8. Employment elasticities indicator (KILM 19)

KILM 19. Employment elasticities

Introduction

Employment elasticities provide a numerical measure of how employment growth varies with growth in economic output. Though discussed less frequently than other key labour market indicators, employment elasticities can provide important information about labour markets. In their most basic use, they serve as a useful way to examine how growth in economic output and growth in employment evolve together over time. They can also provide insight into trends in labour productivity and employment generation for different population subsets in a country, and assist in detecting and analysing structural changes in employment over time.

KILM 19 includes six types of employment elasticities, corresponding with three demographic groups (females, males and the total employed population), and the employed population in the three economic sectors (agriculture, industry and services). The total employment elasticity shows how total employment in a country has varied with total economic output. An elasticity of 1 implies that every 1 percentage point of GDP growth is associated with a 1 percentage point increase in employment. An elasticity of 0.4 implies that every 1 percentage point of GDP growth is associated with employment growth of 0.4 percentage points, and so forth. The female and male employment elasticities show how employment among women and men in a given country has varied with total economic output. These three elasticities are presented for three time periods, 1993 to 1997, 1997 to 2001 and 2001 to 2005 in table 19a. The three sector employment elasticities indicate how employment in a given economic sector has varied with value added in the same sector. The data on sector employment elasticities in table 19b are given for one time period, 1993 to 2005.

Use of the indicator

When it comes to employment elasticities, there is no universally accepted "ideal" figure to which countries' historical elasticities should be compared. The degree of "employment intensity" required by a country depends on several variables including the country's rate of economic growth, the amount of surplus labour and labour force growth rate, the unemployment and labour force participation rates, the level and growth rate of labour productivity, and the poverty rate (especially among workers). All else being equal, countries with relatively high economic growth rates do not require an employment elasticity that is as high as those in countries experiencing lower rates of economic growth. Countries with high labour force growth – or with large reserves of workers – require higher employment elasticities. Given that the extreme poor often rely exclusively on their own labour for survival, countries with large numbers of impoverished workers may need to achieve relatively higher employment elasticities than less labour-abundant, more developed economies, in order to provide sufficient employment opportunities for the working poor. To this end, developing economies often require higher employment elasticities for a given rate of economic growth than developed economies, as the former tend to have a surplus of labour. Accordingly, employment elasticities tend to gradually fall as a country becomes more developed and more labour scarce.

When GDP and employment for a given elasticity are measured for the same group (e.g. total output and total employment, or agriculture value added and employment in agriculture), employment elasticities provide information regarding trends in employment *and* labour productivity. Box 19b shows that globally, the world's aggregate employment elasticity was between 0.32 and 0.33 during

the three time periods between 1993 and 2005. This implies that for every 1 percentage point of additional GDP growth, total employment has grown between 0.32 and 0.33 percentage points during the three periods between 1993 and 2005. Because changes in

Box 19a. Interpreting employment elasticities [1]

		GDP growth	
		Positive GDP growth	**Negative GDP growth**
Employment elasticity (ε)	**ε < 0**	(-) employment growth (+) productivity growth	(+) employment growth (-) productivity growth
	0 ≤ ε ≤ 1	(+) employment growth (+) productivity growth	(-) employment growth (-) productivity growth
	ε > 1	(+) employment growth (-) productivity growth	(-) employment growth (+) productivity growth

- The upper-left box shows that in countries with positive GDP growth, negative employment elasticities (represented as "□") correspond with negative employment growth and positive productivity growth. For instance, in an economy growing at 2 per cent per annum with an employment elasticity of -0.2, the average rate of employment growth is approximately -0.4 per cent, while the average rate of productivity growth is 2.4 per cent.

- The middle-left box shows that in countries with positive GDP growth, employment elasticities between 0 and 1 correspond with positive employment and productivity growth, but the higher the elasticities within this range, the more employment-intensive (lower productivity) is growth. Hence, an economy growing at 2 per cent per annum with an employment elasticity of 0.6 is experiencing average annual employment growth of about 1.2 per cent and average annual productivity growth of 0.8 per cent. This box typically represents the ideal growth-employment-productivity balance, whereby job growth is occurring hand-in-hand with gains in productivity.[2]

- The lower-left box shows that in countries with positive GDP growth, elasticities greater than 1 correspond with positive employment growth and negative productivity growth.

- The three boxes in the right column indicate that the interpretation of employment elasticities vis-à-vis employment growth and productivity growth is exactly the opposite in cases in which the corresponding GDP growth rate is negative.

[1] This table corresponds to interpretations that can be made when output exactly corresponds with employment (e.g. total output and total employment, or agriculture value added and employment in agriculture). The relationships between productivity, employment and output may not hold in cases in which employment corresponds to a population sub-group (i.e. women or men) and where total output is used instead of output for the population sub-group.

[2] A ILO study by Kahn (2001) claimed that employment elasticities in developing economies should ideally be around 0.7 until these economies attain upper-middle-income status. Kahn demonstrated that employment elasticities gradually fall as a country becomes more developed and more labour scarce. Labour-abundant economies, he argued, and especially those with relatively high incidences of poverty, need to achieve relatively higher employment intensity than do less labour-abundant economies. See A. Kahn: "Employment policies for poverty reduction", Recovery and Reconstruction Department (Geneva, ILO, 2001).

GDP growth are equal to the sum of changes in employment growth and changes in labour productivity growth, one can also conclude from this global employment elasticity that around two-thirds of the world's economic growth between 1993 and 2005 can be attributed to gains in productivity, while around one-third resulted from increased employment.

Box 19a summarizes the inferences that can be drawn from examining employment elasticities and GDP growth rates together.

Several issues related to the use of employment elasticities as an analytical tool should be borne in mind before attempting to draw inferences from them regarding employment performance. First, employment elasticities only take into account information pertaining to historical employment and output growth. This past relationship may not be a good predictor of future trends. Furthermore, elasticities do not provide information as to how other variables influence employment or overall economic performance. As a result, taken alone, employment elasticities are likely to give an over-simplified view of the relationship between output and employment growth. The results should thus be interpreted as evidence of correlation rather than of causality.

Second, employment elasticities within a given country or even at the regional level can display a large degree of volatility from one period to the next. Volatility in the estimates has several potential sources including real changes in the relationship between employment growth and output growth, changes in only one of these two variables, or mere statistical "noise". The first case is not worrisome, as it is indicative of real changes in the underlying relationship between the variables under examination. The second case applies especially in situations where output growth is very small. Indeed, countries with GDP growth close to zero may exhibit large swings in employment elasticities arising from relatively small changes in the underlying variables. It is therefore important to keep the country's or region's relative GDP performance in mind when interpreting elasticities. The third case arises mainly due to small sample size issues. Because the elasticities calculated for the KILM are for relatively short time periods, the fairly small number of observations for each period in each country can result in statistical "noise" and thus in a lower degree of certainty in the elasticity estimates themselves. It is therefore important to stress that the individual country-level elasticities do have a degree of statistical uncertainty.

Lastly, there is a danger in terms of assuming that seemingly favourable trends in employment intensity are indicative of positive overall macroeconomic performance in a given country or region. While it is indeed crucial to get the employment-side of the macroeconomic picture right, success in this regard by no means automatically translates into other favourable outcomes, such as poverty alleviation. It is therefore important to assess trends in employment elasticities together with other important macroeconomic variables, such as trends in output growth, inequality, real wages, poverty rates, and others.

Definitions and sources

The employment elasticity is defined as the average percentage point change in employment for a given employed population group (total, female, male, agriculture, industry or services) associated with a 1 percentage point change in output (represented by total output or value added in a given sector) over a selected period.

The underlying country-level employment data for the total, female and male elasticities shown in table 19a are taken from the Global Employment Trends (GET) Model,1 which combines unemployment data from KILM tables 8 and 9 together with

1. For more information on the Global Employment Trends Model, see box 3 in "Guide to understanding the KILM".

Box 19b. World and regional estimates of employment elasticities [1]

	Employment elasticities			Average annual GDP growth rates		
Employment elasticities	1991-1995	1995-1999	1999-2003	1991-1995	1995-1999	1999-2003
WORLD	0.34	0.38	0.30	2.9	3.6	3.5
Developed Economies and European Union	0.25	0.34	0.21	2.2	3.1	2.1
Central and Eastern Europe (non-EU) and CIS	0.28	0.21	0.10	-7.8	0.5	6.2
East Asia	0.14	0.14	0.18	11.6	7.4	7.7
South-East Asia and the Pacific	0.39	0.20	0.42	7.4	1.6	4.8
South Asia	0.40	0.49	0.36	6.0	5.8	5.1
Latin America and the Caribbean	0.64	0.68	0.41	3.4	2.8	1.4
Middle East and North Africa	0.66	1.01	0.70	3.1	3.7	4.3
Sub-Saharan Africa	0.73	0.82	0.53	1.1	3.2	3.2

Source: ILO Global Employment Trends Model. See box 3 in "A Guide to Understanding the KILM" for more information on estimation methodology.

The table above reveals that for every 1 percentage point of additional GDP growth, total global employment grew between 0.30 and 0.38 percentage points during the three periods between 1991 and 2003. This implies that around two-thirds of the economic growth realized between 1991 and 2003 can be attributed to gains in productivity, while one-third resulted from employment growth. Of the three periods, employment growth was strongest from 1995 to 1999, which was also the period with the strongest global economic growth. Significantly, during the most recent period there was a slight decline in the rate of GDP growth coupled with a marked reduction in the employment intensity of growth.

In the Developed Economies and European Union region, total employment elasticities ranged between 0.21 and 0.34. The most employment-intensive and the most rapid growth period was between 1995 and 1999, while the least employment-intensive growth occurred in the latest period, 1999 to 2003. It is clear that countries in the Central and Eastern Europe (non-EU) and CIS region underwent substantial labour market and macroeconomic adjustments between 1991 and 2003. Between 1991 and 1995, the region experienced a tremendous decline in economic growth together with falling employment and declining labour productivity. The second period from 1995 to 1999 saw a marginal increase in growth together with a slight recovery in employment and productivity. The most recent period has witnessed a large rebound in growth and an employment elasticity of 0.10, indicating that growth has resulted mainly from labour productivity growth rather than employment growth. Latin America and the Caribbean achieved modest to moderate rates of economic growth from 1991 to 2003. One result in Latin America and the Caribbean that was similar to the world as a whole was that the region experienced a decline in the employment intensity of growth between 1999 and 2003, which coincided with a decline in output growth.

In East Asia, total employment elasticities have remained quite low in comparison with the global figures. Combined with high GDP growth rates, this implies that the region has experienced robust productivity growth. However, unemployment rates (see box 8a) in the region have remained fairly steady. Consequently, the region's growth has been sufficiently employment-intensive, while allowing for rapid increases in living standards through productivity growth. South-East Asia experienced a large degree of volatility in overall economic and employment performance over the three periods. From 1991 to 1995, the region's output grew by over 7.4 per cent and the overall employment elasticity of 0.39 was high enough to translate into a reduction in total unemployment. In the period corresponding with the Asian financial crisis, the region's overall employment elasticity fell, indicating that the reduction in output was met with a greater relative decline in employment growth than in productivity growth. The most recent period has witnessed a substantial increase in employment intensity in the region, coupled with a more moderate rise in output. Taking South Asia's total employment elasticities, which ranged from 0.36 to 0.49, together with the region's rapid output growth, gives a clear picture of very favourable labour market developments in the region since 1991, with fast labour productivity growth and substantial growth in employment.

Box 19b (continued)

The most employment-intensive growth was registered in the Middle East and North Africa and sub-Saharan Africa. Taking this together with the regions' relatively low output growth reveals that labour productivity growth has remained extremely low. One encouraging sign is that, in both regions, the fastest growth in output and the most balanced growth – as reflected in the regions' employment elasticities – occurred in the most recent period. Thus, there is reason to hope that gains in output, employment and labour productivity will lead to poverty reduction.

Sectoral employment elasticities and average annual value-added growth rates	Agriculture		Industry		Services	
	Elasticity	Value-added growth	Elasticity	Value-added growth	Elasticity	Value-added growth
WORLD	0.41	2.0	0.28	2.1	0.57	3.0
Developed Economies and European Union	-0.43	1.2	0.28	1.3	0.56	2.9
Central and Eastern Europe (non-EU) and CIS	-0.24	-0.1	0.29	-0.4	0.25	1.5
East Asia	0.23	3.7	0.06	12.5	0.50	8.8
South-East Asia and the Pacific	0.20	2.1	0.68	5.4	0.99	4.6
South Asia	0.71	2.9	0.37	5.9	0.36	6.9
Latin America and the Caribbean	-0.32	2.5	0.51	2.2	1.04	2.7
Middle East and North Africa	1.06	3.3	0.35	2.0	0.73	4.4
Sub-Saharan Africa	0.82	2.3	0.90	2.0	0.79	2.8

The final table provides a picture of historical sectoral employment elasticities and value-added growth by economic sector between 1991 and 2003. These two figures taken together can be useful indicators for measuring broad historical structural economic changes. Globally, the services sector was both the fastest growing sector and the sector with the most job-intensive growth. Indeed, for every 1 percentage point of growth in services sector value added, employment increased by 0.57 percentage points (while the corresponding growth in productivity was 0.43 percentage points). On the other hand, in the agriculture sector, and especially in the industrial sector, value-added growth has been driven more by gains in productivity than by gains in employment.

Regions experiencing structural economic change away from agriculture and into services (and,to a lesser extent, industry) include the Developed Economies and European Union and Latin America and the Caribbean, as each experienced a decline in employment in agriculture despite positive growth in agriculture value added. On the other hand, the Middle East and North Africa experienced greater growth in employment in agriculture than in value added growth in the sector, which meant that the region's agricultural labour productivity declined. It is clear that the agriculture sector also continues to be an important source of livelihood in sub-Saharan Africa and South Asia.

1 See Chapter 1, section A, for additional discussion of employment elasticitites with subregional comparisons.

labour force data from table 1. The employment by sector data utilized to calculate the sector employment elasticities in table 19b are taken from KILM table 4. For the calculation of employment elasticities, only employment data generated from household labour force surveys or population censuses are utilized.

All national GDP and sector value added figures used in the construction of this series are expressed in constant 2000 US dollars. These figures come from the World Bank's *World Development Indicators* database.

Limitations to comparability

Comparability of employment elasticities across countries is affected most significantly by differences in the definitions used for the employment figures. For this indicator, the

employed population is defined as persons aged 15 years and older who satisfy the official ILO definition of employed, as set out in the 13th International Conference of Labour Statisticians (ICLS) and described in the manuscript for KILM 2.[2] Some countries use a lower age bound than 15 years, while some others have an upper limit for eligibility, such as 65, 70 or 74 years. The variations on age bands can affect the comparability of employment estimates across countries, although not to a significant degree.

Two sources of potential comparability limitations are eliminated in the two elasticities tables. First, because employment data are only used if they come from labour force surveys or population censuses, measurement variances are likely to be smaller than if other sources were used as well, for example, administrative records. Second, the main criterion for inclusion of employment data into KILM 19 is that the underlying employment figure is representative of the entire country, thus eliminating comparability issues stemming from geographic limitations (e.g. coverage of urban areas only).

Trends

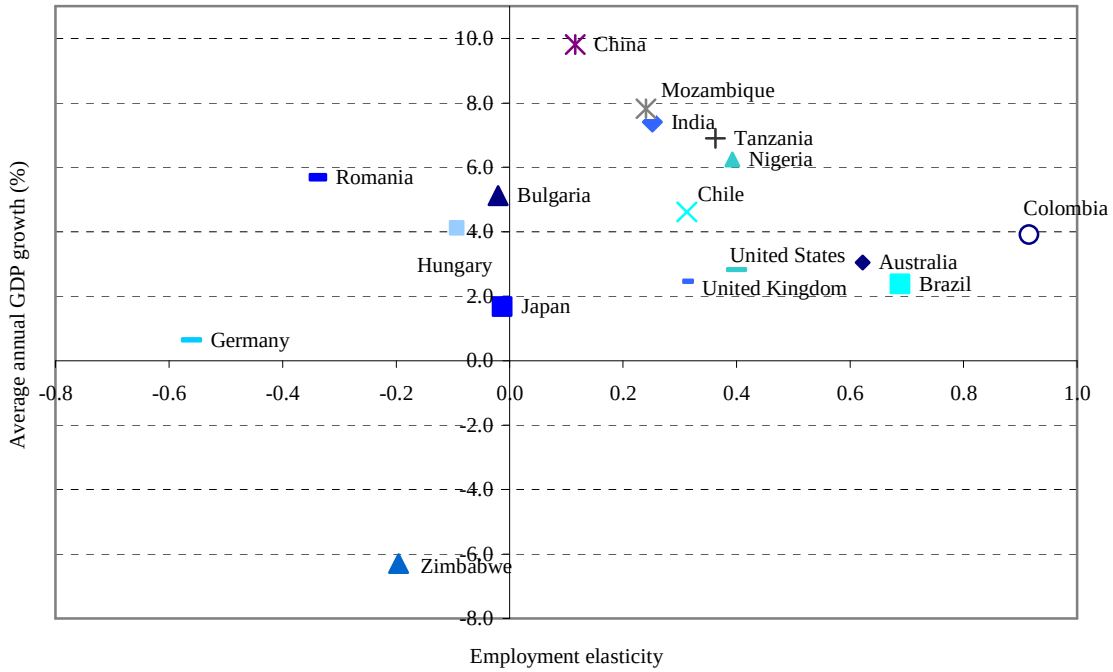
Figure 19a shows the wide variation in employment elasticities among countries. China, with its very high rate of economic growth, experienced relatively low employment elasticities, reflecting the country's robust labour productivity growth. India also grew fairly rapidly between 2001 and 2005, but, owing primarily to its rapid labour force growth, it requires a higher employment elasticity than China in order to avoid increasing unemployment. Many developed economies such as Australia, the United Kingdom and the United States had employment elasticities between 0 and 0.7. The two latest new EU Member States, Bulgaria and Romania, experienced negative employment elasticities over the period from 2001 to 2005. The same was true for Hungary, Japan and even more so for Germany. The negative elasticities, together with positive rates of economic growth in these countries, indicate that employment decreased over the period while labour productivity grew faster than overall GDP. Brazil and Colombia's relatively high employment elasticities and low GDP growth indicate that these countries did not experience robust growth in labour productivity between 2001 and 2005, whereas in Chile, higher GDP growth was shared more equally between employment growth and labour productivity growth. Great differences exist between countries in sub-Saharan Africa, yet Mozambique, Nigeria and the United Republic of Tanzania each experienced relatively robust GDP growth, together with both employment and productivity gains between 2001 and 2005.

Figures 19b through 19d depict trends in the employment intensity of growth in each of the three economic sectors (agriculture, industry and services) together with trends in value-added growth in the respective sectors. The placement on the vertical axis shows a given country's sector employment elasticity (the average percentage point change in employment in the sector over the period of 1993-2005 given a 1 percentage point change in value-added growth in the sector). The horizontal axis shows the average annual growth rate in value added in the sector.

Readers should notice the greater dispersion in agriculture employment elasticities relative to the employment elasticities in industry and services. This, together with the comparatively large number of countries in the lower quadrants in figure 19b, graphically depicts the structural economic change that is taking place in many developing countries, as they experienced growth in agriculture value added but also an overall decline in employment in agriculture.

2 Resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the 13th International Conference of Labour Statisticians, Geneva, 1982; website: http://www.ilo.org/public/english/bureau/stat/download/res/ecacpop.htm.

Figure 19a. Employment elasticities and GDP growth rates, selected countries, 2001-2005



Also many of the countries that faced this combination of effects (shown in the lower quadrants) were in the Developed Economies & European Union, where less and less people work in agriculture while technical progress increases productivity in the sector. It is also important to note, however, that there were still a significant number of countries, particularly from developing regions, which fell in the upper-right quadrant in figure 19b, whereby both output and employment grew in agriculture. This emphasizes the fact that for many countries in developing regions, such as North Africa, sub-Saharan Africa, South-East Asia, South Asia and the Middle East the agriculture sector continues to be an important sector in terms of employment. There are, of course, exceptions: Equatorial Guinea and South Africa, for example, saw significant decreases in both employment and output in agriculture over the period.

Figure 19c shows that a large number of countries in the Central and Eastern Europe (non-EU) & CIS region are now in the upper-right quadrant. In the early years of the transition from the Communist system, most of them were found in the upper-left quadrant. This move was caused by the positive development in both output and employment in the region recovering from the disintegration of the former Soviet Union, which had a particularly strong negative impact on the region's industrial base in the early 1990s. The vast majority of countries in the other regions are also found in the upper-right quadrant, whereby industrial output and employment grew hand-in-hand. In contrast, some countries – a few in the Developed Economies & European Union and Latin America & the Caribbean – had negative employment elasticities combined with negative changes in value added, which can be explained partially by outsourcing and increased cost pressure in the industrial sector as a result of globalization.

The relationship between employment elasticities and value-added growth in the services sector, which is shown in figure 19d, underscores the dynamism of this sector in many countries. In many parts of the world,

the services sector grew rapidly while creating employment opportunities at the same time.

Figure 19b. Agriculture employment elasticities and agriculture value-added growth rates, 1993-2005

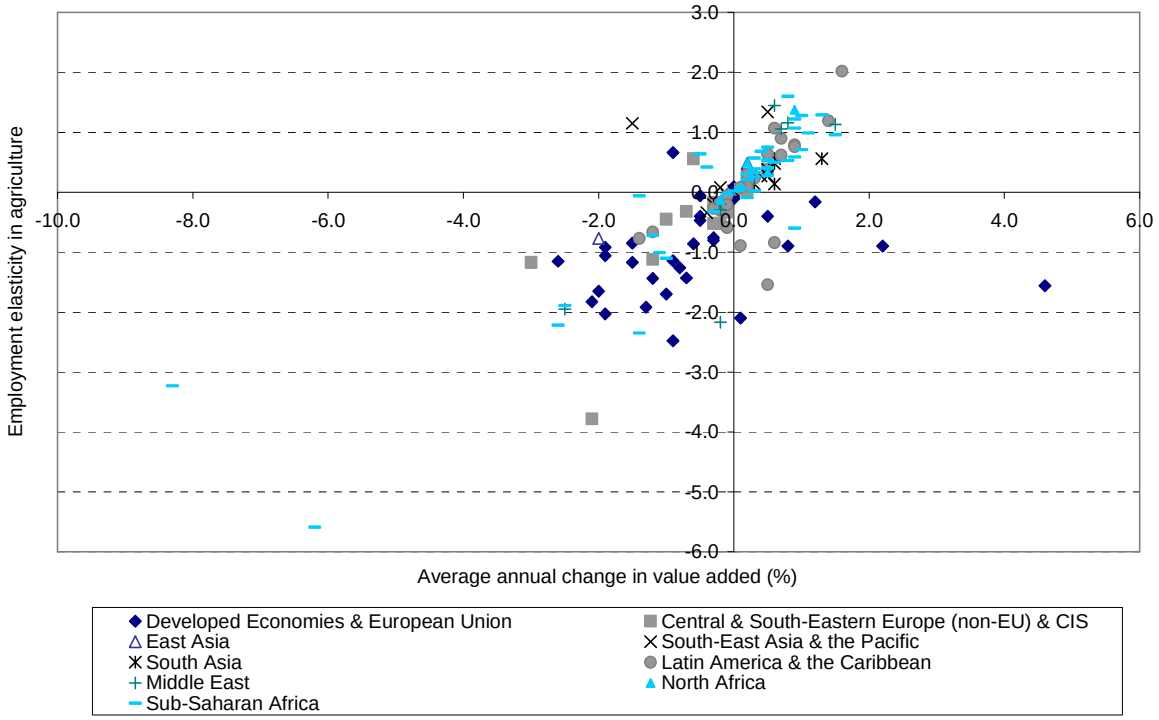


Figure 19c. Industry employment elasticities and agriculture value-added growth rates, 1993-2005

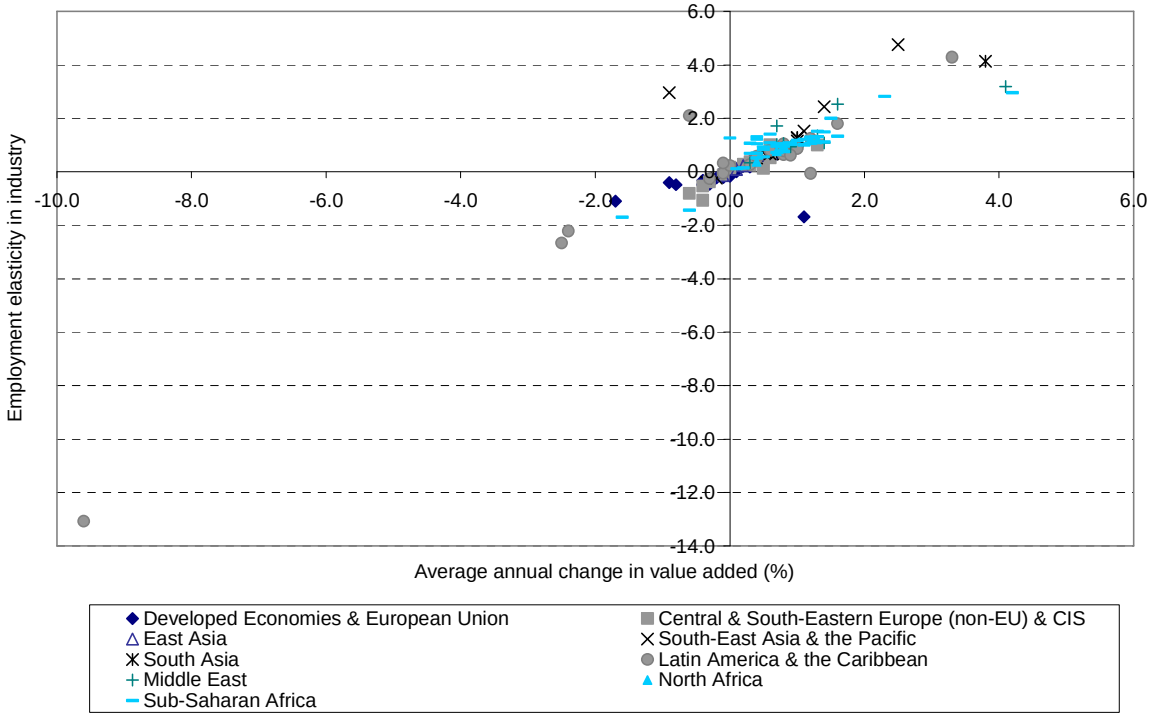


Figure 19d. Services employment elasticities and services value-added growth rates, 1993-2005