the sample succeeded in raising their export unit values since 2000, the same is true for only about half of the Asian and Latin American and Caribbean countries. In Asia, Bangladesh, China, Pakistan, and Thailand where those economies which managed to increase the unit values of their mobile telecom exports while India, the Philippines, Sri Lanka, and Viet Nam saw their unit values decline. In Latin America and the Caribbean, in turn, winners in terms of export unit values included Brazil, Colombia, Costa Rica, Guatemala, Haiti, and Mexico whereas losers included El Salvador, Honduras, Nicaragua, Paraguay, and Peru.

More than 60% of the countries in our sample (18 out of 29) managed to economically upgrade in the mobile telecom sector during the last decade. Several stunning success stories stand out: Brazil, Costa Rica, and Haiti increased both their market shares and their export unit values (often far) more than tenfold. Meanwhile, a number of other upgraders did particularly well on one of the two indicators: Peru and Viet Nam, on the one hand, could expand their market shares 20-fold and 108-fold, respectively (while also approximately doubling the unit values of their exports), whereas China, Ghana, and the Philippines, on the other hand, achieved 14-fold, 26-fold and 21-fold increases in their export unit values, respectively (while also gaining world export market shares). Interestingly, the upgraders include countries from all three (sub-)continents.

[6] On "conflict coltan" and the mobile phone supply chain, see Nathan and Sarkar (2011).

Among the eleven intermediate cases, two countries' experiences are particularly striking: Paraguay succeeded to increase its share in the world mobile telecom market tenfold but saw its export unit values decline by 65%. Thailand, on the other hand, experienced the opposite: The almost nine-fold rise in the unit value of its mobile telecom exports came at the expense of a market share loss of 27%. The only countries that experienced outright downgrading between 2000 and 2009 were Honduras and Nicaragua.

Table 3: Economic upgrading in mobile telecom, 2000-2009

	Growth (in %) Market Sh.	Growth (in %) Unit Value
Economic Upgraders		
Brazil	619.77	918.94
China	418.82	646.93
Colombia	308.51	4.29
Costa Rica	223.85	980.57
Ghana	109.58	19.72
Guatemala	48.57	107.10
Haiti	987.15	20,325.01
India	226.49	207.30
Kenya	116.16	1,022.41
Mexico	53.87	1,636.72
Nigeria	193.06	894.21
Pakistan	237.59	587.40
Peru	568.11	108.65
Philippines	1,431.07	2,463.84
Rwanda	45.40	1,999.95
Sri Lanka	40.62	1,921.25
Viet Nam	4,836.63	143.36
Economic Downgraders		
Honduras	-3.32	-31.42
Nicaragua	-93.51	-26.64
Intermediate Cases		
Bangladesh	-92.39	754.66
Congo, Dem. Rep.	209.33	-45.06
El Salvador	244.93	-92.86
Ethiopia	-85.92	1,615.58
Mozambique	1,212.14	-2.40
Paraguay	1,064.76	-49.58
South Africa	-15.75	128.43
Tanzania	63.96	-9.22
Thailand	-20.08	601.89
Uganda	1,902.18	-3.34

Source: Authors' own calculations based on data from UN Comtrade

3.4 Tourism

On a global scale, developing countries do not (yet) play a leading role as exporters of tourism services. Among the top-15 tourism exporters there are only three developing countries: China is ranked sixth while Turkey and Thailand have the tenth-largest and eleventh-largest world export market shares, respectively. The rest of the ranking is dominated by North American and European countries.

The countries in our sample are, thus, all rather small players in the global tourism industry. Among them, the most important exporter of tourism services is China with a world market share of 4.5% in 2007. Its continuous gains in market share (up from a bit more than 1% in 1990) have actually earned China a place among the top-6 world exporters, only slightly behind the UK. India is the only other Asian country in our sample with a world market share exceeding one percent (namely 1.3% in 2007). After gaining market shares in the first half of the 1990s (from 0.97% in 1990 up to 1.03% in 1994), it dramatically lost market shares until the early 2000s (down to 0.64% in 2002) when it started to regain ground. The same pattern (with market share losses in the 1990s and gains in the 2000s) can actually also be observed for Brazil, Kenya, Jordan, and South Africa. Meanwhile, Costa Rica and Uganda steadily increased their export market shares whereas Indonesia's, Jamaica's, and Nepal's tourism sectors were in continuous decline.

Unlike with commodities whose unit value measure is relatively straightforward, services, and tourism in particular, are not so simple. In view of the data that are available in UNCTAD's Handbook of Statistics 2009, we divided the value of tourism services exports by the number of arrivals of visitors in order to derive a measure for export unit values, namely "travel expenditures per visitor" (in US$). Using this measure of unit values in tourism exports, we find that more than half the countries in our sample experienced declines between 1990 and 2007. Among the African and Latin American and Caribbean countries in our sample, two out of three earned less in travel expenditures per foreign visitor in 2007 than in 1990 (namely Kenya and South Africa, and Brazil and Jamaica). In Africa, the exception to this downward trend is Uganda, while in Latin America the only country where visitors from abroad increased their expenditures is Costa Rica. Among the Asian countries in our sample, three countries experienced a decline in tourism export unit values (Indonesia, Jordan, Nepal) and three countries an increase (China, India, Viet Nam).

Travel expenditures per foreign visitor vary quite significantly across regions and countries. In 2007, India earned by far the most per tourist, namely about US$ 2,000. At the other extreme, in the same year an average visitor to China spent less than a mere US$ 300 on tourism services. Other countries with low export unit values (of below US$ 400) include Jordan, Kenya, and Nepal where travel expenditures per visitor in 2007 were US$ 354, US$ 373, and US$ 380, respectively. High earners in the tourism sector, on the other hand, include Brazil, Indonesia, and South Africa where foreign visitors spent, on average, US$ 985, US$ 970 and US$ 917, respectively.

Strikingly, during 1990-2007 all countries in our sample experienced either clear economic upgrading or clear economic downgrading in their tourism sectors (see Table 4). Five countries experienced upgrading and seven experienced downgrading.

Table 4: Economic upgrading in tourism (1990-2007)

	Growth (in %) Market Sh.	Growth (in %) Unit Value
Economic Upgraders		

China	314.29	70.31
Costa Rica	37.68	34.53
India	33.14	124.11
Uganda	184.52	117.46
Viet Nam	64.27	54.95
Economic Downgraders		
Brazil	-30.74	-22.26
Indonesia	-51.98	-1.78
Jamaica	-50.97	-12.93
Jordan	-12.54	-60.38
Kenya	-62.19	-34.71
Nepal	-64.54	-11.27
South Africa	-11.04	-48.59
Intermediate Cases		
-		

Note: Time span covered is 1993-2007 for Uganda and 2003-2006 for Viet Nam
Source: Authors' own calculations based on data from UNCTAD's Handbook of Statistics 2009

3.5 Economic Upgrading: A Summing Up

Using a parsimonious and operational definition of economic upgrading reveals considerable variation across our four sectors. Economic upgrading is the norm in the apparel and telecom sectors – in the apparel sector, there has not been a single case of clear-cut economic downgrading over 1990-2009 while in the mobile telecom sector there has been just one such case. In horticulture and tourism, the picture is less rosy. In horticulture, while there has been only one case of unambiguous economic downgrading (and a few instances of clear-cut economic upgrading), the bulk of countries have not succeeded in advancing on *both* fronts (i.e. in terms of world market share *and* export unit values). Meanwhile, the tourism sector has offered the fewest prospects for economic upgrading for the developing countries in our sample over 1990-2007. The majority of sample countries experienced economic downgrading.

Variations in performance across sectors can also be observed for single countries that figure in the samples of various sectors. Brazil, for example, experienced clear-cut upgrading in the mobile telecom sector but clear-cut downgrading in the tourism sector (while being an intermediate case in horticulture). China and India, in turn, have succeeded to upgrade in *all* the sectors where their performances were analyzed (namely apparel, mobile telecom, and tourism). The same is true for Bangladesh (in horticulture, apparel, and mobile telecom). Other general success stories include Mexico (clear-cut upgrading in apparel and mobile telecom and a mixed performance in horticulture) and Viet Nam (clear-cut upgrading in apparel, mobile telecom, and tourism and a mixed performance in horticulture). South Africa, on the other hand, has done rather poorly overall: While none of its sectors managed to upgrade, its tourism sector witnessed economic downgrading while its apparel and mobile telecom sectors were among the intermediate cases.

Looking at our two indicators of economic upgrading separately, it can be observed that, in general, achieving gains in export market share has been easier than achieving increases in export unit value. As a consequence, export market share growth has generally been associated with less-than-proportional growth or even declines in export unit values. In conclusion, it can be said that

economic upgrading is not the norm and more difficult than indicated by the case study literature which often focuses on success stories (Milberg and Winkler, forthcoming).

4. Social upgrading in the four sectors

We now turn to the issue of social upgrading and downgrading in the four sectors. According to our definition (outlined in Section 2) a country experiences social upgrading in a given sector when two conditions are fulfilled: 1) there is an increase (or at least no decrease) in employment; and 2) there is an increase in real wages. We calculated the percentage change in these variables from the early 1990s to the late 2000s for all the countries in our sample. Analysis of social upgrading and downgrading is more difficult than the analysis of the economic realm due to significant data gaps. For various countries and years data are very scarce or not available at all. For the horticulture sector, we did not succeed in finding meaningful data on sectoral employment.

4.1 Apparel

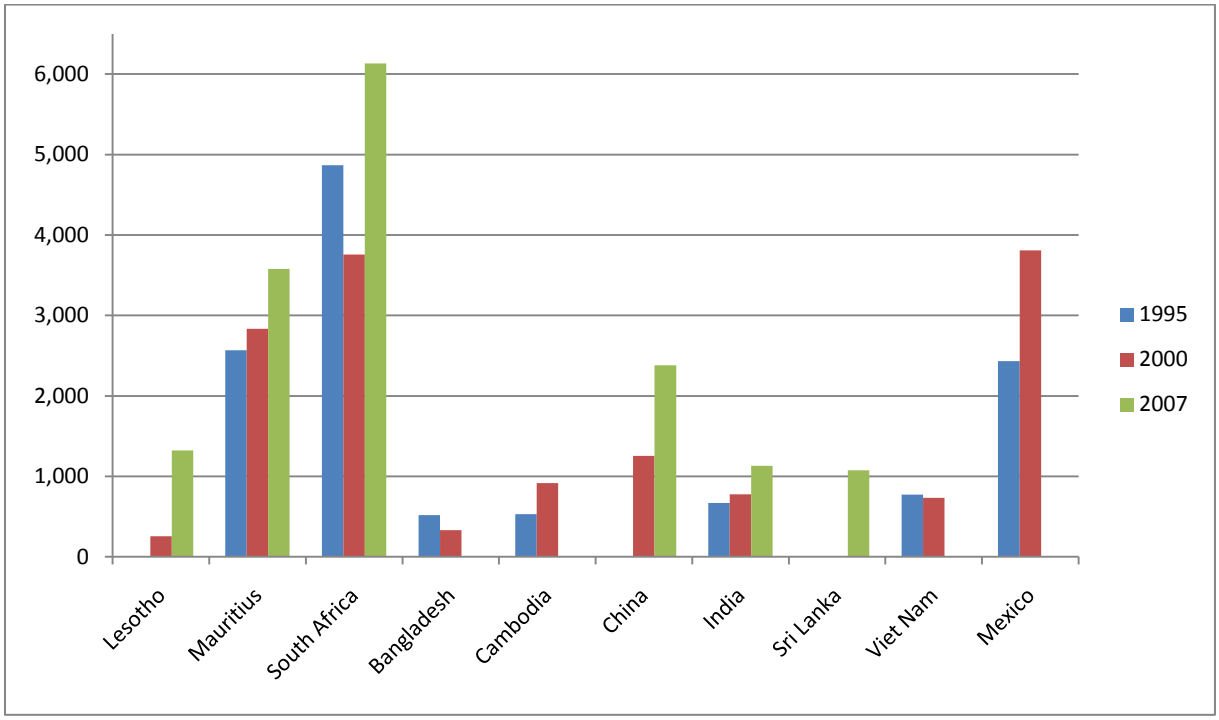
Social upgrading data are particularly scarce for Latin American and Caribbean economies. In fact, the only country for which data are available is Mexico. In 2003, the latest year for which data are available, the Mexican apparel sector employed 406,000 workers – an almost tenfold increase from 1994, the earliest year for which data are available. This figure falls well short of employment numbers for the Asian economies in our sample where the apparel sector appears to play a much more important role.

The Chinese apparel sector is the largest in terms of employment in our sample, employing almost 5.5 million people in 2007, up from 3.5 million in 2003. In Bangladesh, close to a million people were working in apparel production already in 1998 (the latest year for which data are available), up from 720,000 workers in 1993 (the earliest figure available). Most recent data show that the apparel sector gave employment to 706,000 people in Viet Nam (in 2007), 540,000 people in India (2005), 482,000 people in Sri Lanka (2006) and 169,000 people in Cambodia (2000). All of these countries actually registered quite significant increases in the number of jobs over the last ten to twenty years. This starkly contrasts with the experience of the African countries in our sample. Apparel sector employment in South Africa went down to 64,000 in 2007 from 109,000 jobs in 1993. In Mauritius, employment fell to 51,000 in 2007 from 67,000 ten years earlier. In Lesotho, employment fell to 27,000 from 51,000 over that same period. Interestingly, Lesotho still managed to increase its market share in world exports (see above) – whereas in Mauritius and South Africa the decline in employment occurred as world export market shares declined.

While total employment levels in apparel are lowest in the African countries in our sample, real wages are highest, as can be seen in Fig. 1. An employee in the South African apparel sector, on average, earned US$ 6,100 a year in 2007, up from US$ 5,000 in 1993, while the average annual wage of his or her counterpart in Mauritius was US$ 3,600 in 2006, up from US$ 2,600 in 1997. The only exception in our sample to these high wages paid in African apparel production is Lesotho where in 2007 an average worker earned merely US$ 1,300 per year, up from US$ 256 in 2001 but down from the peak of US$ 1,700 in 2005. However, this was still much more than the wages that were paid in various South Asian and Southeast Asian countries: The average annual remuneration was US$ 332 in Bangladesh (in 1998), US$ 734 in Viet Nam (in 2000), US$ 918 in Cambodia (in 2000),

and US$ 1,133 in India (in 2005).[7] In the medium range, we find China, where the average annual wage in 2007 was US$ 2,400, and Mexico, where the average annual wage in 2003 was US$ 2,600. In terms of changes over time, most countries have witnessed an increase in average (nominal) wages since the 1990s, most notably Lesotho, China and India. In Mexico, on the other hand, a typical worker in the apparel sector in 2003 (the latest year for which data are available) earned less than in 2000 and also 1994 (but more than in 1995, as displayed in Fig. 1) – even in nominal terms. Other countries in our sample where wages went down include Bangladesh and Viet Nam – although in these cases, due to a lack of data, the declines refer to time periods of only three and two years, respectively, and therefore cannot be fully compared to the figures for other countries which cover longer time periods. Overall, however, one can observe a slight upward trend in nominal wages in the apparel sector over the last ten to twenty years.

Figure 1: Average annual wages in the apparel sector, selected countries (in US$)



Note: For Lesotho, the figure for 2000 refers to 2001; for Mauritius, the figure for 1995 refers to 1997 while the figure for 2007 refers to 2006; for China, the figure for 2000 refers to 2003; for India, the figures for 1995 and 2007 refer to 1998 and 2005, respectively; for Sri Lanka, the figure for 2007 refers to 2006; and for Viet Nam, the figure for 1995 refers to 1998
Source: Authors' own illustration based on data from UNIDO's INDSTAT4 database (2010 version)

Combining data on employment and wage changes to assess social upgrading or downgrading, we find that clear-cut social upgrading in the apparel sector was rather scarce over the last two decades. There were, in fact, only two unambiguous cases of social upgrading, namely Cambodia and China. However, while China's improvements in terms of employment and real wages have been rather modest (around 60% each over a period of five years), Cambodia's performance has been extraordinary, with a doubling of real wages and an almost 60-fold increase in employment.

[7] In brackets are the latest years for which data are available, respectively.

At the other extreme, all the African countries in our sample recorded a decline in employment. In Lesotho this was accompanied by an increase in real wages (the largest in our sample, reaching an impressive +191% between 2001 and 2007). In Mauritius and South Africa, workers' remuneration went down too so that their apparel sectors experienced clear-cut social downgrading.

Besides Lesotho, there have actually been quite a number of other "intermediate cases", yet with exactly opposite developments on the two indicators (i.e. with employment up and real wages down). These include the two remaining Asian countries in our sample (India and Viet Nam) as well as the only Latin American country in our sample, namely Mexico. The latter has followed a quite peculiar trajectory which featured a tremendous (10-fold) increase in employment at the same time as real wages went down by 79%. Only India's apparel sector has witnessed a more dramatic fall in real wages (of -81%). Meanwhile, Viet Nam was very close to being categorized as a social upgrader, with a wage decline only slightly above zero and employment growth of 42%.

Table 5: Social upgrading in apparel, early 1990s-late 2000s

	Growth (in %) Employment	Growth (in %) Real Wages
Social Upgraders		
Cambodia	5,824.69	84.53
China	54.81	66.70
Social Downgraders		
Mauritius	-29.11	-16.13
South Africa	-37.31	-43.82
Intermediate Cases		
India	52.02	-80.53
Lesotho	-60.56	190.53
Mexico	1,080.62	-78.99
Viet Nam	41.72	-5.22

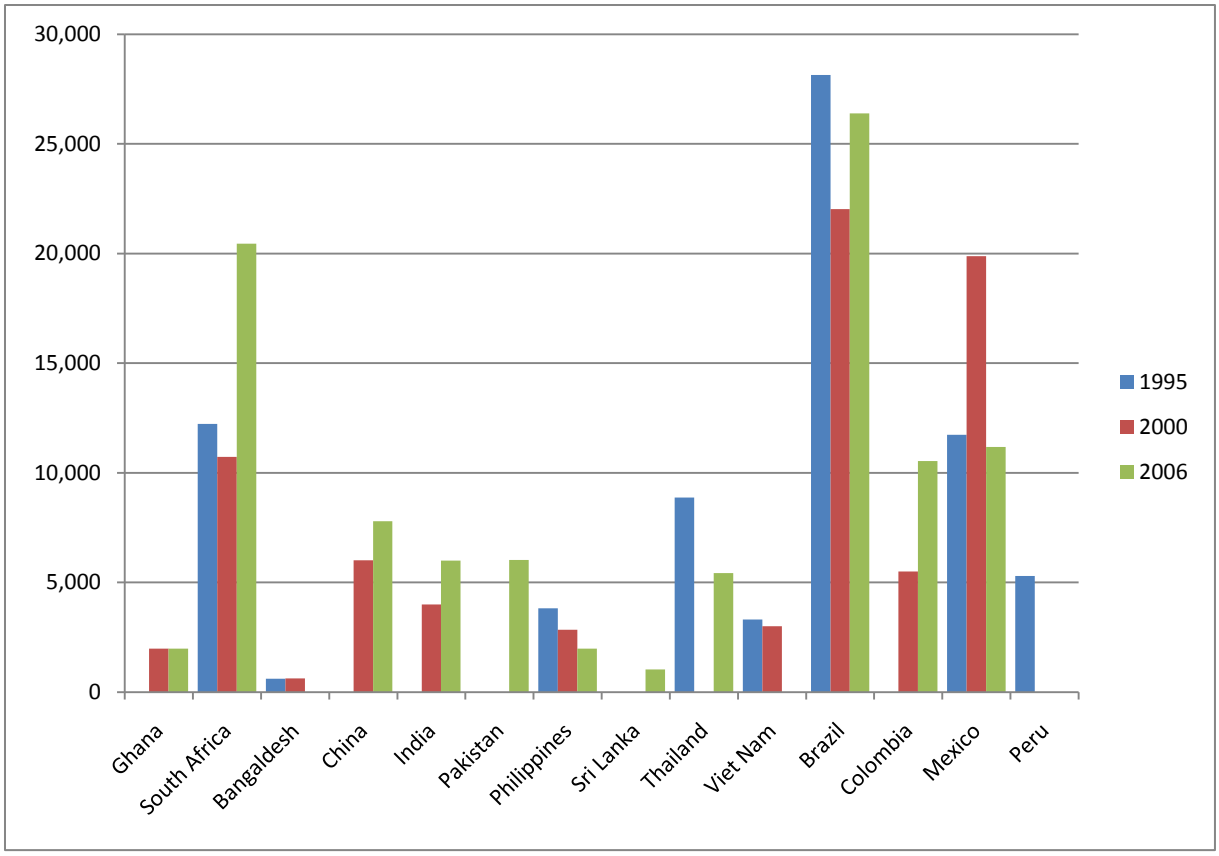
Time spans covered are as follows: Lesotho (2001-2007), Mauritius (1997-2006), South Africa (1993-2007), China (2003-2007), India (1998-2005), Viet Nam (2005-2008), Mexico (1995-2003)
Source: Authors' own calculations based on nominal wage data from UNIDO's INDSTAT4 database, and inflation data from the IMF's International Financial Statistics database

4.2 Mobile telecom

Date on wages and employment in mobile telecom are best for the Asian countries in our sample. China plays an outstanding role with 1.8 million employees in the mobile telecom sector in 2007 (up from 934,000 in 2003) – which also reflects its dominance as an exporter to world markets. Employment is also sizeable in Thailand and India – although the two countries have gone through opposing developments. While in Thailand the number of jobs in the mobile telecom sector grew from 44,000 to 59,000 between 1996 and 2006, in India employment fell from 90,000 in 1998 to 57,000 in 2005. In Latin America, Mexico's mobile telecom sector is by far the largest in terms of employment. In 2003, the latest year for which data are available, it gave work to 83,500 people – an astonishing increase compared to the 6,000 workers it had in 1994 (the earliest year for which data are available). In Brazil, employment figures have been much more stable: The 59,700 jobs that the mobile telecom sector offered in 2007 were only slightly less than the 61,000 jobs it offered in 1996.

The countries with the highest average annual wages are Brazil, South Africa and Mexico (see Fig. 2). However, wages have developed quite differently in these three countries over the last decade or so. In Brazil, average annual wages decreased between the mid-1990s and mid-2000s (from from US$ 28,100 in 1996 to US$ 17,400 in 2004) but increased again afterwards so that in 2007 (US$ 28,400, the latest figure available) they were slightly higher than in 1996. Wages in the South African mobile telecom sector actually went through a similar trajectory although the downward trend in the earlier years was less pronounced (from US$ 11,600 in 1993 slightly down to US$ 8,000 in 2002) whereas the upward trend in the later years was more pronounced (from US$ 8,000 in 2002 to US$ 20,500 in 2006). Meanwhile, Mexico experienced the reverse trends: the average pay went up from US$ 11,500 per year in 1995 to US$ 19,900 in 2000 and then down again to US$ 11,200 in 2003. In Colombia and China, in turn, workers' remuneration have continuously grown since the turn of the millennium so that by the end of the 2000s they had almost reached the Mexican wage level. In 2005, a typical Colombian employee in the mobile telecom sector earned US$ 10,500 per year while his or her Chinese counterpart received only a bit less than US$ 10,000 in 2007. A similar steady upward trend in workers' income (albeit at a lower level) was experienced in the Indian mobile telecom sector where annual average wages rose from US$ 3,400 in 1998 to US$ 6,000 in 2005. In the Philippines, Thailand and Viet Nam, on the other hand, wages developed in the opposite direction. They went down from a high US$ 8,900 a year in 1996 to US$ 5,400 in 2006 in Thailand, from US$ 3,800 per year in 1996 to US$ 2,000 in 2005 in the Philippines, and from US$ 3,300 a year in 1998 to US$ 3,000 in 2000 in Viet Nam. However, the lowest wages (in our sample) are paid in Bangladesh and Ghana where a typical employee in the mobile telecom sector earned a mere US$620 (in 1998) and US$ 1,970 (in 2003) per year, respectively. Note that average wages are still much higher in the mobile telecom sector than in both the horticulture sector and the apparel sector.

Figure 2: Average annual wages in the mobile telecom sector, selected countries (in US$)



Note: For Ghana, the figure for 2006 refers to 2003; for Bangladesh, the figure for 2000 refers to 1998; for China, the figure for 2000 refers to 2003; for India, the figure for 2006 refers to 2005; for the Philippines, the figures for 1995, 2000, and 2006 refer to 1996, 1999, and 2005, respectively; for Thailand, the figure for 1995 refers to 1998; for Brazil, the figure for 1995 refers to 1996; for Colombia, the figure for 2006 refers to 2005; and for Mexico, the figure for 2006 refers to 2003
Source: Authors' own illustration based on data from UNIDO's INDSTAT4 database (2010 version)

Overall, in the mobile telecom sector social upgrading has been rare. This is largely because very few countries have experienced gains in real wages. The only unambiguous success story was China where employment doubled and real wages increased by 50%. On the other hand, a third of all the countries in our sample for which data were available have experienced plain social downgrading. The worst performer was South Africa where employment went down by 58% and real wages by 57%, respectively. The decline in real wages has actually been more dramatic in both Brazil and the Philippines, the two other clear-cut social downgraders, yet they have seen a less drastic reduction in employment (of -19% and -35%, respectively) as compared to South Africa. Most of the countries in the sample, in fact, have to be classified as intermediate cases. Among them, Mexico has again followed a very peculiar trajectory: its mobile telecom sector has combined impressive employment growth with a tremendous decline in real wages of -71%. In India real wages increased (by a decent 68%) whereas Thailand and Viet Nam registered growth in employment but a decrease in real wages.

Table 6: Social upgrading in mobile telecom, early 1990s-late 2000s

	Growth (in %) Employment	Growth (in %) Real Wages
Social Upgraders		
China	97.95	47.38

Social Downgraders		
Brazil	-19.27	-63.85
Philippines	-34.59	-68.50
South Africa	-58.12	-56.67
Intermediate Cases		
Colombia	-88.15	11.72
India	-32.69	67.61
Mexico	2,822.86	-71.45
Thailand	45.44	-49.33
Viet Nam	4.70	-20.52

Note: Time spans covered are as follows: Brazil (1996-2007), China (2003-2007), Colombia (2000-2005), India (1998-2005), Mexico (1994-2003), Philippines (1996-2005), South Africa (1993-2006), Thailand (1996-2006), Viet Nam (1998-2000)
Source: Authors' own calculations based on nominal wage data from UNIDO's INDSTAT4 database, and inflation data from the IMF's International Financial Statistics database

4.3 Horticulture

Data on employment in the horticulture sector are not available in international databases, only on wages, and here only at a very disaggregated level (namely for different *occupational groups* within the horticulture sector). In Bangladesh, one of the few countries for which longer time series evidence on wages are available, *monthly minimum wages* for farm supervisors increased from 800 Bangladeshi taka (= US$ 23) in 1990 to 4,700 Bangladeshi taka (= US$ 100) in 1998. Meanwhile, monthly minimum wages for plantation supervisors rose from 800 Bangladeshi taka to only 2,973 Bangladeshi taka (= US$ 62.6) in 1998. During the same period of time, plantation workers saw their monthly minimum wages increasing from US$ 14.5 in 1990 to US$ 46 in 1998.[8]

For Costa Rica between 2005 and 2008, *monthly wages* of farm supervisors and plantation supervisors rose from 168,573 to 293,466 Costa Rican colónes (i.e. from US$ 353 to US$ 559). In the same time period, monthly wages of plantation workers almost did not change in US dollar term (but stayed at around US$ 200) while monthly wages of field crop farm workers increased quite a bit (from US$ 181 to US$ 255).

Monthly average earnings for plantation and farm supervisors on the one hand and workers on the other hand rather diverged in Mexico. In 1999, a typical farm supervisor earned 2,673 Mexican pesos (= US$ 280) a month while a plantation supervisor, on average, earned 1,864 Mexican pesos (= US$ 195) per month. Farm workers and plantation workers, on the other hand, received average monthly wages of 1,137 Mexican pesos (= US$ 119) and 1,280 Mexican pesos (= US$ 134), respectively. By the late 2000s, this wage gap had widened. In 2008, a plantation supervisor's average monthly earnings were 6,536 Mexican pesos (= US$ 592.5) whereas farm workers and plantation workers' average monthly wages had only increased to 2,780 Mexican pesos (= US$ 252) and 2,641 pesos (= US$ 239), respectively. The latest year, for which income data is available for farm supervisors is 2004; in that year, their average monthly earnings were 4,672 Mexican pesos (= US$ 414).

In terms of real wages, Table 7 shows that actually only two countries, Honduras and Nicaragua, saw a decline. On the other hand, three quarters of the countries in our sample have registered an

[8] All wages reported here are nominal; they were taken from the ILO KILM and LABORSTA databases and converted into US$ using annual average exchange rates as reported in the IMF's International Financial Statistics (IFS) database.

increase in horticulture real wages, some of them even impressively so (most notably Belize and Bangladesh where real wages grew more than tenfold and more than doubled, respectively).

Table 7: Social upgrading in horticulture, 1990s-2000s

	Real Wage %-change
Bangladesh	145.09
Belize	1,295.26
Brazil	26.75
Costa Rica	15.72
El Salvador	25.01
Honduras	-55.33
Mexico	77.17
Nicaragua	-33.81

Note: Time spans covered are as follows: Bangladesh (1990-1998), Belize (1990-1995), Brazil (1999-2001), Costa Rica (2005-2008), El Salvador (2001-2008), Honduras (1990-1997), Mexico (1999-2008), Nicaragua (1993-2002)
Source: Authors' own calculations based on nominal wage data from the ILO's LABORSTA and KILM databases, and inflation data from the IMF's International Financial Statistics database

4.4 Tourism

Employment in the tourism sector increased in all the countries in our sample over the past two decades. In absolute terms, the two Asian giants, China and India, have the highest numbers of employees in the tourism sector. In 2009, the Indian tourism industry provided jobs for 18.4 million people while the Chinese industry employed 16.7 million people. Both figures have grown considerably since 1990 when tourism employment in both countries amounted to about 11.7 million. Brazil and Indonesia rank third and fourth in terms of the number of jobs; both had more than 2 million employees in the tourism industry in 2009. However, they have experienced much slower growth in tourism jobs than China and India.

One of the countries with the most rapid increase in tourism employment has been Uganda (up from 43,700 jobs in 1990 to 182,500 jobs in 2009). This contrasts with the experience of the two other African countries in our sample, Kenya and South Africa, where employment growth has been more moderate (from 151,000 to 197,000 and from 252,000 to 389,000, respectively, between 1990 and 2009).

Similar intra-regional discrepancies can be observed in Latin America and the Caribbean where Brazil and Jamaica (up from 67,900 to 85,800 jobs) have experienced only sluggish job growth in the tourism sector whereas in Costa Rica employment has increased quite dramatically over the last 20 years (from 52,400 to 118,900 jobs). Meanwhile, in Asia, tourism employment growth has been signifcant in Jordan and Nepal (from 53,800 and 141,700 to 130,400 and 274,400 jobs, respectively) but rather slow in Viet Nam (from 951,000 to 1.4 million jobs).

Wage data in the tourism sector are scarce. For the African countries in our sample, for instance, there are no income data available. By comparison, data availability is much better for Asia where we have wage data for four out of the six countries in our sample – which refer to different *occupational groups* within the tourism industry. Interestingly, nominal wages have risen in all these four countries since the early 1990s. In China, for example, between 1990 and 2006 *annual average wages* increased dramatically from 248 Yuan to 24,700 Yuan (i.e. from US$ 52 to US$ 3,200) for cooks, from 165 Yuan to 12,700 Yuan (i.e. from US$ 35 to US$ 1,700) for waiters, from 229 Yuan to 11,400 Yuan

(i.e. from US$ 48 to US$ 1,500) for room attendants and chambermaids, and from 299 Yuan (in 1992) to 14,000 Yuan (i.e. from US$ 54 to US$ 1,800) for hotel receptionists.[9]

For India, data are only available for the 1990s, during which all occupations experienced real wage gains. In Brazil, we have the interesting situation that across all occupations nominal wages increased across in local currency terms but not if converted into US dollars. In Costa Rica, on the other hand, wages in the tourism sector grew quite considerably – both in local currency and US dollar terms. Hotel receptionist, for example, saw their *monthly wages* increase from 26,600 Costa Rican colónes (= US$ 187) in 1993 to 213,600 colónes (= US$ 407) in 2008. Room attendants and chambermaids, in turn, on average earned 73,900 Costa Rican colónes (= US$ 259) in 1999 and, after a steady increase, 154,300 colónes (= US$ 294) in 2008.

Analysing social upgrading in the tourism sector is difficult because of the paucity of wage data. Among those countries for which data are available, three are unequivocal upgraders while two represent intermediate cases so there are no clear-cut downgraders (see Table 8). The stellar performer has been China's tourism sector where workers have seen an exceptional, twenty-fold increase of their real wages; yet employment has grown only by around 20%. Meanwhile, Costa Rica's achievements are also impressive: Employment has more than doubled while real wages have gone up by 82%. In India, the number of tourism jobs has grown faster than in China (+41%) but the rise in real wages (+40%) has fallen short of that in the two other upgraders, China and Costa Rica. The remaining two "intermediate cases" have both seen an increase in tourism employment but a decrease in real wages. In both Brazil and Jordan real wage declines have, in fact, been quite small (-6% and -2%, respectively). With such an insignificant decrease in real wages and an increase in tourism employment of 64%, Jordan has actually come very close to be an upgrader. Brazil's growth in employment, in turn, has been much more modest (+15%).

Table 8: Social upgrading in tourism, early 1990s-late 2000s

	Growth (in %) Employment	Growth (in %) Real Wages
Social Upgraders		
China	18.10	1,962.29
Costa Rica	121.28	81.79
India	41.01	40.21
Social Downgraders		
-		
Intermediate Cases		
Brazil	15.00	-5.79
Jordan	64.40	-1.80

Source: Authors' own calculations based on employment data from the World Travel & Tourism Council's (WTTC) Economic Data Search Tool, wage data from the ILO's LABORSTA and KILM databases, and inflation data from IMF International Financial Statistics database

4.5 Social Upgrading: A Summing Up

[9] The wage data in this section are drawn from the ILO KILM and LABORSTA databases and converted into US$ using exchange rates as reported in the IMF's IFS database. All wages reported here are nominal.

As with economic upgrading, patterns of social upgrading or downgrading vary quite a bit across sectors. Social upgrading has been most difficult in the mobile telecom sector, where employment gains have been widespread but wage gains have occurred in only a few countries. By contrast, social achievements have been more widespread in the tourism sector (with no clear-cut downgrader) and the apparel sector (where only a quarter of the countries in our sample have experienced unambiguous social downgrading). Yet, clear-cut social upgrading has been scarce even in the apparel sector (with solely two cases) while the tourism sector is the only sector where clear-cut upgraders constitute the majority (namely 60% of the countries in our sample).

Overall, the bulk of countries in our sample have experienced ambiguous progress, with improvements on one front but deterioration on the other front, which makes them "intermediate cases" according to our categorization scheme. In this regard, looking at our two indicators of social upgrading separately reveals that, in general, achieving gains in employment has been more common than achieving increases in real wages. As a corollary, employment growth has generally been associated with less-than-proportional growth or even declines in real wages.

Interestingly, looking at the social performance of single countries across sectors shows much more consistent patterns as compared to the economic sphere. China, for example, has experienced clear-cut social upgrading in *all* the sectors where its performances was analyzed (namely apparel, mobile telecom, and tourism). Meanwhile, Mexico and Viet Nam have displayed mixed performances in *all* the sectors where they were included in the sample (being "intermediate cases" in the apparel and mobile telecom sectors) whereas India was classified as "intermediate case" in two of three sectors (i.e. apparel and mobile telecom while in tourism it qualified as upgrader). South Africa, on the other hand, has experienced social downgrading in *both* of the two sectors where its performances was analyzed (i.e. apparel and mobile telecom) – which, by the way, matches its overall poor performance in economic terms. The only slight inconsistency can be observed in the case of Brazil whose mobile telecom sector has experienced clear-cut social downgrading while its tourism sector's social performance has been ambiguous.

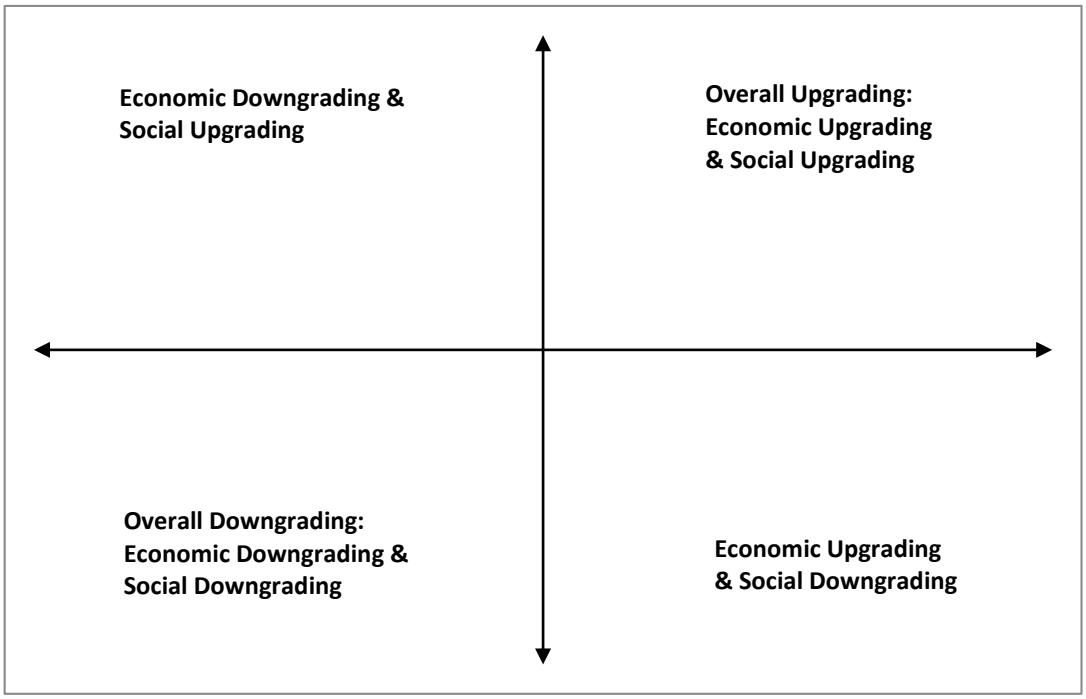
Compared to the economic realm, it seems that upgrading has been more tenuous in the social sphere while downgrading has been more common (although, interestingly, results are reverse in the tourism sector where economic downgrading has been widespread while there has not been a single case of social downgrading). This observation already gives a first hint on the possible relationship (or lack thereof) between economic and social up- and downgrading. Let us therefore now take a look at the two realms combined.

5. The Relation between Economic and Social Upgrading

A central purpose of this paper is to analyze the relationship between economic and social upgrading. We have defined economic upgrading as a combination of changes in export market shares and changes in export unit values. Social upgrading is defined by changes in employment and changes in real wages. Is improved export performance associated with better labor market conditions? To begin to address this question, we use the data presented above to create a single index of economic upgrading and a single index of social upgrading and we plot them together. This allows an analysis of the relation between economic and social upgrading in a 2x2 matrix, a prototype of which is depicted in Fig. 3. Of the four different scenarios, the northeastern and the southwestern quadrants represent the clear-cut cases. The northeastern quadrant includes those

countries that combine economic upgrading and social upgrading for "overall upgrading". In the southwestern quadrant, on the other hand, will be those countries that have experienced both economic and social downgrading and that, therefore, have to be called "overall downgraders". Countries falling in the remaining two quadrants are again intermediate cases, with success on one front (either economic or social) but lack of progress on the other front. Their experiences are, thus, harder to be interpreted as either clear "overall" upgrading or downgrading.[10]

Figure 3: Prototype Matrix of Economic and Social Upgrading



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We propose a simple method for combining the two variables in each realm which gives equal weight to each component. To get an indicator for economic upgrading, for example, a weight of 50% each is assigned to both the percentage change in export market share and the percentage change in export unit value. The underlying formulas for the calculation of upgrading are:

*Economic Upgrading = 0.5 * (% change in market share) + 0.5 * (%-change in export unit value)*

*Social Upgrading = 0.5 * (%-change in employment) + 0.5 * (%-change in real wages)*

After we present the calculations using this method, we introduce two alternative algorithms for calculating upgrading/downgrading and we compare results across methods in order to provide a sense of the robustness of the results with any one of the methods.

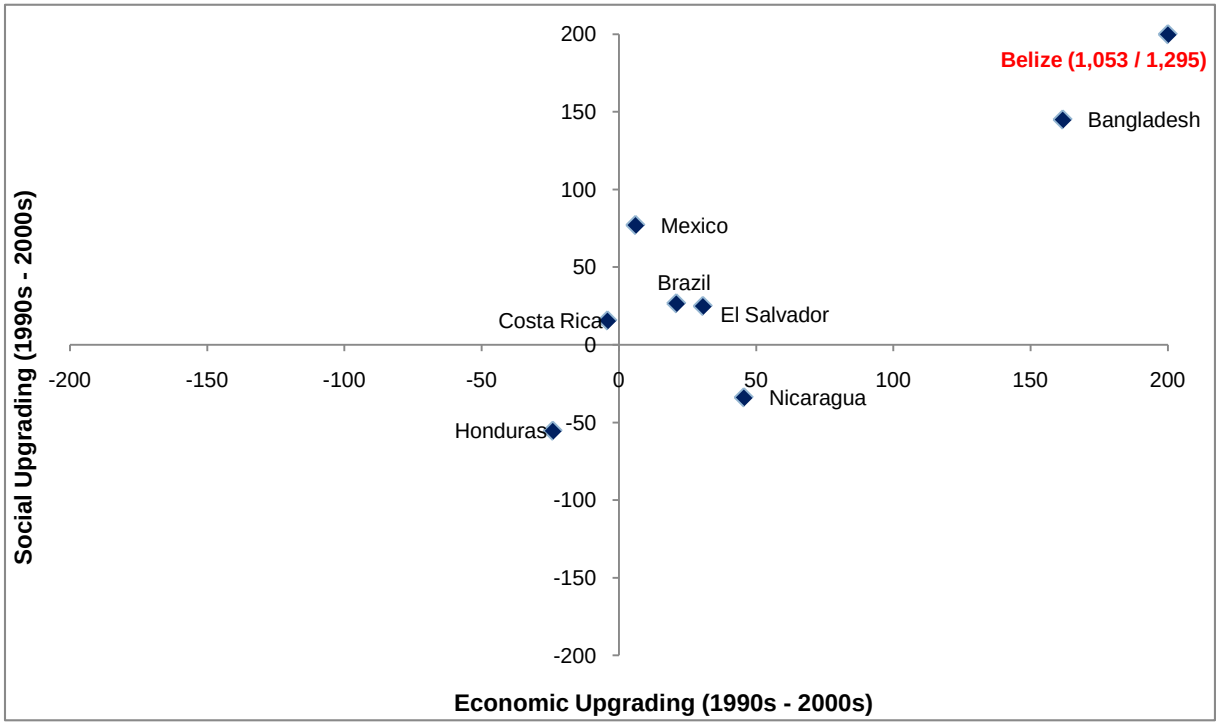
5.1 Overall upgrading calculations

In **horticulture**, the majority of countries in our sample for which data are available (namely five out of eight) show up in the northeastern quadrant, that is having undergone both economic and social

[10]Below we present three methods for measuring upgrading and downgrading, one of which does not allow for "intermediate cases" but instead categorizes every country as upgrader or downgrader in any given sector.

upgrading. The most outstanding performer has been Belize with impressive upgrading on both the economic and the social front. It is interesting to note that Bangladesh has been the second stellar performer with significant improvements in both economic and social terms. Advances have been more modest in the remaining upgraders, namely Brazil, El Salvador, and Mexico, with the latter scoring high on the social front while recording only a very small improvement on the economic front. In the southwestern quadrant, Honduras figures as the only straightforward overall horticultural downgrader in our sample, with regress notably in the social sphere. The two intermediate cases in our sample, Costa Rica and Nicaragua, have had opposing experiences: While Costa Rica improved on the social front but did not manage to do so on the economic front (although only narrowly), Nicaragua has not been able to accompany its economic success with social progress. Overall, however, Fig. 4 gives the impression that there has been a positive correlation between economic upgrading and social upgrading in the horticulture sector.

Figure 4: Economic and social upgrading and downgrading in horticulture, 1990s-2000s

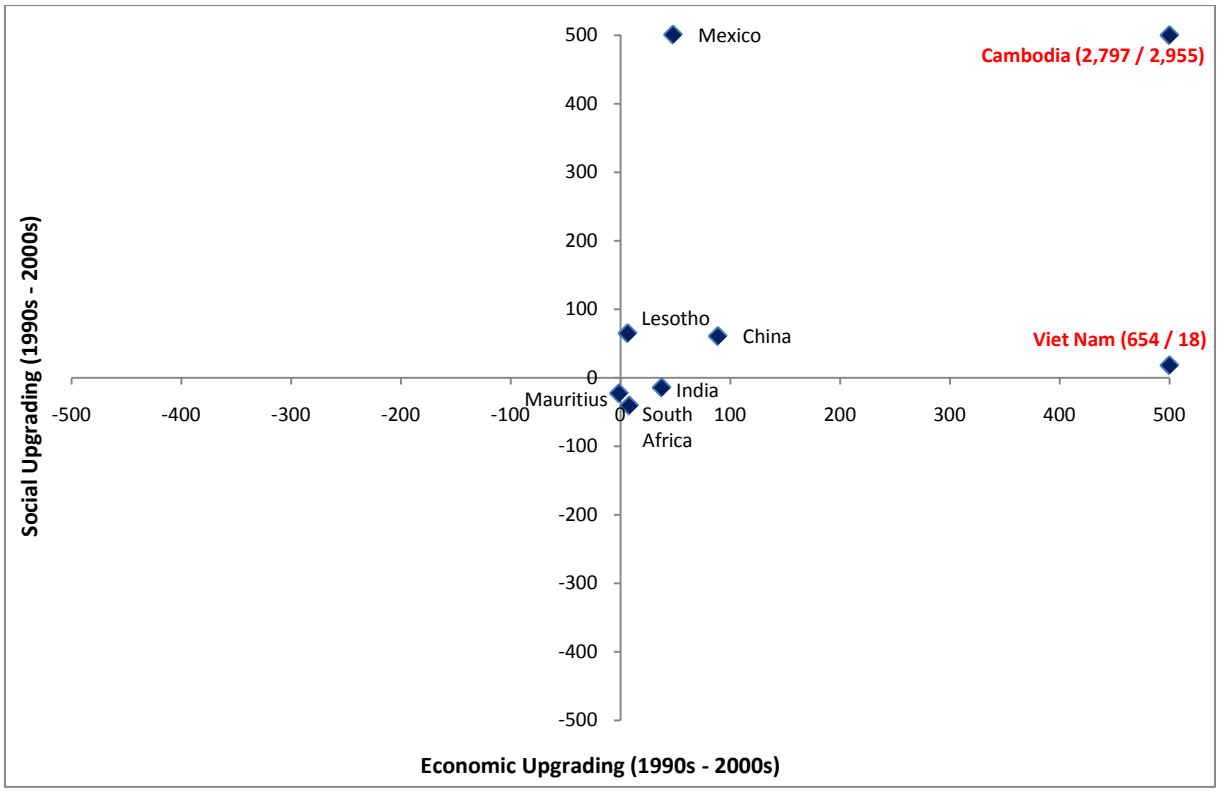


Note: The measure for Social Upgrading includes only changes in real wages
Source: Authors' own illustration; data sources as indicated above

The **apparel** sector has also many cases of overall upgrading. Fig. 5 shows that more than 60% of the countries in our sample for which data are available (i.e. five out of eight countries) appear in the northeastern quadrant of clear overall upgraders. Among them, Cambodia has clearly been the prime performer with formidable upgrading in both economic and social terms. Other outstanding performers include Viet Nam (on the economic front) and Mexico (on the social front). The remaining two upgraders' progress has been less pronounced but still decent, particularly China's (with respectable upgrading on both fronts, actually). Lesotho, in turn, has performed quite well in social terms but has not been able to match this with equal progress in economic terms. There is just a single case of full-fledged overall downgrading in the apparel sector, namely Mauritius. The remaining two countries in our sample, India and South Africa, are categorized as intermediate cases.

Both have experienced upgrading in the economic sphere but downgrading in the social sphere. Overall, when judged by Fig. 5, there seems to have been a positive relationship between economic upgrading and social upgrading in the apparel sector.

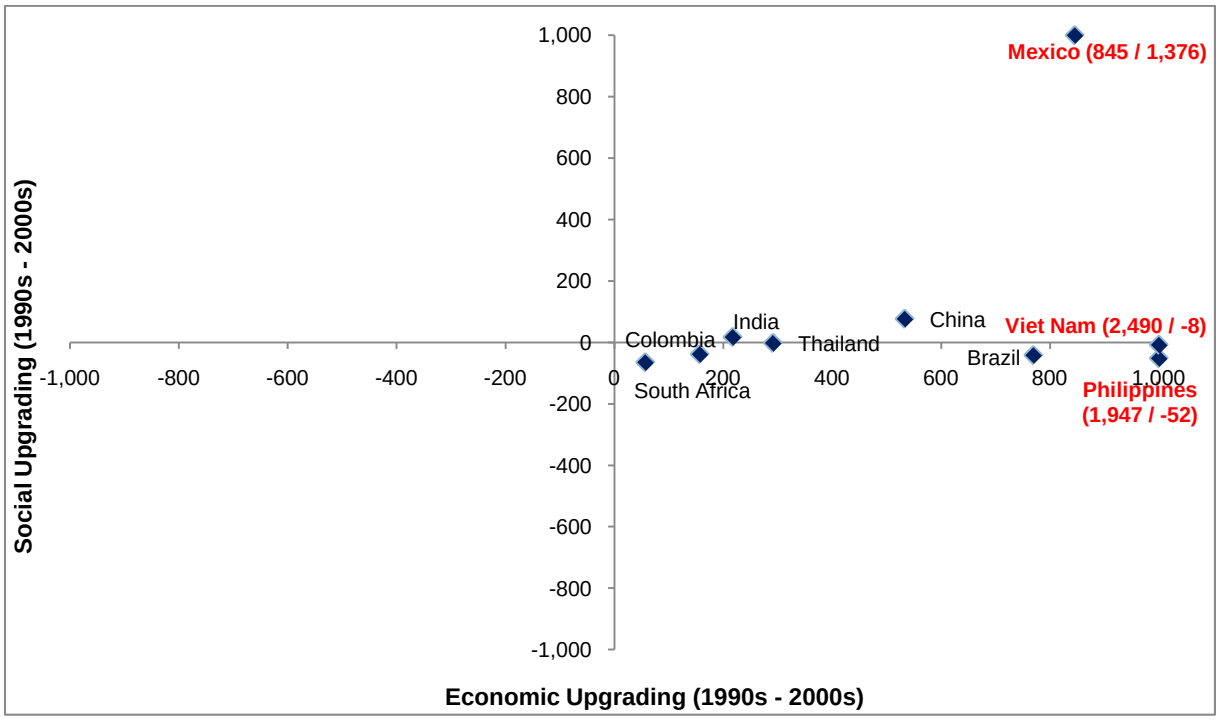
Figure 5: Economic and social upgrading and downgrading in apparel, 1990s-2000s



Source: Authors' own illustration; data sources as indicated above

In the **mobile telecom** sector there has been ubiquitous economic upgrading but very little social upgrading. As can be seen in Fig. 6, all of the countries in our sample are located to the right of the vertical axis, implying that there has not been a single case of economic downgrading. The best overall performer has clearly been Mexico with spectacular upgrading on both the economic and the social fronts. Mexico's social performance is particularly noteworthy, especially when compared to the sluggish or, even more often, entirely absent social progress in the other countries. In fact, the two Asian giants, China and India, are the only other countries that qualify as overall upgraders in the mobile telecom sector. Both have combined an excellent economic performance with weak social upgrading. All the remaining countries in our sample (i.e. almost 70%) are classified as intermediate cases – invariably because of a lack of social upgrading. These include some very strong economic performers, however, most notably the Philippines, Viet Nam, and Brazil. In fact, Viet Nam's – as well as Thailand's – social performance indicator falls only narrowly in the negative range so that these two Southeast Asian countries have actually come very close to be overall upgraders. The two South American countries in our sample, Brazil and Colombia, in turn, have experienced quite decent total economic upgrading but also quite pronounced total social downgrading. By far the worst performer has been the only African country in our sample, i.e. South Africa. Recording the smallest improvements in economic terms and the largest deteriorations in social terms, South Africa actually performed worst on *both* fronts.

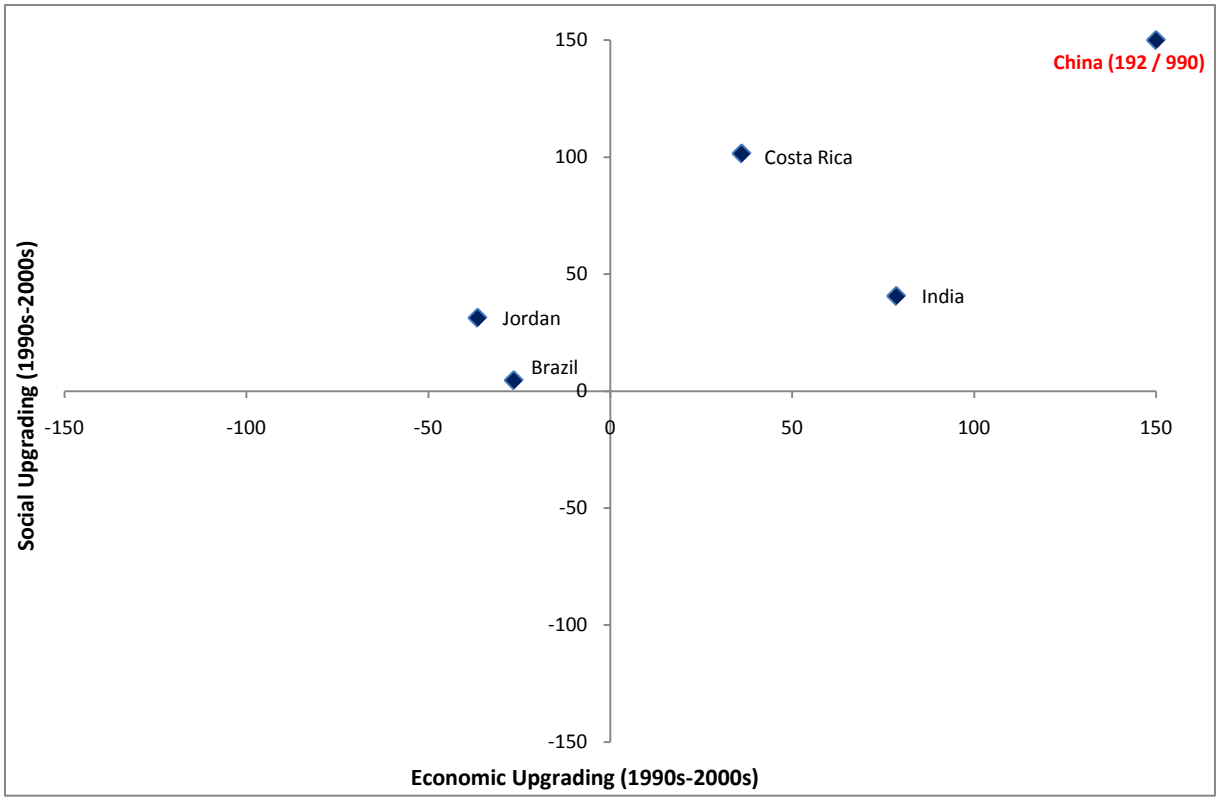
Figure 6: Economic and social upgrading and downgrading in mobile telecom, 1990s-2000s



Source: Authors' own illustration; data sources as indicated above

In the **tourism** sector, developments have been kind of inverse to those seen in the mobile telecom sector: While there has been widespread social upgrading (experienced by *all* of the countries in our sample for which data were available) there has been somewhat less economic upgrading. In Fig. 7, all the countries are situated above the horizontal axis, signaling that they have registered social upgrading. Among them, three (namely China, Costa Rica and India) have also experienced economic upgrading so that we observe three instances of overall upgrading in the tourism sector. China has been the premier performer with remarkable economic upgrading but even more impressive social upgrading. In Costa Rica, the pattern (economic upgrading combined with even more social upgrading) has been the same, albeit at a smaller scale. In fact, this pattern – with the social performance trumping the economic performance – can also be observed for the two intermediate cases, Brazil and Jordan. These two countries have recorded social upgrading but economic downgrading. The only exception to the pattern described above is India, the third overall upgrader, which is the only country in our sample whose economic performance in tourism has been better than its social performance. There is thus no plain overall downgrader in the tourism sector, as indicated by the empty southwestern quadrant in Fig. 7.

Figure 7: Economic and social upgrading and downgrading in tourism, 1990s-2000s



Source: Authors' own illustration; data sources as indicated above

5.2 Robustness tests

One problem with our method of calculating economic or social upgading is that outcomes have a lower bound of -100% but an upper bound of infinity. To be sure, none of the indicators can fall below zero – which would correspond to a decrease of -100% from the initial level. On the other hand, countries can – and did so, as we saw in the last two sections – register increases on any of the indicators that go far beyond +100%, especially with very low initial values. This introduces a certain pro-upgrading bias in our method. To assess the robustness of the findings based on this method, we introduce two alternative algorithms for determining upgrading/downgrading. Here we summarize the three measures (beginning with method 1 adopted above), and then discuss how the findings change when the other methods are used.

Method 1: Symmetric "composite index"

In the first method (used in the previous section) all four underlying indicators enter symmetrically, that is they are given equal weight. This method gives unambiguous results in those cases where both underlying indicators within one sphere (i.e. economic or social) have the same sign: If both indicators are positive, or if both are negative, so will be the composite index, respectively. For ambiguous cases, the sign of the "composite index" depends on the absolute values of the two underlying indicators. If the absolute value in the increase of one indicator is higher than the absolute value in the decrease of the other indicator, the composite index will have a positive sign. It can be argued that this is a reasonable result as it makes sense to characterize a country's sector as having experienced economic or social upgrading as long as the positive development in one indicator *outweighs* the negative development in the other indicator.

Method 2: Asymmetric "composite index"

The second metric addresses the problem of the existence of a lower bound (-100%) in the absence of an upper bound. The underlying formulas for method 2 are:

*Economic Upgrading" = [(1+% change in market share) * (1+% change in unit value)] - 1*

*Social Upgrading" = [(1+% change in employment) * (1+% change in real wage)] - 1*

As with method 1, this second metric also delivers unequivocal results in those cases where both underlying indicators within one area (i.e. economic or social) have the same sign. For the intermediate cases, in turn, it is important to note that the bias towards upgrading does not vanish altogether (because there is still a lower bound for each of the four underlying indicators while there is still no upper bound). Yet, this second metric "punishes" a decrease in one of the two indicators (within one sphere) in the following sense: the more one of the indicators declines, the more the other indicator has to increase to yield *upgrading* as a result. In other words, pronounced decreases on one front have to be "compensated" by an even higher increase on the other front for total upgrading to be the result. On the other hand, this method "rewards" countries that perform well on both fronts. For example, if a country has experienced high increases on both of the two indicators for upgrading within one sphere (i.e. economic or social), this metric will – due to its multiplicative form – yield a value of total upgrading that is higher than the symmetric "composite index" of method 1.

Method 3: Narrow definition

Compared to the first method, the second method is stricter in the sense that it will categorize fewer countries as upgraders. This is so because, as we have seen, a country-sector that experiences a decline in one of the two indicators in either the economic or the social sphere has to record a bigger increase in the other indicator to still give a result of economic or social upgrading. Yet it is still possible with the second metric (as it is with the first metric) for a country to qualify as economic or social upgrader even if one of the indicators has a negative sign. This might be disputed on the basis of a very narrow interpretation of our definitions of economic and social upgrading presented in Section 2 above. A very strict reading of these definitions would imply that a country can be said to have experienced economic or social upgrading in a sector *if and only if both* indicators have positive signs. This is the method adopted by Kaplinsky and Readman (2005). Using this method there are no intermediate cases. Any country that experiences a decline in any of the indicators automatically disqualifies as an upgrader and is instead rated as a downgrader. In other words, method 3 only ranks those countries as *overall* upgraders where *all* four indicators have a non-negative sign.

We turn now to a brief analysis of the robustness of the results presented in the previous section in light of the two other calculation methods proposed. In the **horticulture** sector, overall upgrading was found to be widespread with method 1 and this finding is robust to the other two methods.[11] In fact, the only difference between method 1 and method 2 is that the latter classifies Mexico as intermediate case (and not an overall upgrader). The reason for this is that Mexico's gains in export

[11] Note that as we do not have employment data for the horticulture sector, we simply use wage data (i.e. the %-change in real wages) as proxy for social upgrading.

market share (+43%) have not been sufficient to outweigh its decrease in export unit values (-31%) when using the second metric to calculate economic upgrading. By contrast, application of method 3 yields dramatically different outcomes. According to this approach, only Bangladesh qualifies as real overall upgrader in the horticulture sector while all the other countries have to be called downgraders (see Table 9 below). Belize's outstanding performance in this sectors is also confirmed if we use method 2, but Belize does not qualify as overall upgrader if we apply method 3 because of a decline in its export unit values. This was swamped by a much higher increase (in absolute terms) in its export market share which allowed it to qualify as upgrader according to both methods 1 and 2. This reveals that all of the countries in our sample, with the exception of Bangladesh, have registered a decrease in at least one of their indicators.

Meanwhile, the **apparel** sector has also witnessed quite a lot of overall upgrading as judged according to method 1, and this finding is again supported with method 2. The number of overall upgraders is the same in both cases. However, the number of overall downgraders increases by one as South Africa is a plain downgrader according to method 2, not an intermediate case as under method 1. This difference in the assessment of South Africa's performance is rooted in the fact that the growth of its export unit values (+83%) has not been enough to outweigh its loss of export market share (-67%), making South Africa an economic downgrader according to the arithmetic of method 2. Given that South Africa has also experienced total social downgrading, classifying it as economic downgrader reinforces the overall impression of a positive correlation between economic upgrading and social upgrading in the apparel sector.

While methods 1 and 2 yield exactly the same categorization of countries (except for, as noted, South Africa), method 3 leads to a significantly different diagnosis. In fact, according to method 3, only Cambodia and China qualify as full-fledged overall upgraders in the apparel sector. By contrast, the remaining six countries in our sample are classified as overall downgraders, disclosing that they have not managed to progress on *all four* indicators (see Table 9).

The **mobile telecom** sector has experienced widespread economic upgrading but very little social upgrading. This is corroborated by applying method 2. Actually, methods 1 and 2 lead to exactly the same classification of countries with only minor differences in the numerical values of the composite economic and social indicators but no differences in their signs. By contrast, method 3 yields a distinct assessment and identifies only China as a full-fledged overall upgrader in the mobile telecom sector. The remaining eight countries in our sample, in turn, are all classified as overall downgraders. Even Mexico, the outstanding performer according to methods 1 and 2, does not qualify as overall upgrader when evaluated through the strict lenses of method 3. The reason is that one of its social performance indicators (namely the change in real wages) has a negative sign – a feature that it shares with all the other countries in our sample (with the exception China, as noted). As a result, overall upgrading has been very scarce when judged by method 3, with China – the only country that has succeeded to register improvements on *all four* indicators – as solitary upgrader (see Table 9).

In the **tourism** sector, developments were broadly the opposite of those in the mobile telecom sector with widespread social upgrading and less economic upgrading. This is also true for method 2 which, by the way, leads to an identical categorization of countries in terms of their overall up/downgrading performance. Again, differences between the results of methods 1 and 2 are minor and only pertain to the numerical values of the composite indexes. In terms of the larger picture, however, both methods lead to the same conclusion, namely that the tourism sector has

experienced quite some social upgrading with less economic upgrading. As with the other sectors, application of method 3 yields a somewhat different result. Of course, all the intermediate cases of methods 1 and 2 are classified as plain downgraders by method 3. China, Costa Rica and India, however, are recognized as full-fledged overall upgraders also by method 3. This means that, with a share of overall upgraders in the entire sample of 60%, the tourism sector has been the sector with the highest number of overall success stories when judged according to method 3 (see Table 9).

Visual inspection of the scatter plots for the four sectors (which were based on calculations using method 1) revealed a variety of patterns across sectors in the relation between economic and social upgrading. In the apparel and horticulture sectors, there seems to have been a positive correlation between economic upgrading and social upgrading. The mobile telecom sector, in turn, seems to have experienced economic upgrading without much social upgrading. Finally, the tourism sector seems to have seen quite some social upgrading with less economic upgrading. These findings were confirmed by using method 2 which led to almost identical outcomes as method 1.[12] Application of method 3, on the other hand, yields outcomes in terms of classification that are substantially different from those of methods 1 and 2. Table 9 gives an overview of how the different countries in our sample fared in the four sectors in terms of both economic and social up/downgrading according to the three methods of assessment. This helps us in our attempt to draw conclusions about a possible relationship (or lack thereof) between a sector's economic performance and its social performance.

Table 9: Upgraders and Downgraders according to the different approaches (1990s-2000s)

HORTICULTURE							APPAREL						
Countries	Method 1		Method 2		Method 3		*Countries*	Method 1		Method 2		Method 3	
	EU	SU	EU	SU	EU	SU		EU	SU	EU	SU	EU	SU
Bangladesh	+	+	+	+	+	+	Cambodia	+	+	+	+	+	+
Belize	+	+	+	+	-	+	China	+	+	+	+	+	+
Brazil	+	+	+	+	-	+	India	+	-	+	-	+	-
Costa Rica	-	+	-	+	-	+	Lesotho	+	+	+	+	-	-
El Salvador	+	+	+	+	-	+	Mauritius	+	-	-	-	-	-
Honduras	-	-	-	-	-	-	Mexico	+	+	+	+	+	-
Mexico	+	+	-	+	-	+	South Africa	+	-	-	-	-	-
Nicaragua	+	-	+	-	-	-	Viet Nam	+	+	+	+	+	-

MOBILE TELECOM							TOURISM						
Countries	Method 1		Method 2		Method 3		*Countries*	Method 1		Method 2		Method 3	
	EU	SU	EU	SU	EU	SU		EU	SU	EU	SU	EU	SU
Brazil	+	-	+	-	+	-	Brazil	-	+	-	+	-	-
China	+	+	+	+	+	+	China	+	+	+	+	+	+
Colombia	+	-	+	-	+	-	Costa Rica	+	+	+	+	+	+
India	+	+	+	+	+	-	India	+	+	+	+	+	+
Mexico	+	+	+	+	+	-	Jordan	-	+	-	+	-	-
Philippines	+	-	+	-	+	-							
South Africa	+	-	+	-	-	-							
Thailand	+	-	+	-	-	-							
Viet Nam	+	-	+	-	+	-							

Note: EU denotes Economic Up-/Downgrading and SU denotes Social Up-/Downgrading. A "+" indicates (economic or social) upgrading according to the respective method while a "–" indicates downgrading

[12] For details, see Bernhardt and Milberg (2011) appendix tables and figures.

6.3 Connecting economic and social upgrading

While we have framed our analysis in terms of upgrading in global value chains, our analysis has implications also for economic theory relating productivity growth (economic upgrading) and wages (social upgrading). Referring to the marginal productivity theory of wages (or returns to factors of production more generally), economists often claim that higher productivity also leads to higher compensation or remuneration.[13] In the context of our analysis, this view would translate into saying that economic upgrading should lead to social upgrading.

Our framework does not allow for a direct test of this relation, however the results cast doubt on the theory. A first indication of this discordance is provided by the scatter plots presented above, most notably by Figures 6 and 7 for the mobile telecom and tourism sectors, where no clear pattern emerges. A second piece of evidence can be drawn from Table 9: If the claim that economic upgrading is accompanied by social upgrading were true, then the signs that enter the EU and SU columns for a given country and a given sector should be identical. However, the number of countries for which the signs for economic up/downgrading (EU) and social up/downgrading (SU) are the same is rather low according to all three methods: Across countries and sectors, we have a total of 30 data points or data pairs for economic up/downgrading and social up/downgrading; according to method 1, only 16 of these 30 data pairs have the same sign for economic up/downgrading and social up/downgrading while the sign of social up/downgrading corresponds to the sign of economic up/downgrading in just 17 and 15 out of 30 cases when we use methods 2 and 3, respectively.[14] Overall, this does not make a compelling case for the proposition that social upgrading goes hand in hand with economic upgrading.

We should emphasize that all that these exercises can at best indicate is a *correlation* between developments in the economic and social spheres. They tell us nothing about the *direction of causality* between the two. Causality may plausibly run in either direction, and there is empirical evidence on both sides. Flanagan (2005) finds a tight correlation between productivity growth and wage growth in the apparel sector in a large sample of developing countries over 1995-2000. On the other side, Brown (2010) finds that Cambodian apparel firms that complied with labor standards under the ILO "Better Work" program also saw improved performance in terms ofproductivity and exports. Kucera and Sarna (2004) study inward FDI and find it unaffected by higher labor standards.

7. Conclusion

[13] For a textbook presentation of this idea, see Mas-Colell/Whinston/Green (1995) or Varian (1992). For recent empirical tests for developing countries, see Flanagan (2005) and Van Biesebrock (2011).

[14] Among the 16 cases where the signs of total economic up/downgrading and social up/downgrading correspond according to method 1, 15 are overall upgraders while we have only one case of overall downgrading. Among the 17 cases with consonant signs according to method 2, in turn, 14 are overall upgraders and three are overall downgraders. Finally, among the 15 cases where the signs of total economic up/downgrading and social up/downgrading coincide according to method 3, only six are overall upgraders while nine are overall downgraders. These figures highlight a fact already emphasized above, namely that method 1 is indeed the least rigorous in terms of classifying countries as overall upgraders while method 3 is the strictest.

Our analysis of economic and social upgrading provided a parsimonious and operational definition of these terms and applied it to the analysis of horticulture, apparel, tourism and mobile telephones in about twelve developing countries over the period 1990-2009. Our main findings can be summarized as follows:

Regarding economic upgrading we find that in all sectors except for apparel, positive growth in world export market share is generally associated with economic upgrading. However, export market share growth was generally associated with less-than-proportional growth or declines in export unit values. Regarding social upgrading, the general pattern was of employment growth and considerably less growth of real wages.

Contrary to the spirit of much case study of global value chains, our analysis using published data and an admittedly parsimonious definition of uprgrading shows that economic downgrading and social downgrading are both fairly regular occurences, with social downgrading more common in particular because of stagnant real wages.

Contrary to standard economic theory on the relation between productivity growth and wage growth, we found that there is a variety of patterns across GVCs in the relation between economic and social upgrading: In apparel and horticulture we generally find a positive correlation between economic upgrading and social upgrading. In mobile phones there is widespread economic upgrading without social upgrading. And in tourism we found many cases of social upgrading with less economic upgrading. Overall, economic and social upgrading occured together in 15-17 out of 30 cases, depending on the measurement technique adopted. These results were found to be generally robust across a few alternative techniques for measuring upgrading and downgrading.

The findings presented suffer from a number of important limitations. For one, our effort to give some precision to the measurement of economic and social upgrading suffered from considerable problems of data availability. Second, the present study must be taken only as part of a broader research effort that also involves considerable fieldwork in each of the four sectors. Our aim was to provide insights into the dynamics of global value chains that are complementary to this fieldwork. In a sense, our task is to provide the broader context for case studies and fieldwork in the different sectors by sketching a picture of the broader macro-level or at least sectoral picture. This contextualization is crucial in grasping the strengths and limits of the work presented here in terms of contributing to the understanding of economic and social upgrading dynamics and their connection in global value chains.

Future research on economic and social upgrading in global value chains will assess the robustness of the current findings by considering different weighting schemes for the different components of economic and social and also analyze different time periods (including subperiods of the time period studied here). More important will be to advance our understanding of the direction of causality between economic and social change. Finally, it is important that our analysis, relying strictly on internationally comparable published data, be brought into close comparison with the data generated by fieldwork. The goal of such combined research is to answer the central research question of the Capturing the Gains project: what are the conditions under which economic and social upgrading are positively correlated?

Appendix 1: Country samples for the four sectors

Horticulture	Apparel	Telecom	Tourism
Africa: Ethiopia, Kenya, Tanzania, Uganda Asia: Bangladesh, Thailand, Viet Nam Latin America & the Caribbean: Brazil, Chile, Colombia, Ecuador, all Central America	Africa: Kenya, Lesotho, Mauritius, South Africa Asia: Bangladesh, Cambodia, China, India, Sri Lanka, Viet Nam Latin America & the Caribbean: Dominican Rep., El Salvador, Guatemala, Haiti, Mexico, Nicaragua	Africa: Congo (Dem. Rep.), Ethiopia, Ghana, Kenya, Mozambique, Nigeria, Rwanda, South Africa, Tanzania, Uganda Asia: Bangladesh, China, India, Pakistan, Philippines, Sri Lanka, Thailand, Viet Nam Latin America & the Caribbean: Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Paraguay, Peru	Africa: Kenya, South Africa, Uganda Asia: China, India, Indonesia, Jordan, Nepal, Viet Nam Latin America & the Caribbean: Brazil, Costa Rica, Jamaica

Appendix 2: Sector and product definitions

Indicator	Horticulture	Apparel	Mobile telecom	Tourism
Export value & market share	**Sum of HS 06 + HS 07 + HS 08** (HS 06: "*Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage*"; HS 07: "*Edible vegetables and certain roots and tubers*"; HS 08: "*Edible fruit and nuts; peel of citrus fruit or melons*")	**Sum of HS 61 + HS 62** (HS 61: "*Articles of apparel and clothing accessories, knitted or crocheted*", HS 62: "*Articles of apparel and clothing accessories, not knitted or crocheted"*)	**Sum of HS 851712 + HS 851761 + HS 851770 + HS 8523** (HS 851712: *"Telephones for cellular networks or for other wireless networks"*; HS 851761: *„Base stations"*; HS 851770: *„Parts"*; HS 8523: *"Discs, tapes, solid-state non-volatile storage devices, "smart cards" and other media for the recording of sound or of other phenomena"*)	**"Travel expenditures excluding transport"** (from the Balance of Payments, as reported by UNCTAD)
Export unit value	**Weighted average of unit values of HS 0603+0709+ 0710+0803+0805+0806+ 0807+0808+0809+0810** (HS 0603: Cut flowers, dried flowers for bouquets, etc.; 0709: Vegetables nes, fresh or chilled; 0710: Vegetables (uncooked, steamed,	**Weighted average of each country's top-10 export products at the 4-digit level**	**Due to data limitations: Unit value of HS 8523 exports**	**"Travel expenditures excluding transport" divided by "Number of visitors"** **or** **"Travel expenditures excluding transport" divided by ("Number of visitors" x "Average length of stay in days")**

	boiled) frozen; 0803: Bananas, including plantains, fresh or dried; 0805: Citrus fruit, fresh or dried; 0806: Grapes, fresh/dried; 0807: Melons, watermelons and papaws/papayas, fresh; 0808: Apples, pears and quinces, fresh; 0809: Stone fruit, fresh (apricot, cherry, plum, peach, etc.); 0810: Fruits nes, fresh)			(as reported by UNCTAD) (Leading to unit value indicator: Travel expenditures per visitor or Travel expenditures per day of stay)
Employment	**-**	**ISIC code 1810:** "Manufacture of wearing apparel, except fur apparel"	**Sum of ISIC codes 3220 + 3230** (ISIC 3220: "TV/radio transmitters; line comm. apparatus"; ISIC 3230: "TV and radio receivers and associated goods")	**"Travel & Tourism Direct Industry Employment"** (as reported by WTTC)
Remuneration / Wages	**Occupational groups as proxies:** - Farm supervisor - Field crop farm worker - Plantation supervisor - Plantation worker	**ISIC code 1810:** "Manufacture of wearing apparel, except fur apparel"	**Sum of ISIC codes 3220 + 3230** (ISIC 3220: "TV/radio transmitters; line comm. apparatus"; ISIC 3230: "TV and radio receivers and associated goods")	**Occupational groups as proxies:** - Hotel receptionist - Room attendant or chambermaid - Cook - Waiter

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