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Evidence on Productivity and Employment**

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Deindustrialization and the Social and Economic Sustainability Nexus in Developing Countries: Cross-Country Evidence on Productivity and Employment^o

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Abstract

In an empirical investigation of the interactions between industrial structure and macro outcomes, an accounting framework was applied to relate changes in sectoral employment and output compositions to changes in overall productivity growth over time. The numerical results were interpreted using a taxonomy describing industrialization and deindustrialization in developing countries. The findings suggest that, in particular, industrial performance correlates with the overall performance of an economy, and therefore is the key sector in explaining the sustainability of different regional patterns in overall productivity and employment growth. That is, negative rates of productivity growth in the industrial sector are strongly associated with negative productivity growth for the economy as a whole, and vice versa. Further, slow industrial growth may lead to low road development, in which productivity growth trades off with employment growth, while high road development is defined as simultaneously expanding employment and overall productivity growth.

1. Introduction

For many developing countries the macroeconomic stabilization and adjustment experience of the eighties and nineties has been characterized by stagnating productivity and per capita income growth and low capacity utilization (particularly of labor) accompanied by increasing overall inequality. With the research focus on short-run macroeconomics, however, the problem is that with a few exceptions, little attention has been given to the dynamic adjustments of the economic structure of productivity, output and employment that took place in response to the external shocks of the debt crisis followed by macro stabilization and market-oriented structural reform policies since the early to mid-1980s.

Moreover, and as a corollary, the prospect for medium to long-term economic growth as well as social sustainability depends significantly on these induced changes in the industrial structure of an economy. Sustainability for the macroeconomy is narrowly defined as the interplay between overall labor productivity growth and employment expansion which is mediated by output (or demand) growth.

In this investigation of the interactions between macroeconomy and economic structure, particular attention will be given to the industrial sector. Here economic structure is defined as the sectoral composition of output, employment and labor productivity and its evolution over time. The question that will be addressed is whether the global slowdown in labor productivity growth rates outside of South and East Asia is associated with distinctive patterns of changes in the economic structure and particularly in the industrial sectors of developing countries. The cross-country evidence presented in this paper shows a close relationship between the structural dynamics of employment and productivity of the industrial sector and labor productivity growth in the economy as a whole. There is no similar significant association for any of the other sectors under investigation.

Industry, or manufacturing, has long been recognized for its role as “leading sector” or “engine of growth” in the development process (Kaldor, 1966). Since the early 1980s, however, there has been an appreciable slowdown of industrial development in many developing countries particularly in Latin America and sub-Saharan Africa. Over the past decade and a half many African countries have suffered sustained deindustrialization of manufacturing capacity and as a consequence African economies remain the least industrialized in the world (Lall and Stewart, 1996). Lall (1992) for example writes: “Inefficiencies and external shocks exacerbated by poor policies, have led many industries to becoming a drag on their economies rather than engines of growth and structural transformation.”

Similarly in Latin America, reduced economic growth has, not surprisingly, been accompanied by rampant under-utilization of industrial capacity and deindustrialization (Hughes and Singh, 1991; Singh, 1995). This, on the other hand, stands in stark contrast to the recent experience of successful industrialization and rapid productivity and output growth rates of many Asian economies whose overall performance was comparably strong through 1996 despite the recent financial crisis in the region.

These very brief illustrations, of course, are not unfamiliar. What this paper focuses on, however, is a systematic examination of the structural dynamics of industry interacting with a changing overall economy of output, employment and productivity. More generally, the empirical investigations attempt to trace the dynamic adjustments of the sectoral relatives—in particular of industry—in relation to overall changing employment and productivity in the economy. The process of development or industrialization is essentially just this—a dynamically changing structure of the economy according to some (more or less understood) stylized pattern of structural change, while, at the same time, total output is growing (Kuznets, 1966, 1971; Chenery et al., 1986). The manufacturing sector drives this process because industrial activity carries the

potential for efficiency gains from learning-by-doing and increasing returns to scale due to specialization and mechanization. Thus, with higher than average productivity growth rates, the industrial sector contributes dynamically to total output and productivity growth and this process can be conceptualized as a circular process of cumulative causation or virtuous circle of sustainable development (Young, 1928; Myrdal, 1957; Kaldor, 1966, 1978).

In the empirical investigation of the recent deindustrialization phenomenon and its relation to sustainable development of employment and productivity growth, the methodological approach that is taken here is the development and application of an accounting framework.¹ This accounting framework decomposes the (positive or negative) changes in productivity into sectoral shifts of output (or demand) and changes in the employment structure over the last 25 years as developing countries have gone through dramatic adjustment processes. This way we can isolate a sector's contribution—and in particular that of the industrial sector—to total productivity growth.

Further, we will dissect sectoral productivity into changes in output on the one side and changes in employment on the other which will allow us to develop a taxonomy for distinct patterns of deindustrialization. Essentially, a process of deindustrialization can take different forms. Most commonly, it refers to output and employment losses of the industrial sector relative to the rest of the economy. Here, however, we will emphasize a relative loss—with respect to the rest of the economy—of the industrial sector's contribution to overall labor productivity growth.

The research project was organized in two main parts: (i) the compilation and computation of a data set of sectoral employment, real value added and labor productivity at the 1-digit level of the International Standard Industry Classification (ISIC) code for a consistent cross-country comparison; and (ii) the development of a

decomposition framework to provide a profile of about thirty developing countries' productivity performance between the mid-1970s and early 1990s.²

On the basis of findings from the cross-country data series, a brief overview of recent trends in macroeconomic sustainability and regional developments is given in section 2. These discussions serve as background for investigating the relationship between industrial structure and overall productivity and employment growth. Section 3 discusses the role of leading versus lagging sectors in the development process on the basis of a "decomposition exercise" of overall productivity growth. This is followed by an attempt to offer a definition of the concept of deindustrialization in the developing country context through the development and application of a taxonomy, which will then be applied to the empirical results from the decomposition exercise. Finally, the findings are placed in the context of the current policy debate on economic and social sustainability in sections 5.

2. Recent economic history and sustainability

The recent experience of most developing countries, particularly those of sub-Saharan Africa and Latin America, is best understood as a set of structural problems that began to emerge in the 1970s. Following the Golden Age the past two and a half decades are characterized by global stagnation in the North and in many countries of the South outside of East and Southeast Asia. Global stagnation is defined as low capacity utilization, particularly low levels of employment and low per capita income and productivity growth. This crisis of productivity, macroeconomic stability and debt induced a process of international and national restructuring of both production and policy regimes which is still under way.

More specifically, there has been a drastic shift in policy emphasis in the developing world since the debt crisis in the early 1980s which is associated with

dramatic changes in economic performance and significant regional patterns in the growth rates of average labor productivity, output and employment (described in detail below). In response to the crisis, many developing countries engaged in economic reforms that consisted of a mix of stabilization and liberalization policies in particular with respect to their trade and capital accounts. Most importantly, there has been a stepping up of structural adjustment programs in non-Asian economies starting in the mid-1980s.³

First, a brief overview of the sustainability of recent macro trends in productivity, output and employment is provided followed by a discussion of differences in regional performances.

(a) Overview of recent macro trends

In order to capture trends over time, the country data series of sectoral output, employment and productivity were divided into two periods of about the same length. The first period covers 1975 to 1984, and the second period is from 1985 to 1993 depending on country data availability. The two periods are labeled as “pre-crisis” period and “post-crisis” or “adjustment” period, respectively. The crisis years were deliberately included in the earlier period (mid-1970s to 1984) in order not to bias the adjustment period growth rates downward through the inclusion of negative outliers.

We begin with an overview of recent trends in the macro performance of the thirty developing countries in the sample. Average annual growth rates for overall labor productivity, output and employment growth for the two periods under comparison are summarized in table 1.

First, and most strikingly, median productivity growth for the country sample as a whole fell to a quarter of its pre-crisis rate from 1.2 percent annually to .3 percent during the post-crisis years. In contrast, both median output growth and employment growth for the sample was stable at just below 4 percent and just over 3 percent, respectively.

Second, there have been dramatic increases in the variability of total employment growth (cf. columns 5 and 6) and in particular of overall productivity growth (cf. columns 1 and 2) from the pre-crisis to the post-crisis period.⁴ On the other hand, there was no significant change in the variability of output growth for the sample (cf. columns 3 and 4).

[TABLE 1 HERE]

The following is a crude attempt to interpret these findings in terms of the question of sustainability. Sustainability is simply defined as the nexus between overall labor productivity growth as an indicator for economic sustainability and employment expansion as an indicator of the social sustainability for the economy as a whole. In terms of pure accounting of the productivity identity—defined as real output per worker—over time the two forces are mediated through output (or demand) growth. By definition, there is an inverse relationship between productivity growth, on the one hand, and employment growth, on the other, holding demand growth constant.

In terms of the dynamic of the identity over time, however, if real output growth varies, i.e., it can either grow faster or slower than employment, then there is room for the productivity-employment relation to show qualitatively different associations over time or in cross-section. It should be stressed that this can happen purely on the basis of the accounting identity as opposed to a functional form of the relationship.

In order to take a first look at the relation between productivity and employment growth for the country data series, a country's employment record is correlated with its average productivity growth rates. First, while there is a significant negative trade-off between employment growth and productivity growth during the adjustment period for the thirty countries under investigation, a relation between the two variables cannot be

detected for the sample as a whole during the pre-crisis years. The correlation coefficient of the pre-crisis years is not statistically significant. On the other hand, for the later period, the association between overall employment and productivity growth is strongly negative; the t-statistic of the correlation coefficient (-.47) is significant at the 5 percent level of confidence.⁵

The noticeable change in the association between employment and productivity growth is the result of a multitude of variables interacting in complex ways. It can be explained in part by the after-effects of severe external shocks that the developing world was faced with during the debt crisis of the early 1980s. But there are also new forces of a changing policy regime of trade and capital account openness that impact on an economy through both direct and indirect channels. Earlier crises in Latin America, however, together with recent events in Southeast and East Asia suggest that these forces are not necessarily always beneficial for the stability and overall social and economic sustainability of a nation. We turn next to the question of how the described change in the sustainability nexus of labor productivity growth and employment expansion is reflected at the regional level.

(b) Regional patterns, 1975-1993

There are significant differences with respect to the macroeconomic performance of sub-Saharan African and Latin American countries, on the one hand, and South and East Asian countries, on the other. While sub-Saharan Africa is faced with a so-called “lose-lose” situation of, in particular, a severe “employment gap” in addition to declining productivity growth rates, Latin America has been confronted with a deep “productivity gap” for the past two decades. In contrast, South and East Asian countries find themselves on a “win-win” trajectory of high productivity growth associated with rising employment growth. We will discuss these regional findings in more detail next.

Sub-Saharan Africa

Sub-Saharan Africa is caught in a vicious circle or a “lose-lose” development trajectory. In terms of the sustainability nexus the region as a whole is subject to economically unsustainable low and falling productivity growth rates and socially unsustainable rates of job creation for the adjustment years.

For instance, the median productivity growth rate of 1.1 percent per annum for the region during the early period was only slightly below the sample’s median, but it fell by almost half during the post-crisis years. The region’s productivity mean also fell from .4 to just below zero percent. By definition the coefficient of variation increased manifold; in other words, the individual country performances have become much more dispersed and volatile during the adjustment phase when more and more resources in the region were devoted to debt servicing.

Sub-Saharan Africa is simultaneously faced with a severe employment gap, in other words, the rate at which new employment is created in the region consistently stays behind the rate of job expansion for the sample as a whole over the two periods. During the pre-crisis years the gap was only marginal at .4 percent annually, while the gap widened dramatically to 1.9 percent annually during the adjustment period.⁶

Falling or stagnating productivity growth rates together with falling employment growth lead to a “lose-lose” situation in the region as a whole. There are few countries that represent exceptions to the regional employment gap: Kenya, Botswana and Malawi, the latter two are small economies that have had disproportionate amounts of foreign aid inflows and the former has entered recently into a severe social, economic and political crisis.

Not surprising for the region, the sub-Saharan output gap remained constant, i.e. the median annual output growth rates of approximately 2.5 percent stayed behind the

median for the sample as a whole over the past two and a half decades under investigation. In a contractionary or low-growth environment, however, it is difficult to generate employment growth of the type that would be necessary in terms of the social sustainability of sub-Saharan Africa, because it would inevitably interfere with the economic sustainability of overall labor productivity improvements in these African countries.

Latin America

In Latin America productivity performance was already dismal before 1985—keeping in mind that the early period includes the crisis years. In relation to the country sample's median productivity growth rate, a Latin American productivity gap persists during the most recent years when regional median rates of productivity growth improved only marginally from the early to the later period. In half of the Latin countries in the sample, overall productivity still grows at negative annual rates so that, most importantly, substantial improvements in response to macro stabilization and reform policies remain to be seen since the early 1990s.

Stagnation of productivity growth for the region as a whole during the post-crisis years results from overall employment rates that—while they are falling marginally—are offset by relatively faster declining output growth rates. Thus, recently the social sustainability of employment in the region appears doubtful. First, the dispersion and volatility of employment growth in the Latin American countries has worsened noticeably in recent years as reflected in various measures reported in table 1. Second, in Brazil and Mexico, for example, the employment side of the sustainability nexus appears to be changing. Negative (in the case of Brazil) or falling employment growth rates (in the case of Mexico) have most recently either led to improving productivity growth (in Brazil)

or worsening performance (in Mexico) depending on how severe the drop in output growth rates were after the recessions during the early 1990s.⁷

In addition to a productivity gap, a regional gap can be found in Latin America with respect to annual output growth rates for the later of the two periods (cf. columns 3 and 4). In fact, the regional median declined from 3.5 pre-adjustment to 2.8 percent per annum during the adjustment phase and thereby fell behind the sample's median which changed only slightly from 3.7 to 3.9 percent between the two periods.

South and East Asia⁸

In terms of the sustainability nexus, most Asian countries in the sample show high productivity growth rates that are associated with rapid employment expansion. This has been attributed in part to positively reinforcing interactions between a stable policy and macroeconomic environment.⁹

Overall productivity performance of Asian economies, for instance, is remarkably different from that of the other two regions. Not only was the regional productivity median of 3.4 percent almost three times as high as the country sample's median of 1.2 percent through the crisis years, but the gap actually widened to more than ten times in recent years—3.3 percent for Asia versus .3 percent for the country sample as a whole.

Considering employment growth, the regional pattern of the Asian economies again stands apart from the other two regions. Median annual employment growth actually increased during the post-crisis years, but it did not have a negative association with aggregate productivity growth because employment in the region grew less rapidly than output. In other words, in almost all Asian economies there appears to be a “win-win” situation of high employment growth rates correlated positively with high productivity rates during the post-crisis years, while high employment growth was found to be associated with poor productivity performance in the non-Asian countries.

India is an interesting exception to this regional pattern. The Indian economy grew appreciably faster in particular during the 1980s than the median of the sample as a whole. At the same time, its annual rate of employment expansion has been disappointing, which in fact fell substantially from 2.3 to 1.4 percent annually during the post-crisis years. This together accounts for India's remarkable overall productivity growth.

In the Asian economies, median output growth of 5.7 and 6.3 percent annually during the pre- and post-crisis period was significantly higher than median output growth in the other two regions. In fact, the gap with sub-Saharan, which has been unable to catch up, and Latin America grew even wider during the adjustment years.

3. Leading versus lagging sectors

The described regional profile of productivity, employment and output growth is not entirely surprising (or new) but it serves to set the stage for investigating the underlying structural dynamics of country aggregates. In particular, are there different structural dynamics in a vicious circle as opposed to an Asian-type "win-win" situation? At the country level, changes in overall productivity growth will be decomposed into changes of the sectoral growth of output and employment over time.

(a) A decomposition exercise

The productivity identity $q=X/L$ is given where q is labor productivity, X is total output and L is total employment, i.e. here X/L is output per worker or employee. Let sectoral productivity be $q_i=x_i/l_i$, where x_i and l_i are sectoral value added and employment, respectively. Then q is equal to the sum of sectoral output-labor ratios:

$$q =(X/L) = \sum x_i/\sum l_i \quad (1)$$

Taking first-order differences with respect to time (t=0), we get

$$\frac{q_1 - q_0}{q_0} = \sum \left[g_i \theta_{i0} - \frac{q_1}{q_0} \lambda_{i0} n_i \right] \quad (1')$$

where g_i and n_i are sectoral growth rates of value added and employment:

$$g_i = \frac{x_{i1} - x_{i0}}{x_{i0}} \quad \text{and} \quad n_i = \frac{l_{i1} - l_{i0}}{l_{i0}},$$

and θ_i and λ_i are the output and employment shares of sector i , respectively:

$$\theta_{i0} = \frac{x_{i0}}{X_0} \quad \text{and} \quad \lambda_{i0} = \frac{l_{i0}}{L_0}.$$

In words, total labor productivity growth is equal to the sum of the differences between the growth rate of value added in sector i weighted by the sector's output share in period (t-1) and the sectoral employment growth rate weighted by the sector's labor share from the previous period. Note that the right hand side of the equation shows an "interaction" term (q_1/q_0) due to first-order differencing at discrete time steps.

Equation (1') provides a decomposition of the change in total productivity into shifts of the sectoral output composition and changes in sectoral employment creation. Through rewriting of the terms on the right hand side of the equation, we can identify some crucial aspects of the dynamic interaction between changes in productivity, on the

one hand, and the changing structure of output and employment in the economy, on the other:¹⁰

$$\xi = \sum \left[\theta_{i0} (g_i - n_i) + \left(\theta_{i0} - \frac{q_1}{q_0} \lambda_{i0} \right) n_i \right], \quad \text{where } \xi = \frac{q_1 - q_0}{q_0}. \quad (2)$$

Essentially, equation (2) shows how changes in overall productivity can be expressed as a weighted average of the sum of within-sector productivity shifts plus another sum of weighted reallocations of employment growth (or output growth in equation (3) below) across sectors. A reallocation term $[\theta_{i0} - (q_1/q_0) \lambda_{i0}]$ by which employment growth rates in sector i are weighted is equal to the difference between the output and labor share of the sector, i.e., it reflects differences in productivity levels (as scaled by the interaction term) across sectors in the economy. This artifact of the accounting allows us to stress the importance of the role of leading vs. lagging sectors for overall productivity growth in the economy.

Thus, according to this framework, a leading sector—like for example manufacturing or possibly certain industry services—is defined by a relatively high value of its reallocation weight, which is due to a relatively small labor share in the sector. This compares to a lagging sector, like e.g. agriculture, which tends to have a relatively high labor share in developing countries. Using the difference between the output share and the labor share of a sector as a weight for employment reallocations is, of course, just another way of restating the commonly used definition of a leading vs. lagging sectors in terms of our accounting.

Let us consider the different effects that, when added up, account for the total (positive or negative) change in overall productivity. The second term on the right hand

side of equation (2) represents the effect of sectoral employment reallocation on overall productivity change. The reallocation of employment from a sector with a low output/labor ratio to a high-productivity sector will have a positive effect on overall productivity. Therefore, leading sectors are expected to show a close relation with changes in overall productivity due to their relatively big reallocation weight, irrespective of its relative size (measured just in terms of its output or labor share) in the economy. For instance, the reallocation of employment (or output from equation (3) below) towards a leading sector will have a positive effect on overall productivity growth, all other things being equal.

In a way, this accounting framework formalizes the stylized facts of resource reallocation known from the study of structural change and economic growth. During the three decades of the Golden Age, average growth of GDP in almost all regions of the world was significantly higher than in any period of the recent history that this study is concerned with. This observation was even true for most of the very low-income economies in sub-Saharan Africa. During this historical phase many countries and regions experienced an acceleration of growth similar to the one identified by Kuznets (1966) in the early experience of today's advanced countries. Growth acceleration then and during the three decades after World War II was accompanied by, and was in part the result of, the rapid expansion of industry and the reallocation of labor and other resources from low-productivity to high-productivity activities (Syrquin, 1988, 1994).

According to the accounting equality (2), a negative impact on overall productivity growth can on the other hand result from a leading sector when sectoral output growth is negative or lags behind employment growth, i.e., productivity growth in the leading sector stagnates. Then a negative (or small) value resulting from $(g_i - n_i)$ of the first term on the right hand side is further reinforced by the leading sector's relatively high output share.

Over long periods of time, of course, if sectoral output growth persistently lags behind employment growth, *ceteris paribus* the sector's output share would fall while its employment share would rise relatively and the sector would lose its leading role in determining overall productivity growth in the economy.

Further rearranging the terms gives equation (3):

$$\xi = \sum \left[g_i \left(\theta_{i0} - \frac{q_1}{q_0} \lambda_{i0} \right) + \frac{q_1}{q_0} \lambda_{i0} (g_i - n_i) \right] \quad (3)$$

This accounting equality considers the impact on overall productivity growth by reallocating sectoral output across the economy—as opposed to employment from equation (2). High output growth rates in e.g. manufacturing are amplified by the high value of its reallocation weight, and vice versa for low-productivity activities, generally speaking service or agricultural activities.

On the other hand, the negative effect of reallocating output to a sector with a relatively low-productivity level will be offset, if the sector has high productivity growth rates ($g_i - n_i$) represented by the second term on the right hand side of equation (3). This is commonly the case in the agricultural sectors of many Asian economies which retain a relatively high labor share λ_i but they also tend to be very dynamic in terms of their productivity growth rates. In contrast, this cannot be said for the rapidly expanding service sectors in Latin American economies, for which the λ_i 's are growing but sectoral productivity is stagnant.

(b) The leading role of industry: empirical findings

From the previous discussion the industrial sector can be expected to be a good predictor in the determination of overall productivity growth. There is already much empirical literature that indicates a close relationship between long-run economic growth and the industrial sector.¹¹ This is supported by a systematic body of economic thought which not only explains why manufacturing industry should expand faster than the economy as a whole during the course of economic development but would also assign strategic causal significance to industry in raising the overall rate of growth of productivity (Singh, 1987).¹²

On the basis of the numerical findings from equation 1 above, we will examine if there is a close association between productivity growth of the industrial sector and overall productivity in an economy over time. The question is addressed by decomposing the variance of total productivity change across countries.

The cross-country sectoral data at the 1-digit level of ISIC code was combined into four main composite sectors: agriculture, industry, industry services and other services.¹³ The contribution (in percent) of each of the four sectors to the total variance can be found on the diagonal of the covariance matrix (table 2). First, the sum of the individual sector variances picks up almost all of the variance in overall productivity during both periods. Second, the variance of the industry sector shows the highest share in explaining total variance of productivity growth for both pre- and post-crisis years. Therefore, this evidence suggests that industrial sector productivity growth is indeed a good predictor for changes in overall productivity.

Table 2: Covariance matrix for overall productivity and four main sectors

(a) 1975-1984

	Agriculture	Industry	Industry services	Other services	Total productivity
Agriculture	15.99%	0.45%	1.87%	5.54%	23.87%
Industry		37.71%	1.52%	-1.52%	38.19%
Industry services			6.05%	2.47%	11.91%
Other services				19.57%	26.01%
Total productivity					100.00%

(b) 1985-1993

	Agriculture	Industry	Industry services	Other services	Total productivity
Agriculture	12.06%	2.80%	0.63%	-4.27%	11.22%
Industry		20.30%	7.64%	8.62%	39.40%
Industry services			9.71%	4.03%	21.95%
Other services				19.10%	27.37%
Total productivity					100.00%

4. A taxonomy of deindustrialization in developing countries

Structural transformations characteristic of the industrialization process have long been identified to be interrelated with long-term economic growth. Similarly, we could ask if deindustrialization has been an integral process in a “lose-lose” situation experienced by many developing countries outside of East and Southeast Asia in recent history? There has been surprisingly little effort recently—at least to our knowledge—to systematically examine deindustrialization in the broader context of the development process.¹⁴ As a consequence, the concept of deindustrialization has not been well defined with respect to economic sustainability in developing countries.¹⁵

In terms of national economic arithmetic industrialization at least up to so-called economic “maturity” or the development of a “post-industrial” society¹⁶ is accompanied by three main phenomena: (i) an increase in the share of national income from industry;

(ii) an increase in the share of the population employed in the industrial sector; and (iii) a continual rise in labor productivity in the leading industrial sector (and to a lesser extent in the agricultural sector). While these changes in the structural composition are going on, for a successful industrialization process per capita income must be rising.

The reversal of condition (i) or (ii) or both over the long period is commonly defined as deindustrialization.¹⁷ However, in the context of a “win-win” situation or virtuous circle of economic development the mere absence of any of these three main developments can be characterized as “non-industrialization,” or (if income per capita growth is also stagnant) stagnation. Thus, the proposed taxonomy for deindustrialization will pay particular attention to the contribution of labor productivity in the leading industrial sector [or condition (iii)] to aggregate productivity growth in the economy as a result of changing structures of employment and value added.

In terms of the empirical analysis, total change in productivity for the economy as a whole is explained by the relative (weighted) contributions of the four main sectors (agriculture, industry, industry services and other services). In other words, the sum of the positive and negative changes of productivity in these four sectors adds up to the total change in overall productivity. A sectoral productivity contribution can then be further decomposed into an employment effect, on the one hand, and an output effect, on the other hand. The empirical results from the exercise of decomposing the change in aggregate productivity into the sectoral components are summarized with emphasis on the industrial sector.

(a) *Productivity deindustrialization*¹⁸

Productivity deindustrialization is defined by a negative contribution of the industrial sector to overall productivity growth in an economy. A negative (or declining) contribution of industry tends to lead to a negative productivity performance for a country

as a whole. This type of deindustrialization has been widespread in particular in sub-Saharan African and Latin American countries.

For a comparison of the country experience over time, industry's contribution to total productivity change was scaled by dividing the sector's weighted growth rate by the (absolute) sum of productivity changes for all four sectors in a given period. This gives us the percent contribution of industry to the change in overall productivity for the economy as a whole. A negative industrial sector contribution then represents a negative sectoral productivity growth rate. In order to illustrate this point, let's suppose the weighted productivity growth rate of the industrial sector is -3 percent in a given period, while the other three sectors show zero percent change. In this case, industry's contribution to account for the country's observed overall productivity growth rate of -3 percent is equal to -100 percent.

Cross-country evidence is presented in graph 1. The horizontal axis shows industry's average contribution to total productivity change for the pre-crisis period (1975 through 1984), and the vertical axis for the adjustment period. The lower half of the graph then defines an area of productivity deindustrialization, while industrialization of a country takes place between the two periods in the upper half of the graph. The 45° line provides us with information about a worsening (below the line) or an improvement (above the line) in the productivity performance of a country's industrial sector over time.

[GRAPH 1 HERE]

First, productivity deindustrialization cannot be found in Asian countries, neither before nor after 1985 (with the exception of the Philippines). Indeed, the industrial sector's impact on positive change in productivity in the economy as a whole is

increasing during the later period. Almost all Asian economies in the sample lie above the 45° line.

Second, productivity deindustrialization is widespread in the other two regions where it is always associated with negative changes in overall productivity. During the adjustment years, however, it has become a pattern that is dominated by Latin American countries such as Colombia, Costa Rica, Guatemala, Panama, Peru and in addition Turkey whose economy is sometimes classified as “Latin-style”.

In sub-Saharan Africa further productivity losses of the early period could only be prevented on the basis of substantial labor shedding in the industrial sector which will be discussed in more detail below. It should be pointed out that the resulting marginal improvements in the rate of industrial productivity growth are more than offset by either a significant negative contribution of services (Botswana, Kenya and South Africa) or of agriculture (Malawi and Zimbabwe) resulting in declining rates of overall productivity growth in the region as a whole.

On the other hand, Chile, that is arguably characterized as a case of post-crisis success owing to neo-liberal reforms, for example shows a dramatic decline in the (weighted) average rate of industrial productivity as a result of the sector absorbing more labor than is validated by the expansion of value added. Indeed, a positive annual rate of productivity growth for the economy as a whole is mainly accounted for by a combination of rapid growth of industry services of finance, insurance, real estate and business services (*FIRE*) and construction. Whether this is a sustainable situation or whether it is only a temporary boom of the non-tradables goods sectors which may be an indication of an overvalued exchange rate remains to be seen. There are recent signs for optimism, however, because evidence suggests that active exchange rate policies could prevent the Chilean currency from appreciating (Dornbusch, Goldfajn and Valdes, 1995).

The case of Mexico exemplifies a general pattern of productivity deindustrialization in Latin America after 1985 (and to some extent for sub-Saharan Africa during the early period). Mexico's weighted annual rate of industrial productivity growth fell substantially beginning in the early 1980s which was a time when stepped-up reforms of trade liberalization were introduced which then lead to the ratification of NAFTA in 1992. The decline in industrial productivity growth results from Mexican industrial output growing annually at less than half the rate than before the early 1980s crisis, while the weighted annual rate of growth of industrial jobs remained constant during the adjustment phase.

What appears to explain productivity deindustrialization in Mexico and other countries in the region is an employment absorbing industrial sector (discussed in more detail below) that is not validated by an expansion of industrial value added leading to negative rates of productivity growth not only for this sector, but this situation also feeds negatively into the productivity performance of the economy as a whole.

Moreover, there are signs that when this model is subject to increased trade liberalization reforms in a stabilization policy regime of austerity, productivity growth can only be restored through a reduction in industrial employment. The numerical results from the decomposition exercise provide evidence that labor shedding of this type in the industrial sector is occurring in Bolivia, Brazil, Peru and also South Africa and most recently in Mexican manufacturing when industry is further disaggregated.^{19,20}

(b) *Employment deindustrialization*

Employment deindustrialization is not as widespread across the country sample as productivity deindustrialization. In general, however, a labor absorbing industry sector tends to be associated with employment creation for the country as a whole, while contracting industrial employment tends to lead to aggregate job loss in the economy as

a whole. There is clear evidence of employment deindustrialization in sub-Saharan African countries, while in Latin America and Asia industry has played the role of an “employment absorber.”

In almost all Latin American countries, industry has increased its relative contribution to total employment growth during the adjustment phase after 1985 with negative consequences for overall productivity growth as discussed above. For the early period Bolivia and Peru are the exceptions to this Latin American sectoral pattern and the Bolivian annual rate of industrial employment growth continues to be negative during the recent years when it is joined by Brazil (cf. graph 2).

These findings are in line with recent work by Amsden and van der Hoeven (1996) which showed that sharp reductions in manufacturing real wages in Latin America lead to a situation of “sticky employment” associated with either a decrease or stagnation in the growth of labor productivity over the course of the 1980s. That is to say, dramatic wage reductions as a result of structural adjustment programs made the manufacturing sectors less efficient as opposed to more efficient as is predicted by proponents of orthodox economics.

[GRAPH 2 HERE]

Before and during the global recession of the early 1980s, employment deindustrialization has predominantly been a severe problem in sub-Saharan African economies such as Ghana, Zambia and Zimbabwe and more recently also in South Africa. Botswana represents a remarkable, though perhaps not surprising, exception to this regional pattern. Its (weighted) growth rate of industrial employment doubled, but this came at the cost of a severe decline in the annual rate of industrial productivity growth.

In contrast, there is *no* deindustrialization of this type in Asia (with the exception of a brief episode in Sri Lanka). In fact, for the fast growing countries like Malaysia and Thailand pre-1993 the contribution of industrial employment growth to total employment creation expanded relative to the other sectors.²¹ Moreover, in all Asian countries (except the Philippines) persistent employment growth has not interfered with productivity industrialization. It indicates that there exists a “win-win” situation not only at the macro level but also in industry. This can be said neither for Latin America nor for sub-Saharan Africa.

(c) Output deindustrialization

The question whether specific sector proportions of output growth are responsible for the significant regional patterns of productivity growth as identified in section 2 will be addressed next. More specifically, are these outcomes associated with substantial differences in the relative output contribution of the industrial sector to overall output growth? We find that the patterns for output deindustrialization are much less clear.

The changes in value added of the four main sectors sums to the total change in gross domestic product (GDP) of the economy as a whole.²² For the thirty countries in the sample and comparing the two periods before and after 1985, graph 3 shows the results from decomposing the total change in output for the industrial sector.

[GRAPH 3 HERE]

For the period through the onset of the debt crisis, industry’s contribution to output growth was actually negative for a number of countries.²³ In sub-Saharan Africa, output deindustrialization was found for Ghana, Sierra Leone and Zambia, and Bolivia,

Peru and Venezuela in Latin America (again the Philippines is not a very surprising exception in the group of Asian countries). In Ghana, Bolivia and Peru, deindustrialization actually resulted in negative growth rates for the economy as a whole before 1985.

Even though industry's dramatic negative contribution to total output growth could be halted in some countries, output deindustrialization continues to be a problem in some countries in sub-Saharan Africa and Latin America during the adjustment period. For Zambia and Peru, we still find negative industrial output growth, and deindustrialization newly occurs in South Africa, Jordan and most substantially in Brazil. In fact, the Brazilian industrial output loss could not be offset by the contribution of the other three sectors resulting in no growth for the economy as a whole during recent years.

The contribution of industry to total output growth also declines particularly in non-Asian countries, like for example Botswana, Kenya, Guatemala and Puerto Rico. In contrast, a continuously rising (or constant) contribution of industrial value added to aggregate growth (or industrialization) persists in all of the Asian countries in the sample through the recent years.

Moreover, while the rate of output growth of the Asian service sector also increases as in many non-Asian economies, both the level and the trend of its relative contribution to the aggregate change in output are substantially lower. In fact, for those countries where industrialization (measured by industry's contribution to total output growth) accelerates the service sector's relative position despite its expansion is declining due to a rapidly growing industrial sector (Pieper, 1998). As discussed in the context of leading versus lagging sectors, an increase in the relative importance of services in the other two regions may, however, have negative implications for overall productivity growth in the future, because services tend to be low productivity activities.

In concluding this section, the proposed taxonomy for deindustrialization showed a leading role for industry in determining the level and trend of aggregate outcomes for productivity and employment growth. A negative annual rate of productivity growth in the industry sector is associated with negative productivity growth for the economy as a whole. Moreover, for this association to occur the size of the industry sector (measured in terms of its labor or output share) does not appear to matter because it holds for Malawi as much as for Turkey which has a more advanced industrial base.²⁴

In Africa, for instance, the lack of foreign exchange is one of the main reason for industrial stagnation since the early 1980s. African economies found it increasingly difficult to raise funds from international capital markets, and increased debt servicing requirements absorbed a growing proportion of their foreign exchange receipts. Ndulu (1996) summarizes the prospects for sustainability: “The foreign exchange gap is widely regarded to be most constraining on growth and development in sub-Saharan Africa, and one that would require the most support to alleviate in the process of transforming these economies to more sustainable structures over the long term. Foreign resource inflows are needed to support not only the expansion of productive capacity but also the utilization of installed capacity and growth in the medium term.”

In other words, for sub-Saharan Africa to break the vicious circle of low productivity, output and employment growth and in order for the region to have a chance of catch-up a broad based relief of debt repayments and the foreign exchange constraint is most pressing. Otherwise, even though sub-Saharan economies overall appear stabilized for now, they may be bound for more widespread social and political instability.

Second, the evidence shows that countries adjusted differently to the changing international economic and political environment since the early 1980s. The Latin American story is one of macro stabilization policies and neo-liberal structural reforms of trade and financial liberalization. As was expected (and intended by the reform

packages), a sector with a high share of tradable products in its output basket, like the industrial sector, finds itself subject to growing international competition. But it appears that currency overvaluation, i.e. a relative price shift in favor of the non-tradables sectors that results from the interaction between exchange-rate-based stabilization policies and increasing openness may force the industrial sector to contract.

The experience of some Latin American countries since the early 1990s illustrates the case of foreign-capital-led expansion followed by periods of induced contraction. This ongoing process has been labeled “stop-go cycles” of growth (Singh, 1995; Amadeo, 1996). Exchange-rate-based stabilization policies that have not been coordinated with increasing trade and capital account openness made these stop-go growth cycles inevitable (Fanelli and Frenkel, 1995).²⁵

While the regions overall macroeconomic stability, particularly of low inflation rates, has improved, the future social and economic sustainability depends on economies being able to manage and regulate volatile international capital flows in order to restore growth in the region. Since the early 1990s large foreign capital inflows into the region that resulted from capital account liberalization, have forced Latin American governments to stabilize these inflows (as well as the outflow of domestic capital) by raising interest rates. For example, in response to the Asian financial crisis, Brazil was forced to double base interest rates to 45 percent during the fall of 1997 to defend the currency from speculative attack. Interest rates remain at over 30 percent a year and there are ample signs of a further slowdown of the Brazilian economy. As a result official unemployment rates have risen sharply to over 7 percent indicating that another “go-stop cycle” of growth is underway.

Industrial output contraction is inevitably followed by employment contraction when the sector is overexposed to international markets. In terms of the accounting framework, the contraction of leading sectors, however, has negative effects for the rate

of growth of productivity in the economy as a whole, and therefore for its medium to long-term growth prospects. Prolonged phases of deindustrialization may then become an integral part of a vicious circle of development.

The main difference between a vicious versus a virtuous circle of development, it has been argued, lies in the application of consistent industrial policy packages. Asian governments intervene proactively in the market to develop technological capabilities and to target and protect infant-industries (Amsden, 1989; Wade, 1990; Chang, 1994). Commonly, the success of industrial policy was aided by a favorable macroeconomic policy environment of low-cost finance capital and export promotion (Singh, 1995). What the proponents of neo-liberal or market-friendly policies tend to neglect is the mutually beneficial relationship between successful industrial policy and development and overall macroeconomic stability of domestic prices, exchange rate and balance of payments.²⁶

Korean industrial policy, for example, was effective in relieving the balance-of-payments constraint and thereby also aided overall macroeconomic stability. A current account balance at the desired growth rate can help to avoid the “stop-go cycles” which many economies in Latin America have experienced since the late 1980s. This, moreover, will reduce the cost of capital since there is no need to curb current account deficits through fiscal restraint and tight monetary policy. Thus, macroeconomic stability and industrial policy and a developing economic structure interact with each other in a virtuous circle.

5. High road versus low road development

Is there a necessity for continued industrialization in the developing world? It has been argued that economic growth should not be an essential objective for developing countries because it does not necessarily enable a nation to achieve economic development. That is certainly true, but it would be a mistake to assume that economic

development can be achieved without economic growth. Moreover, the most compelling economic and social reason for the developing world to continue to industrialize is the enormous problem of global unemployment.

Developing countries today face the challenge of dramatic demographic transitions, and of, in particular, working-age cohorts currently entering local labor markets. Unemployment or better underemployment has already been very severe for many countries, but there is also the necessity of providing productive jobs for a labor force that is estimated to grow at approximately 3 percent a year.²⁷ In Africa, the rate of labor force growth is even expected to increase in the foreseeable future to 3.5 percent a year (UN, *World Social Report* 1993 cited in Singh and Zammit, 1995). In addition, the labor force expands due to increasing female labor force participation rates for complex reasons that are not discussed here.

While here the concept of a “socially necessary growth rate” is used to provide us with a reference point for data comparison rather than for the formulation of development strategies, it is worth mentioning that in the late 1970s/early 1980s similar debates took place regarding so-called “redistribution with growth” and the “basic needs approach” to combat poverty internationally. Essentially the idea of these strategies was that in order to substantially decrease the numbers of the poor, world output would have to grow at 8-10 percent annually. Since it is unlikely that growth rates of such high magnitude can be sustained for long periods of time, the redistribution of resources worldwide to alleviate poverty was called for through a “New International Economic Order.”

As a result of the debt crisis, however, these ideas dropped from the development agenda because the basic needs approach paid little attention to national and international macroeconomics particularly structural adjustment policies which then took predominance over poverty alleviation (van der Hoeven and Rodgers, 1995).²⁸ The

previous (and following) investigations have attempted to remedy (at least in part) this shortcoming by associating economic policy regimes with structural performance.

On the basis of the cross-country evidence, table 3 explores the idea of a “socially necessary rate of growth.”²⁹ On the one hand, the matrix compares the observed employment performance of countries to the socially necessary rate of employment growth here defined at 3 percent annually in accordance with the expected increase in labor supply in developing countries. On the other hand, observed productivity growth rates are compared to the long-term trend rate of productivity growth during the period 1950-80, or a Golden Age rate which has also been about 3 percent a year (Singh and Zammit, 1995).

Table 3: Regional patterns: employment and productivity growth 1975-1993

(a) 1975-1984

	“economically unsustainable” productivity growth < 3%	“economically sustainable” productivity growth >= 3%
“socially unsustainable” employment growth < 3%	<p><i>low road countries</i></p> <p>Sierra Leone South Africa Zambia Zimbabwe</p> <p>Bolivia Chile Guatemala Peru Puerto Rico</p> <p>India</p>	<p>Indonesia Korea Myanmar Sri Lanka</p>
“socially sustainable” employment growth >= 3%	<p>Brazil Colombia Costa Rica Mexico Panama Venezuela</p> <p>Turkey</p> <p>Botswana Ghana Kenya Malawi</p> <p>Malaysia Philippines Thailand</p>	<p><i>high road countries</i></p> <p>Singapore</p> <p>Jordan</p>

(b) 1985-1993

	“economically unsustainable” productivity growth < 3%	“economically sustainable” productivity growth >= 3%
“socially unsustainable” employment growth < 3%	<i>low road countries</i> Sierra Leone South Africa Zambia Zimbabwe Bolivia Brazil Mexico Peru Myanmar Philippines	Ghana* India Singapore
“socially sustainable” employment growth >= 3%	Chile Colombia Costa Rica Guatemala Panama Puerto Rico Venezuela Jordan Turkey Botswana Kenya Malawi Sri Lanka	<i>high road countries</i> Indonesia Korea Malaysia Thailand

Notes: *Output data for Ghana is only available for 1985-86, but employment fell by a staggering 11 percent for the period, thus productivity growth is not only expected to be positive but substantially positive.

Source: Author’s calculations.

A significant pattern of regional differences emerges again. Out of eight sub-Saharan African economies four (Sierra Leone, South Africa, Zambia and Zimbabwe) fall into the “low road” category defined as growth rates below the socially necessary 3 percent for both employment and productivity. It is the low road because this model’s social and economic sustainability is highly questionable.

At the other extreme, four (Indonesia, Korea, Malaysia and Thailand) out of nine Asian economies have taken the “high road” with both employment and productivity growth rates greater than the socially necessary rate. These Asian NICs have been able to sustain high output growth rates through the 1980s, especially in the manufacturing sector. India is a special Asian case with high productivity growth but below benchmark rates of job growth. If the high output growth of the period, however, can be sustained in spite of recent liberalization efforts, India might be able to join the other Asian economies on the high road.

The last category is that of above 3 percent job creation paid for with productivity growth that is below the Golden Age rate of 3 percent per year. This is essentially the model of Turkey and Latin America (seven out of eleven countries: Chile, Colombia, Costa Rica, Guatemala, Panama, Puerto Rico and Venezuela) with socially sustainable employment growth rates but economically unsustainable productivity gaps. The question of what road they will end up taking is very imminent because the remaining four Latin countries from the sample (Bolivia, Brazil, Mexico and Peru) are grouped with the low road economies. These findings suggest that in addition to the African countries a new group of low road countries is forming in Latin America.

To pursue this exercise further these regional patterns from the period after 1985 are compared to the period of pre-crisis and crisis years in table 3(a). The striking finding is that unlike the adjustment phase no straightforward regional patterns can be detected except for the group of sub-Saharan African economies. At the aggregate level there appears to be no dynamic with respect to productivity growth or employment creation in these economies even during the pre-crisis years. The sub-Saharan continent had already begun its low road trajectory before the structural adjustment phase, so that the “lost decade” of the eighties has its precedence in the 1970s.

Second, from the other non-African low road countries only India could turn its low employment growth from before 1985 into dramatic productivity growth in the post-crisis years by continuing with import substitution industrialization policies through the late 1980s. On the other hand, the five low road Latin American countries could not restore productivity growth rates during the adjustment phase for which, however, three of them show a socially sustainable employment record.

Third, a new development appears to emerge for the two big Latin American economies for which most recent employment data through the mid-1990s is available. While Brazil and Mexico were able to sustain high employment growth through the late 1980s they can no longer afford to do so in a trade-liberalized policy regime with heightened international competition. So far, however, their economic structures preclude employment losses to be turned into productivity gains.

Finally, only two countries from the sample of developing countries could be found on the high road prior to adjustment—Singapore and Jordan (which fell behind in the second period due to the drying up of foreign exchange). Moreover, for countries that succeeded in moving onto the high road trajectory it did not make a difference if they previously had low employment with high productivity or high employment with low productivity.³⁰ Most strikingly, only Asian countries are on a socially and economically sustainable trajectory in the recent period. In conclusion, these Asian cases not only have in common non-liberal policy regimes as has been pointed out convincingly in the literature, but the evidence presented here also suggests that they share a common pattern of structural economic dynamics in particular with regard to industrial sector development.

Notes

¹ We are exclusively concerned with questions of labor productivity defined as output per worker as opposed to capital/output ratios or total factor productivity. Therefore, throughout the paper “overall” or “total productivity” stands for labor productivity in the economy as a whole unless otherwise noted. Sectoral productivity then is equal to the sector’s output (measured by its real value added) divided by the number of people employed in that sector.

² For a detailed description of the data set refer to the data appendix; a list of the countries included in the sample is given in table 1.

³ In response to the debt crises came a shift in the policy regime toward neo-liberalism. The convergence of policy regimes can be explained in part by two factors. First, beginning with the debt crisis the Bretton Woods institutions’ policy interventions are until this day laden with neo-liberal ideology. This so-called Washington Consensus was administered through stabilization and structural adjustment programs that imposed trade and financial liberalization and austerity policies on countries through a system of conditionalities (Pieper and Taylor, 1998). Second, Rao (1996) offers a complementary explanation: “...neo-liberal influence has grown cumulatively: the pursuit of liberalization in individual countries not only affected their internal economies but also altered the global environment facing each of them, an alteration that made the pursuit of autonomous policies increasingly precarious or, at least, increasingly unfashionable.” See Horton, Kanbur and Mazumdar (1994) for the timing of structural adjustment programs in a number of developing countries.

The *World Development Report* 1991 is commonly regarded as a prime representation of the market-friendly approach to development. For a summary and critique see Fanelli, Frenkel and Taylor (1992).

⁴ The dispersion of observations for productivity growth—measured by the coefficient of variation—is almost twice as high during the later period. Correspondingly, the sample’s frequency distribution worsened from 9 countries showing negative annual growth rates of productivity pre-adjustment to 12 during the adjustment period. Similarly, the coefficient of variation also more than doubled for average employment growth rates for the sample. The rising variation in employment growth took place at the bottom end of the frequency distribution.

⁵ For a test on structural change between the two periods, the null hypothesis that there is no structural change cannot be rejected at the 5 percent confidence level.

⁶ The volatility in employment growth as indicated by three different measures of variation reported in table 1 increased manifold in sub-Saharan Africa between the early and the later period. This growing trend is also significant but less pronounced in the group of Latin American countries, while for Asia it is declining.

⁷ Compare also Ros (1997) for the case of Mexico and Amadeo and Pero (1997) for Brazil.

⁸ The following discussion of Asia cannot address issues that are related to precursory events and the resulting financial crisis itself in Southeast and East Asia beginning during July 1997, because there is a considerable time-lag (about 3-5 years) in the availability of the types of cross-national data by sector used here. Further, the empirical analysis of the study was completed by March 1997. For most Asian countries in the sample the data covers events through 1993.

⁹ In practice, “Asian-style” reforms tend to be qualitatively different from a neo-liberal or “market-friendly” policy mix. For original work on the “Asian developmental state”, compare Amsden (1989) and Wade (1990). Singh (1995) and Wade (1995) offer summaries of the ongoing debate.

The recent controversy over the question what explains Asia’s economic success culminated in the World Bank’s release of the *East Asian Miracle* report in 1993. For a critical assessment of the report see Amsden (1994). In light of the recent financial crisis in Asia, proponents of the former have discredited the “Asian miracle model” since as “crony capitalism.”

¹⁰ I am grateful to Lance Taylor for pointing this out to me.

¹¹ The long tradition of empirical investigations of the relationship originates with the famous Verdoorn (1949) article. From analyzing historical data series for various countries, Verdoorn suggested the existence of a fairly constant relation over a long period between the growth of labor productivity and the volume of industrial production. There has been a great deal of

literature on the subject since, most notably, Kaldor's renowned Inaugural Lecture in Cambridge. Kaldor (1966, 1978) was also the first to discuss the broader implications of the law for economic growth. For a review, see McCombie (1987).

Although the so-called Verdoorn Law was originally discussed in terms of the differences in productivity growth of the advanced countries, the fundamental relationship that it postulates is now recognized as having a wider significance for the more general process of economic growth and development. The quantitative analysis of structural change in general and its relation to economic growth was, of course, most comprehensively investigated by Kuznets (1966; 1971). See also Chenery et al. (1986) and Syrquin (1994).

¹² Just to mention the classic articles of Young (1928), Rosenstein-Rodan (1943) and Scitovsky (1954) on economies of scale in industry.

¹³ According to the ISIC code at the 1-digit level, the group of *other services* is comprised of wholesale and retail trade, hotel and restaurant services plus social and personal services; hereafter referred to as "services." *Industry services* include the following sectors: public utilities, transport, storage and communication, and finance, insurance and real estate and business services. *Industry* is made up by mining and quarrying, manufacturing and construction.

¹⁴ Fajnzylber (1990) offers a remarkably comprehensive approach for analyzing the problems of industrial restructuring in Latin America. See also Amadeo (1997) and Dancourt (1997) for empirical assessments of recent developments in the Brazilian and Peruvian industrial sectors. And for an analysis of supply-side problems of African industry see Lall (1992) and Lall and Stewart (1996).

¹⁵ In the context of industrial policies in advanced capitalist countries the issues surrounding a proper definition of deindustrialization were publicly debated during the late-1970s and early 1980s particularly in the United Kingdom and the United States (for the U.K., see for example Singh, 1987; Rowthorn and Wells, 1987). Essentially, this debate attempted to establish quantitative as well as qualitative criteria to guide policy-makers in their decisions of when to concern themselves with deindustrialization. The latter criteria dealt with questions of the interaction between an "efficient" industrial sector and the achievement of overall macroeconomic objectives of stability and growth such as full employment at a socially acceptable level, distribution of income, and external balance. Indeed, a lot of the deindustrialization arguments relating to "qualitative" aspects of economic sustainability are—with some modifications—applicable to the general context of developing countries.

¹⁶ The concept of "maturity" of an economy is not very well defined; in fact, it is generally used tautologically for the post-industrial phase of advanced countries or the so-called "service economy." It generally is identified with the "natural" outcome of the long-run process of economic development when the shares of output and employment in the service sector rise at the expense of the industrial sector or more specifically the manufacturing sector.

¹⁷ See also endnote 15.

¹⁸ A complete set of the numerical results from the decomposition exercises for this and the following sections can be obtained from the author upon request.

¹⁹ Cf. Amadeo and Pero (1997) and Dancourt (1997) for supporting evidence on the Brazilian and Peruvian cases, respectively.

²⁰ Results not reported here for the service sector suggest that, not surprisingly, the contribution of "other services" to overall productivity growth tends to be negative for the country sample overall. This, however, does not necessarily result in negative productivity growth for an economy as a whole, it is only in combination with a negative (or declining) contribution of industry that leads to a negative overall productivity performance.

Further, there are substantial differences between the Asian service sector, on the one hand, and the sub-Saharan African and Latin American, on the other. First, the magnitude of the negative contribution of other services to overall productivity growth in Asian economies is appreciably lower than it tends to be in countries in the other two regions, and in particular in Latin America. Second, the negative impact diminishes in all Asian countries. For more detailed discussions of evidence from the decomposition exercise not presented here see Pieper (1998).

²¹ In addition to industry the Asian agricultural sector has been a major source of productivity growth as a consequence of labor moving to the urban centers especially during the early period.

For example, in Indonesia, Korea, Malaysia and Sri Lanka agricultural output growth fell behind relative to all the other sectors, but particularly with respect to a rapidly expanding industrial sector, while the weighted rate of agricultural employment growth dropped even faster leading to substantial productivity growth in the sector (Pieper, 1998). In contrast, the problem of a persistent productivity gap in agriculture in Mexico was recently pointed out by Ros (1997).

²² GDP at factor prices (minus "Producers of Government Services") was obtained from the *National Accounts Statistics*.

²³ In results from the decomposition exercise not reported here none of the other three main sectors showed a similar pattern of a substantial negative contribution to aggregate output growth for the same period (cf. Pieper, 1998).

²⁴ This issue needs further investigation. If the size of a dynamic industrial sector does not matter for the generation of a virtuous circle or "win-win" situation, then this has direct bearing on the development models that envision a "big push" or "balanced growth." Instead the targeting of a few key industries may perhaps be a viable and sustainable strategy along the lines of the development model of the European Nordic countries. On the basis of a few leading industries, these economies built diversified economic structures with efficient backward and forward linkages and developed egalitarian societies. See Menzel and Senghaas (1986) for an analysis of the Swedish and Danish cases and their applicability in developing countries.

²⁵ In terms of macro/sectoral interactions, Fanelli and Frenkel (1995) argue that the channels through which adjustments from the macroeconomy are transmitted to the economic structure are through shifts in relative prices which can create imbalances and volatility. For a full discussion of this issue, see Pieper (1998).

²⁶ The *World Development Report* 1991 is commonly regarded as a prime representation of the market-friendly approach to development. The Report views public intervention apart from provision of education, some infrastructure, macroeconomic stability, and the "rules of the game" as economically inefficient essentially due to government failure. For a summary and critique see Fanelli, Frenkel and Taylor (1992). With respect to the East Asian experience, see World Bank (1993).

²⁷ In the absence of unemployment compensation people are forced to enter into any economic activity no matter how low the pay or non-productive that may be. The problem of unemployment in developing countries, therefore, manifests itself generally in the form of what Joan Robinson called "disguised unemployment," or as underemployment (Singh and Zammit 1995).

Eatwell (1995) applies the concept of "disguised unemployment" to analyze recent trends in the G7 where differences in national social security systems explain inter-country differences in the level of "official" unemployment. But when disguised unemployment is accounted for these differences are much less pronounced across OECD countries.

²⁸ Van der Hoeven and Rodgers (1995) offer a second explanation for the failure of the "basic needs approach:" "those promoting basic needs policies incorrectly assumed the presence of a benevolent and efficient state, an assumption which this approach had in common with most other development strategies."

²⁹ Singh and Zammit (1995) develop this idea on the basis of past relationships between output, employment and productivity growth. According to their calculations countries need to grow at a rate of 6 percent per year to meet the employment needs of new entrants to the labor force at 3 percent productivity growth and current levels of income. Ros (1997) applies a concept of a "socially necessary growth rate" for the case of Mexico.

³⁰ Note that no country in the sample succeeded in moving directly from the low road to the high road trajectory during the adjustment phase which the Bretton Woods type structural reforms would have predicted. The reallocation of factors of production in particular of labor as a response to free-market incentives is expected to result in efficiency gains at full employment.

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Appendix: Data sources

Sectoral data for real value added

The country data for value added used in the paper is from the annual series “Gross Domestic Product by Kind of Activity (at constant prices)” of the *U.N. National Accounts* which was provided by the United Nations Statistics Division, New York. The data is in national currency and is arranged according to the International Standard Industry Classification (ISIC) code at the 1-digit level, i.e. it covers nine main “activities” or sectors. The sum total of these nine sectors’ real value added (excluding “producers of government services”) gives the gross domestic product (GDP) at factor prices. For most countries, the series covers the period from the mid-1970s to 1993.

For Brazil, sectoral and total output data series were computed from “Country Pages, GDP at factor cost,” *World Tables*, World Bank. Their level of disaggregation includes only three main sectors: agriculture, industry and services.

Sectoral data for employment

The country data for sectoral employment was provided by the International Labour Office, Geneva, also published in *Yearbook of Labour Statistics*. It is an annual series that covers (at maximum) the period from 1975 to 1993. Just like the data from the *U.N. National Accounts*, the series is disaggregated at the 1-digit level of ISIC.

Because its country coverage is smaller than the output series used in the paper, additional sectoral employment data was taken from national sources for Brazil (for 1990-1995: *Relação Anual de Informações Sociais (RAIS)*, Departamento Intersindical de Estatística e Estudos Sócio-Econômicos (DIEESE), Rio de Janeiro), Peru (*Compendio Estadístico*) and Mexico (*Sistema de Cuentas Nacionales de México*).

Sectoral labor productivity

Sectoral labor productivity for the countries was computed by combining the two data series of sectoral value added and employment described above. In other words, sectoral productivity is defined as sectoral value added (here in national currency) divided by the number of persons employed in the sector.

Table 1: Total labor productivity, output and employment growth

	labor productivity (annual growth rate)		output (annual growth rate)		employment (annual growth rate)	
	mid-1970s-1984	1985-early 1990s	mid-1970s-1984	1985-early 1990s	mid-1970s-1984	1985-early 1990s
	(1)	(2)	(3)	(4)	(5)	(6)
SUB-SAHARAN AFRICA						
Botswana	3.8%	-2.4%	11.4%	8.3%	7.6%	10.7%
Ghana	-3.4%	--	-0.3%	--	3.1%	-11.0%
Kenya	1.6%	0.7%	5.2%	4.4%	3.6%	3.7%
Malawi	-3.0%	-2.9%	2.5%	3.9%	5.5%	6.8%
Sierra Leone	1.0%	0.7%	2.4%	1.4%	1.4%	0.7%
South Africa	0.8%	0.3%	3.0%	0.2%	2.2%	-0.1%
Zambia	1.2%	2.0%	0.4%	1.7%	-0.8%	-0.3%
Zimbabwe	1.2%	1.0%	1.1%	2.6%	-0.1%	1.6%
MIDDLE EAST & TURKEY						
Jordan	4.1%	-7.7%	10.7%	-1.2%	6.6%	6.5%
Turkey	0.1%	-0.8%	3.6%	4.8%	3.5%	5.6%
LATIN AMERICA & CARRIBEAN						
Bolivia	-1.7%	0.1%	-0.5%	1.6%	1.2%	1.5%
Brazil*	-0.3%	4.0%	3.5%	0.0%	3.8%	-4.0%
Chile	1.5%	2.2%	4.1%	6.8%	2.6%	4.6%
Colombia	-0.7%	-1.9%	3.6%	3.9%	4.3%	5.8%
Costa Rica	-1.1%	1.7%	2.8%	4.7%	3.9%	3.0%
Guatemala	0.3%	-1.0%	2.5%	2.8%	2.2%	3.8%
Mexico	1.8%	0.3%	5.1%	2.0%	3.3%	1.7%
Panama	0.4%	-1.0%	4.5%	2.5%	4.1%	3.5%
Peru	-2.3%	-2.1%	-0.1%	0.6%	2.2%	2.7%
Puerto Rico	2.2%	1.9%	3.7%	4.9%	1.5%	3.0%
Venezuela	-3.6%	-0.6%	0.3%	3.5%	3.9%	4.1%
SOUTH & EAST ASIA						
India	1.8%	4.5%	4.1%	5.9%	2.3%	1.4%
Indonesia	3.7%	3.1%	5.6%	6.3%	1.9%	3.2%
Korea	6.3%	6.0%	8.6%	9.2%	2.3%	3.2%
Malaysia	2.7%	3.3%	6.6%	6.4%	3.9%	3.1%
Myanmar	3.4%	-1.3%	5.7%	0.1%	2.3%	1.4%
Philippines	-2.8%	-0.6%	0.3%	2.0%	3.1%	2.6%
Singapore	4.2%	4.5%	9.0%	7.1%	4.8%	2.6%
Sri Lanka	5.2%	-1.2%	5.5%	4.4%	0.3%	5.6%
Thailand	2.3%	5.5%	6.9%	9.5%	4.6%	4.0%
Median 30 countries	1.2%	0.3%	3.7%	3.9%	3.1%	3.1%
Mean 30 countries	1.0%	0.6%	4.1%	3.8%	3.0%	2.7%
Standard Deviation	2.6%	2.9%	3.1%	2.8%	1.8%	3.7%
Coefficient of Variation~	253%	469%	77%	75%	60%	136%
Variance	0.07%	0.08%	0.10%	0.08%	0.03%	0.14%
Frequency D > 3.0% (D > 6.0%)^	7 (1,0,5)	7 (0,1,6)	6 (1,0,4)	7 (1,1,5)	16 (4,6,4)	13 (3,5,3)
3.0% = D > 1.5% (6.0% = D > 3.0%)	6 (1,2,3)	4 (1,3,0)	12 (1,6,4)	9 (2,4,2)	9 (1,4,4)	9 (1,4,4)
1.5% = D > 0.0% (3.0% = D > 0.0%)	8 (4,3,0)	6 (4,2,0)	9 (5,3,1)	11 (4,5,2)	3 (1,1,1)	4 (1,1,2)
0.0% = D = -1.5% (0.0% = D = -3.0%)	3 (0,3,0)	7 (0,3,3)	3 (1,2,0)	2 (0,1,0)	2 (2,0,0)	2 (2,0,0)
-1.5% > D = -3.0% (-3.0% > D = -6.0%)	4 (1,2,1)	4 (2,2,0)	0	0	0	0
-3.0% > D (-6.0% > D)	2 (1,1,0)	1 (0,0,0)	0	0	0	2 (1,1,0)
Median sub-Saharan Africa	1.1%	0.7%	2.4%	2.6%	2.7%	1.2%
Mean sub-Saharan Africa	0.4%	-0.1%	3.2%	3.2%	2.8%	1.5%
Standard Deviation	2.4%	1.8%	3.7%	2.7%	2.8%	6.3%
Coefficient of Variation	614%	-1863%	117%	83%	100%	419%
Variance	0.06%	0.03%	0.14%	0.07%	0.08%	0.40%
Median Latin America	-0.3%	0.1%	3.5%	2.8%	3.3%	3.0%
Mean Latin America	-0.3%	0.3%	2.7%	3.0%	3.0%	2.7%
Standard Deviation	1.8%	1.9%	1.9%	2.0%	1.1%	2.5%
Coefficient of Variation	-581%	578%	72%	66%	36%	94%
Variance	0.03%	0.04%	0.04%	0.04%	0.01%	0.06%
Median Asia	3.4%	3.3%	5.7%	6.3%	2.3%	3.1%
Mean Asia	3.0%	2.6%	5.8%	5.6%	2.8%	3.0%
Standard Deviation	2.6%	2.9%	2.6%	3.1%	1.4%	1.3%
Coefficient of Variation	87%	111%	44%	55%	51%	43%
Variance	0.07%	0.09%	0.07%	0.10%	0.02%	0.02%

Notes:

*Brazil: output growth rates were computed from *World Tables* 1995.

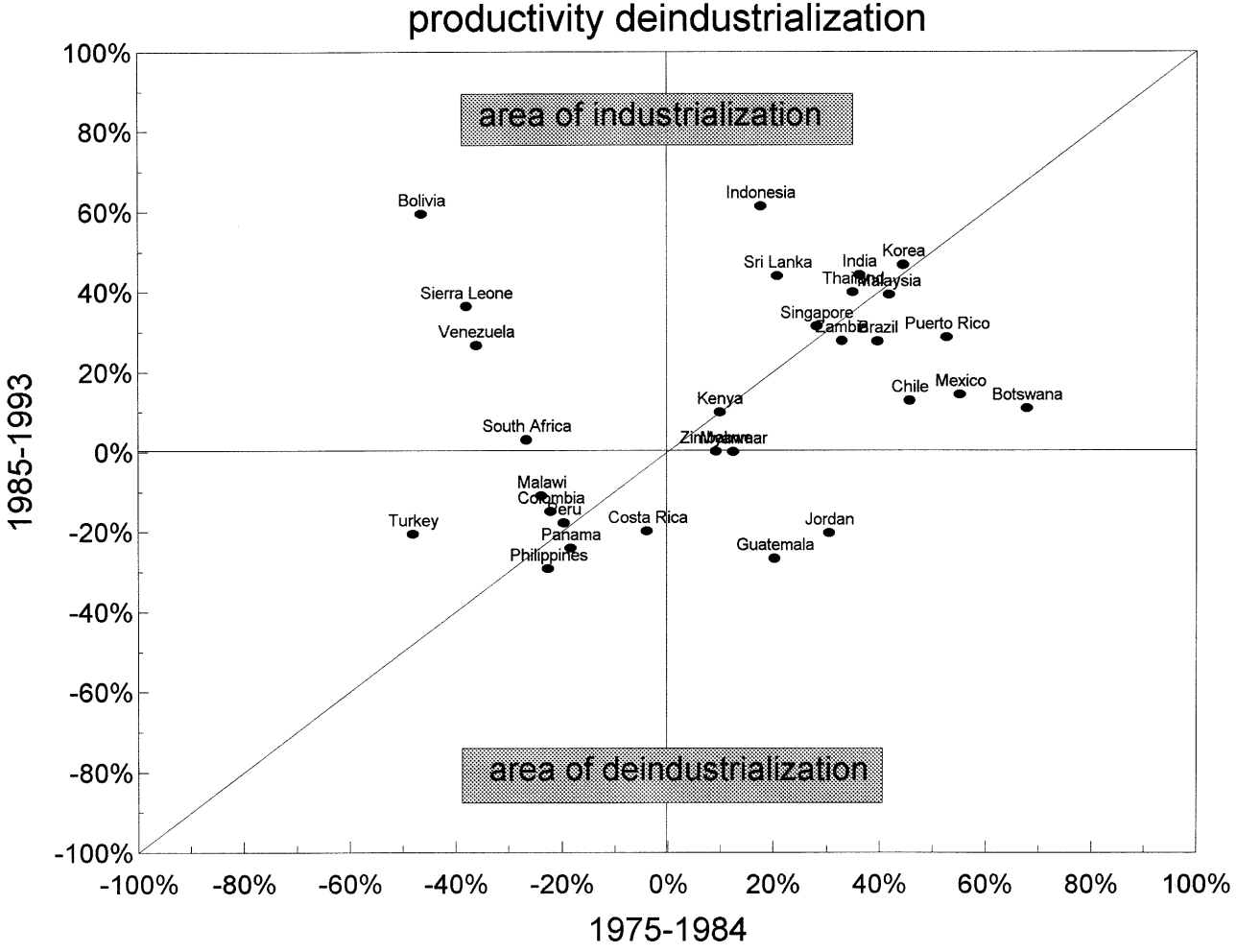
Brazilian employment data until 1989 from ILO, thereafter from RAIS, Brazil; the two series are not strictly comparable.

~The coefficient of variation is defined as standard deviation divided by the mean.

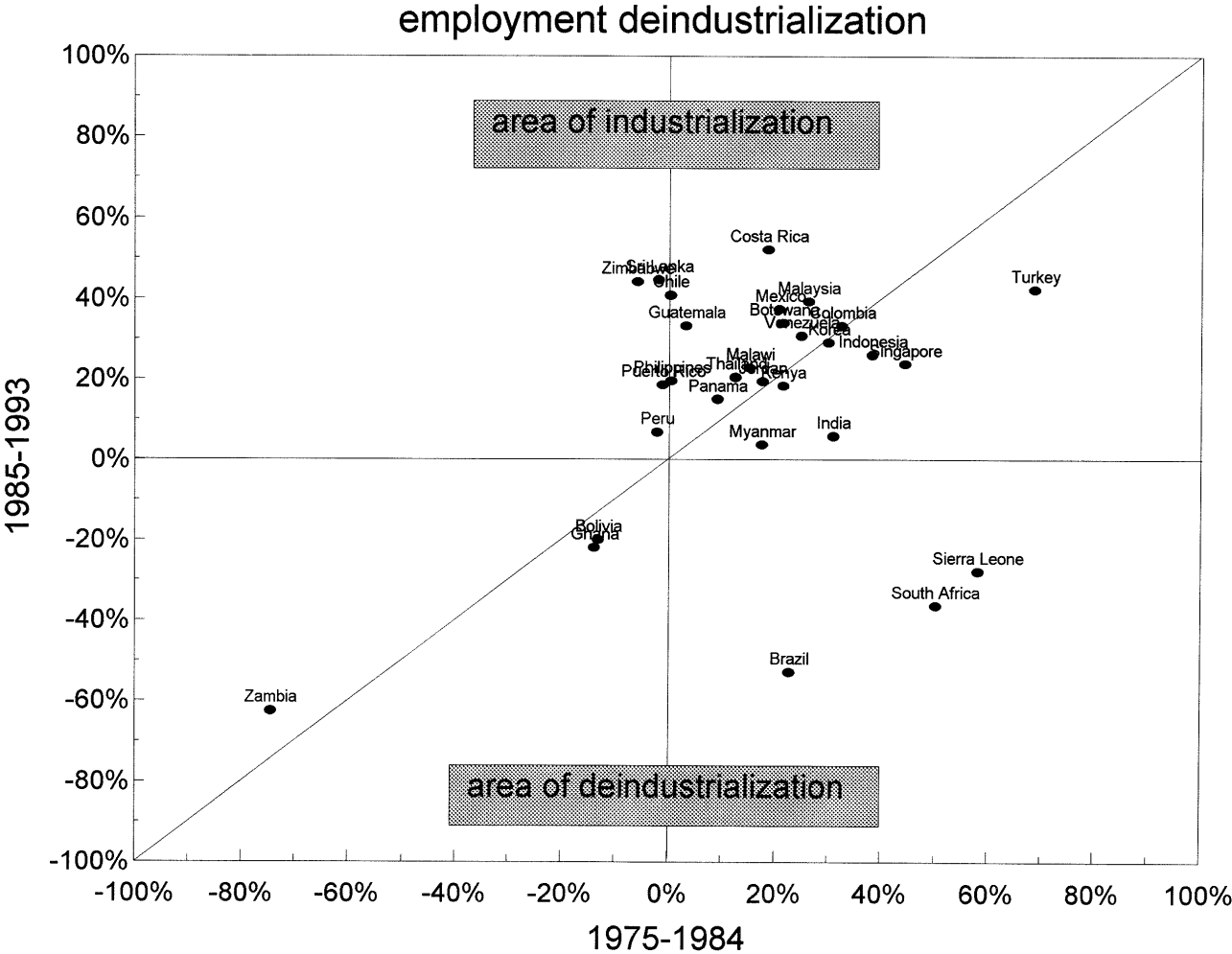
^Frequency distribution for output growth in brackets according to sample's wider range. The figures in brackets represent regional frequency distributions (sub-Saharan Africa, Latin America, Asia); when the sum of individual intervals diverges from the sum in brackets then it includes either Jordan, Turkey or both.

Source: Author's calculations.

Graph 1: Industrial sector contribution to overall productivity change (in percent)



Graph 2: Industrial sector contribution to overall employment change (in percent)



Graph 3: Industrial sector contribution to overall output change (in percent)

