BIS WORKING PAPERS
No. 16 - February 1991

LABOUR MARKET DEVELOPMENTS IN DEVELOPING COUNTRIES

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Introduction

Developments in the world economy in the 1980s have not been kind to the less developed countries (LDCs). The second oil shock in 1978-80 followed by falling non-oil commodity prices implied large and enduring terms-of-trade losses in non-oil exporting LDCs. After the outbreak of the debt crisis in 1982, many countries were forced to curtail domestic demand growth to reduce trade deficits and meet higher interest payments. As a result, per capita real GDP growth of the LDCs has averaged only around 1% in the 1980s (compared with 2¼% in the 1970s); in both Africa and Latin America real per capita GDP was actually lower in 1989 than in 1980.

While the extent of the fall in output growth as well as its major causes are generally well-known, less is known about the response of labour markets in the LDCs to the weaker output trends. It is likely, however, that real wage flexibility, so important for labour market adjustment in the industrial world, has been even more necessary for LDCs. Firstly, the output shocks have been much larger, thus increasing the need for real wage moderation to soften the adverse employment effects of lower demand. Secondly, the LDCs have been exposed to more severe terms-of-trade deteriorations so that the real income losses to be absorbed by labour and capital were much larger than in the industrialised countries. Thirdly, most stabilisation packages have included large exchange rate depreciations which - to ensure corresponding real depreciations and improvements in the competitive position of the tradable sectors - have required not only a

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* I am indebted to Dr. Bockelmann, Dr. Hutchison and Dr. Turner for many helpful comments on an earlier version of this paper which was presented at the AEA Conference on Modelling the Labour Market, Strasbourg, 5th-7th December, 1990. I also wish to thank Mr. Arthur for the graphical work and Miss Duffy for expert typing.

high degree of aggregate real wage moderation but also flexible wage structures.[1]

As in industrialised countries various labour market regulations (such as minimum wages, indexation, employment-protecting measures and non-wage labour costs (NWLCs) related to social security taxes) are likely to have made real wages more rigid. Trade unions may have further reduced real wage flexibility, limited labour mobility and frozen wage structures, thus causing a segmentation of labour markets. The latter is a particular problem for LDCs as it inhibits the adjustment of real exchange rates and the reallocation of resources from the non-tradable to the tradable sectors. For instance, if employees in the tradable sectors are more aggressive than those in the non-tradable sectors, a nominal exchange rate depreciations will mainly widen wage differentials but result in only a small real devaluation. Moreover, if mobility is low the relative price shifts actually achieved will have only a small influence on resource allocation.

Analysing these important questions and issues is, however, difficult. In the first place, identifying the effects of rigid wage structures and segmentation requires a microeconomic approach which neither data availability nor the scope of this paper permits. Secondly, even the analysis of aggregate real wages is difficult as data on employment, unemployment and wages are available for only a few countries and may even then be published infrequently and with long lags. Thirdly, such data as do exist give only a partial picture due to the heterogeneous and segmented nature of labour markets. Typically, the labour market in a developing

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1 The size of the real wage elasticity of the aggregate labour demand function together with the actual degree of real wage flexibility is also relevant in assessing movements in the functional income distribution, whereas the flexibility of wage structures and wage differentials mainly affects the personal income distribution. For reasons of space the distribution between capital and labour will be considered only briefly in this paper and the personal income distribution not at all. It might be mentioned, though, that there is some evidence for Latin America that households in the lower income brackets have borne a disproportionately large share of the adjustment burden and that some analysts have seen this as posing a risk to the acceptability and sustainability of the stabilisation policies pursued.

country consists of three distinct sectors:[2] (i) a rural sector with a large share of self-employed persons and unpaid family workers; (ii) an "informal" urban sector characterised by small privately owned enterprises producing mainly services and other non-tradables and relying (in addition to their own input) on paid labour without any formal wage and employment contract; and (iii) a "formal" urban sector consisting of large enterprises which hire employees - both skilled and unskilled - according to formal contracts and which are subject to various labour regulations.[3] Many enterprises in the formal sector are nationalised and tend to be heavily protected against foreign competition, while on the employee side a large proportion of the labour force may be unionised. As a result of this segmentation, the proportion of wage earners in total employment tends to be much lower than in industrial countries, though there are large variations across countries and regions. Moreover, a characteristic feature of family-based enterprises in the informal and rural sectors is that consumption and production decisions are integrated, so that labour market models for industrial countries (where the proportion of wage earners is high) have only limited application.[4]

Another problem is that published measures of unemployment mostly include only unemployed workers looking for jobs in the formal sector, but not underemployed workers in the informal and rural sectors. The effective degree of labour market slack may thus be understated. Also, in periods of weak demand growth the proportion of part-time workers rises and some workers laid off in the formal sector find employment in the informal sector where labour productivity tends to be lower. Hence labour market slack can appear as a fall in average productivity rather than as a rise in open unemployment. Finally, open unemployment may show a rising trend despite strong and positive employment growth as industrialisation combined with migration from rural to urban sectors frequently means that previously

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2 See Johnson (1986) and Rosenzweig (1988).

3 The formal sector is not entirely confined to urban areas. In Kenya, for instance, formal sector wage earners are equally divided between rural and urban areas (Fallon and Riveros (1989)).

4 See Rosenzweig (1988). Hossain (1990), however, successfully applies a traditional labour market model to the determination of agricultural real wages in Bangladesh.

underemployed workers are registered as openly unemployed while they are looking for industrial jobs. Trade liberalisation and other deregulation measures may have a similar effect if wage differentials do not respond to increased competition (see Edwards (1988)).

Part I provides a broad description of labour market developments in selected LDCs, relying on several direct and indirect indicators, and then present a rudimentary quantitative analysis of the determinants of labour demand. Part II looks more specifically at developments in Taiwan and South Korea, for which data are more readily available. These countries are, of course, no longer representative of labour market changes in LDCs and this part mainly serves two purposes: (i) evaluating the role of labour markets and employee wage behaviour in supporting a rapid and export-oriented growth process, and (ii) highlighting some major differences between the two countries, especially with respect to employee wage behaviour. Part III summarises the empirical results and derives a few policy implications, while Annex A provides a more detailed discussion of the model used for Taiwan and South Korea and Annex B is a graphical presentation of labour market developments in manufacturing.

Part I. Labour market developments: General discussion.

A. Structures and recent developments.

Table 1 presents some basic indicators based on the latest labour or population surveys. As can be seen, agriculture still accounts for a large share of total employment, especially in countries with low per capita GDP. The share is high in Sub-Saharan Africa and in most Asian countries, whereas in several Latin American countries the services sector (reflecting in many cases a large public sector) accounts for 50% of total employment. Indeed, an important feature of sectoral employment shifts in many LDCs is that the tertiary sector absorbs a much higher proportion of the outflow from rural areas than previously observed for industrial countries. This has been particularly noticeable in Latin America (see IADB (1987)) and may be ascribed to three factors: (i) because of technical progress, the labour intensity of industry is much lower than when

Table 1

Basic labour market indicators: Selected countries

Region	Country	Per capita GDP in US$, 1988	Distribution of labour force by:[1] Sector and Occupation							Latest year
			Agriculture	Industry[2]	Services[3]	Unemployed[4]	Self-employed	Employees	Family workers[3]	
Africa	Algeria	2,360	25.7	32.6	41.7	-	-	-	-	1985
	Burundi	240	92.9	2.2	4.7	0.2	35.6	5.6	58.6	1979
	Cameroon	1,010	74.0	6.3	13.9	5.8	-	-	-	1985
	Egypt	660	38.2	18.8	37.4	5.6	26.5	50.7	17.1	1984
	Ghana	400	59.3	12.5	25.4	2.8	67.7	15.7	13.8	1984
	Mauritius	1,810	18.5	39.9	41.6	-	-	-	-	1987
	Sudan	480	64.9	7.0	27.5	0.6	58.0	26.1	15.3	1973
	Tunisia	1,230	23.4	34.8	29.7	12.1	22.5	57.5	7.6	1984
	Zambia	290	37.9	9.8	24.8	27.5	22.9	42.5	7.1	1980
Latin America	Brazil	2,160	25.2	23.6	48.8	2.4	25.7	64.5	7.4	1986
	Colombia	1,180	34.3	23.5	42.2	-	-	-	-	1980
	Chile	1,510	19.4	21.6	57.2	1.8	23.7	63.7	10.8	1986
	Guatemala	900	49.8	16.2	32.9	1.1	30.9	47.2	20.8	1987
	Mexico	1,760	25.8	20.5	52.7	0.6	27.0	44.3	28.1	1987
	Peru	1,300	35.1	16.4	43.3	5.2	41.2	42.2	11.4	1981
	Uruguay	2,470	15.3	25.1	42.0	1.6	22.7	70.6	5.1	1985
	Venezuela	3,250	13.6	28.4	57.0	1.0	26.0	62.7	10.3	1987
Asia	Bangladesh	170	56.6	12.6	30.8	-	39.2	40.0	20.8	1985
	China	330	73.7	16.0	10.3	-	-	-	-	1982
	India	340	62.6	12.7	24.7	-	9.3	17.4	73.3	1981
	Indonesia	440	53.5	13.1	31.3	2.1	45.1	29.5	23.3	1985
	Pakistan	350	51.1	13.9	31.9	3.1	56.2	26.5	14.2	1981
	Philippines	630	43.4	13.4	34.1	9.1	35.8	40.2	14.9	1987
	South Korea	3,600	21.2	33.0	42.7	3.1	29.6	54.4	12.9	1987
	Taiwan	6,177	21.7	34.7	42.0	1.6	20.9	67.5	10.0	1988
	Thailand	1,000	72.4	7.8	19.8	-	-	-	-	1980
Memo Item:	Industrial countries	16,920	7.3	27.9	57.9	6.9	11.3	72.0	9.8	1988

Sources: OECD: National accounts and Labour Force Statistics; World Bank, World Development Report; ILO, Yearbook of Labour Statistics; Statistical Yearbook for Latin America and the Caribbean and Statistical Yearbook of the Republic of China.

[1] As a percentage of total labour force. [2] Mining, manufacturing and construction. [3] Including persons not classified elsewhere. [4] Only includes persons without previous work experience, except for Indonesia, Peru, the Philippines, South Korea, Taiwan, Zambia and the industrial countries.

developed countries started to industrialise;[5] (ii) the industrial sector has been hit harder by the crisis of the 1980s than services; and (iii) overvalued exchange rates have favoured the services sector at the expense of industries producing tradables, a bias made worse by rapid public sector growth.

The sectoral and occupational distributions of the labour force are closely related, as countries with large rural sectors also tend to have a large proportion of self-employed persons and unpaid family workers, while in more urbanised Latin America as well as in Taiwan and South Korea the proportion of wage earners rises to 50% or more. In virtually all countries the proportion of self-employed is much higher than in industrial countries,[6] reflecting not only the relatively larger rural sector but also the many small enterprises in the informal urban sector.

Table 2 compares output developments for different periods with underlying trends in labour force growth, using activity and unemployment rates as complementary measures of slack. In most of the African countries GDP growth in the 1980s fell near to or below the growth in the labour force and this has been reflected in rising unemployment or falling activity rates.[7] There are, however, exceptions to this general trend as well as differences between countries with regard to underlying output employment relations. Mauritius, applying export-oriented policies, has boosted output growth in the 1980s and reduced unemployment, whereas Egypt and Cameroon, despite relatively steep growth trends, have seen worsening labour market conditions. A typical feature in both countries (and this

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5 In some countries, this effect has been reinforced by policies promoting capital-intensive industries.

6 One exception is India. However, 95% of the agricultural labour force is not classified by occupation.

7 Long-run unemployment and activity rates mainly reflect changes in labour demand relative population growth. In the short run, two additional factors can play a role: a "discouraged worker effect" as workers faced with poor employment prospects leave the labour force; and an "added worker effect" as a result of "secondary" workers joining the labour force when "primary" workers lose their jobs and family incomes decline. For instance, in Argentina the former effect dominated up to around 1985 whereas since then an added worker effect has contributed to the rise in unemployment (see Riveros and Sanchez (1988)).

Table 2

Developments in output, labour force and unemployment: Selected countries

Region	Country	Real GDP			Labour force		Activity rate[1]		Rate of unemployment[2]				
		1965-73	1973-80	1980-89	1965-80	1980-85	1970s	1980s	1970	1980	1982-83	1985-86	1989
		Percentage change, annual average					In percentages						
Africa	Algeria	7.0	6.6	3.4	2.2	3.6	21.6	22.6	-	-	-	-	-
	Burundi	4.8	3.7	4.0	1.2	2.0	57.0	52.9	-	-	-	-	-
	Cameroon	2.4	8.9	7.0	1.7	1.8	44.1	39.1	-	-	-	-	-
	Egypt	2.8	9.1	6.3	2.2	2.6	27.7	27.6	2.4	5.2	6.2	6.0	7.0
	Ghana	3.4	-0.3	2.4	1.9	2.7	38.9	35.8	0.4	1.2	0.7	0.4	0.5[3]
	Ivory Coast	8.9	5.7	0.5	2.7	2.7	46.6	40.2	-	4.0	-	-	14.0[4]
	Kenya	8.4	5.1	3.6	3.6	3.5	43.0	39.9	-	-	-	-	16.0[5]
	Mauritius	2.4	5.2	5.7	2.6	3.3	32.3	38.0	10.0	9.3	19.5	15.0	6.5[3]
	Sudan	0.9	6.7	-1.0	2.4	2.8	33.3	32.4	-	19.4	13.2	12.6	13.1[5]
	Tunisia	7.2	6.4	3.2	2.8	3.1	28.7	32.3	4.0	3.7	3.9	3.9	4.0[3]
	Zambia	2.4	0.3	0.5	2.7	3.2	34.4	23.4	-	31.0	-	-	31.0
Latin America	Argentina	4.6	2.1	-1.5	1.1	1.1	38.0	35.3	4.8	2.6	5.0	5.5	8.0
	Bolivia	4.4	3.5	-0.7	2.0	2.7	32.0	31.2	9.0	7.1	8.3	6.4	10.2
	Brazil	9.6	6.8	2.3	3.3	2.3	34.7	36.6	6.5	6.2	6.5	4.4	3.6
	Chile	3.4	3.7	3.1	2.2	2.6	32.1	36.2	4.1	11.7	19.5	15.0	7.5
	Colombia	6.0	4.6	4.1	2.6	2.8	30.5	32.4	10.5	9.7	10.4	13.9	9.8
	Guatemala	6.1	5.5	0.8	2.3	2.8	29.5	28.5	-	2.2	8.0	13.1	7.2
	Mexico	6.9	6.2	1.3	3.9	3.2	29.8	33.8	7.0	4.5	5.4	4.3	3.0
	Peru	4.9	2.5	-0.6	2.9	2.9	30.0	31.8	4.7	7.1	7.8	7.8	7.9[3]
	Uruguay	2.4	4.4	-0.2	0.4	1.6	39.1	38.9	7.5	7.4	13.7	12.0	8.7
	Venezuela	3.7	3.3	-0.4	4.2	3.5	30.9	34.4	7.8	6.6	9.5	13.2	9.7
Asia	Bangladesh	0.0	5.7	3.5	1.9	2.8	29.4	28.8	-	-	-	12.0	12.1[5]
	China	7.8	5.4	9.8	2.4	2.5	52.0	59.6	-	4.9	2.7	1.9	2.0[6]
	India	4.0	4.1	5.9	1.7	2.0	39.2	38.9	2.0	6.4	7.8	9.9	10.6[3]
	Indonesia	8.2	7.2	4.1	2.1	2.4	37.2	38.9	0.6	0.5	0.6	1.2	1.5[6]
	Malaysia	6.9	7.5	5.2	2.5	2.9	36.2	40.4	-	4.7	4.9	7.6	8.7[6]
	Pakistan	5.5	5.4	6.6	2.6	3.2	29.4	29.9	-	3.6	3.7	3.8	3.8[5]
	Philippines	5.4	6.3	1.0	2.5	2.5	37.2	36.7	5.2	4.8	5.2	6.2	9.1[6]
	South Korea	9.6	8.9	8.7	2.8	2.7	37.0	41.3	4.5	5.2	4.2	3.9	2.6
	Taiwan	11.0	8.4	8.0	5.0	3.0	40.0	49.5	1.7	1.2	2.4	2.8	1.7[3]
	Thailand	7.6	7.5	7.0	2.8	2.5	49.5	52.5	0.2	0.8	2.8	3.7	3.3[5]
Memo item	Industrial countries	4.5	1.8	2.3	1.3	1.1	43.5	46.0	3.0	5.9	8.3	8.0	6.4

Sources: World Bank: Social Indicators of Development, Trends in Developing Economies and World Development Report; OECD: National Accounts, Labour Force Statistics and Historical Statistics; ILO: Yearbook of Labour Statistics and World Labour Report; and Statistical Yearbook of the Republic of China.

[1] Labour force in per cent. of total population. [2] In per cent. of labour force; for Latin America open urban unemployment in per cent. of urban labour force.
[3] 1988. [4] 1985. [5] 1986. [6] 1987.

partly applies also to Algeria and Tunisia) is that output growth tends to be relatively capital-intensive[8] and/or importantly influenced by weather conditions so that labour absorption is low.

Latin America is the region most severely affected by the debt problem and this can be seen in a sharp slowdown in output growth between 1973-80 on the one hand and 1980-89 on the other, and a general rise in open urban unemployment in 1982-83. Subsequently, labour market developments have differed quite substantially across the continent, depending in part on the policies adopted. Chile (and to a lesser extent Uruguay[9]), relying on trade liberalisation and tight fiscal and monetary policies, has managed to reduce open unemployment, and incomes policies combined with a high degree of real wage restraint have contributed to reducing inflation and unemployment in Mexico.[10] In Guatemala the civilian government which took over in 1986 introduced more stable fiscal and monetary policies and helped also by a positive response of the private sector and an improvement in the terms of trade, unemployment fell to 8%, while during the previous recession the number of unemployed had climbed to over 14% of the labour force. By contrast, in Argentina and Peru a worsening economic situation was reflected in a further rise in unemployment, while the 1985 stabilisation package in Bolivia has so far only broken the inflationary spiral and the negative output trend.

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8 The most dynamic sectors in Egypt have been the Suez Canal and oil production, which employ less than 1% of the labour force. In Algeria the strong output trend of the 1970s was partly generated by an investment/GDP ratio of nearly 45% and despite migration the rate of unemployment rose to 14% by the end of the decade. In the 1980s, when GDP growth declined and many workers returned, unemployment may have increased to 23%. According to the World Bank (1989), Tunisia shows a similar pattern, with the rate of unemployment rising to 15% by 1988 rather than remaining stable around 4%. The data for Ghana are also subject to severe measurement problems. The population survey provides a figure of 2.8% for the number of unemployed without previous work experience while according to the employment office statistics all job seekers account for only ½% of the labour force.

9 Uruguay is one of the few LDCs with demographic trends similar to those of industrial countries: i.e. low population growth and even slower growth of the labour force.

10 The low unemployment rate is also the result of employment-protecting measures (including very high lay-off costs for firms) and a generally low political tolerance threshold for open unemployment.

Venezuela and Colombia were affected by adverse terms of trade changes in 1985-86 and in the former case unemployment is likely to rise further following the stabilisation programme of 1989. Developments in Brazil are the most difficult to explain as the steep fall in output growth has been accompanied by a rising activity rate and a fall in open unemployment to only 3½%, and this despite a continuous rise in real labour costs (see below) and problems in implementing effective stabilisation policies.

The Asian countries present a rather heterogeneous picture with respect to both the level of unemployment (mainly reflecting measurement problems) and its development during the 1980s. In China, South Korea and Taiwan strong output growth has helped to reduce unemployment and raise the activity rate and a similar development has taken place in Thailand, though mainly after 1985. In Bangladesh, Indonesia and, especially, the Philippines weak output growth has clearly increased labour market slack, and unemployment in Malaysia has remained high despite a recent recovery in output. The labour market in Pakistan appears to be more or less independent of output developments, and an acceleration of growth in India has been accompanied by worsening labour market conditions, partly reflecting short-term influences, such as a particularly favourable monsoon, but also long-term effects of industrialisation and urbanisation, which have transformed underemployment into open unemployment. In addition, the important role assigned to large capital-intensive projects has tended to generate output growth with a low degree of labour absorption.

Explaining the relationship between output and employment growth is made difficult by long lags in the publication of employment data. Nevertheless, some interesting features and regional differences stand out from Table 3:

- lower output growth in most of the African countries has been almost fully reflected in employment, so that average productivity growth has remained relatively stable around 1%;[11]

- in Latin America, by contrast, average productivity growth fell from 3.5% in 1970-75 to -2% in 1980-85, as employment was only partially adjusted to the weaker output trend (see also ILO (1989)). The most recent

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11 Excluding Mauritius, which is an outlier in the African sample, productivity growth would have averaged 1% in all sub-periods.

Table 3

Developments in total output (Q), employment (EM) and productivity (PR): Selected countries

Region	Country	1970-75[1]			1975-80			1980-85[2]			1985-			Latest year
		Q	EM	PR	Q	EM	PR	Q	EM	PR	Q	EM	PR	
		Percentage change, annual average												
Africa	Algeria	-	-	-	10.1	7.2	2.7	3.9	4.3	-0.4	-	-	-	1985
	Burundi	2.4	-0.4	2.8	5.7	6.0	-0.3	4.9	3.3	1.6	5.1	5.5	-0.4	1987
	Cameroon	3.7	5.7	-2.0	4.9	8.0	-3.9	6.2	6.1	0.0	-	-	-	1984
	Egypt	5.4	2.3	3.0	8.8	1.6	7.1	7.1	4.8	2.2	-	-	-	1984
	Kenya	6.2	4.9	1.3	5.8	4.2	1.6	2.7	3.1	-0.4	5.8	3.8	2.0	1987
	Malawi	5.7	9.1	-3.1	4.3	8.5	-3.9	1.9	2.3	-0.4	1.6	-0.4	2.0	1987
	Mauritius	6.7	5.8	0.9	4.9	2.7	2.1	4.7	1.2	3.5	6.7	8.5	-1.7	1988
	Tunisia	8.5	3.3	5.2	5.8	3.3	2.5	3.3	2.6	0.7	-	-	-	1986
	Zambia	2.5	2.9	-0.4	0.0	-0.7	0.7	0.8	-1.0	1.8	0.6	-0.3	0.9	1986
	Zimbabwe	5.3	4.3	1.0	0.9	-0.8	1.7	5.1	0.7	4.4	-	-	-	1984
	Average	*5.2*	*4.2*	*1.0*	*5.1*	*4.0*	*1.1*	*4.1*	*2.7*	*1.4*	*3.3*	*2.2*	*0.8*	-
Latin America	Bolivia	5.8	3.0	2.7	2.5	2.7	-0.3	-2.1	-0.4	-1.7	-0.5	-0.5	0.0	1987
	Brazil	10.1	3.6[3]	6.3	4.4	3.6[3]	0.7	3.0	4.5	-1.5	8.2	4.1	4.0	1986
	Chile	-	-	-	7.5	3.7	3.7	-0.4	2.7	-3.0	7.0	4.4	2.5	1989
	Colombia[4]	-	-	-	5.3	8.3	-2.8	2.2	-0.7	3.0	5.2	7.2	-1.9	1987
	Peru	5.3	3.7	1.5	1.7	2.6	-0.9	-0.5	2.2	-2.7	9.5	7.5	1.9	1986
	Venezuela	4.8	1.5	3.3	3.3	3.9	-0.6	-1.3	3.8	-5.1	5.2	5.7	-0.5	1988
	Average	*6.5*	*3.0*	*3.5*	*4.1*	*4.1*	*0.0*	*0.1*	*2.0*	*-2.0*	*5.8*	*4.7*	*1.0*	-
Asia	India	-	-	-	3.5	2.5	1.0	5.5	2.0	3.5	6.3	1.6	4.6	1988
	Pakistan	3.6	3.2	0.4	6.0	3.2	2.7	6.6	3.3	2.5	-	-	-	1985
	Philippines	6.4	4.5	1.9	6.3	3.9	2.3	-1.0	3.4	-4.5	4.8	4.9	0.0	1988
	South Korea	9.5	3.9	5.4	9.1	2.9	5.9	7.6	1.8	5.7	10.3	4.0	6.1	1989
	Taiwan	8.8	5.1	3.5	10.7	3.8	6.6	6.5	3.0	3.4	10.4	4.2	6.9	1988
	Thailand	7.3	4.2	3.0	7.5	4.4	3.0	5.0	1.5	3.5	6.5	4.0	2.5	1987
	Average	*7.1*	*4.2*	*2.8*	*7.2*	*3.5*	*3.6*	*5.0*	*2.5*	*2.5*	*7.7*	*3.7*	*3.9*	-
Memorandum item	Industrial countries	2.9	0.9	2.0	3.3	1.4	1.9	2.4	0.6	1.8	3.5	1.8	1.7	1989

Sources: See Table 1.

[1] For Burundi 1972-75. [2] 1984 for Cameroon, Egypt and Zimbabwe; 1986 for Taiwan. [3] Average, 1970-80. [4] Only includes employment in seven major cities.

years have seen some recovery of productivity growth, but this may prove to be only transitory. Output growth in three major countries (Brazil, Venezuela and Peru) fell considerably in 1988-89. There may be two explanations for the negative productivity trend observed during the 1980s, though both are difficult to quantify. One is that wage earners adjusted their real wage aspirations in step with lower output, thereby enabling firms to maintain employment without any loss of profits. At first glance, this appears to have played a role in Chile and Mexico and possibly also in Peru, but not in Brazil where real earnings have increased by $2\frac{1}{2}$ - 3 3/4% per year. Secondly, the fall in output per employee may be due to a major shift from the formal to the informal sector, where capital and output per worker tend to be much lower. There is some evidence that such a shift has taken place,[12] but judging by the size of the change it is far too small to explain fully the fall in aggregate productivity;[13]

- average output growth in Asia also fell in the early 1980s and about half of the slowdown was reflected in lower productivity growth, with that of the Philippines turning negative to the tune of $4\frac{1}{2}$%. More recently, output growth has returned to its earlier trend and productivity growth has increased to more than 4%.

Table 4 shows developments in real earnings, which, together with the trends in labour productivity and in real per capita GDP, give some indications of the extent to which wage earners have borne their share of the adjustment burden and cushioned the employment effect of lower output

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12 Tokman (1986) and Riveros (1989a) both report increases in the employment share of the informal sector in Latin America of 2-3 percentage points during 1980-85 while ILO (1989) estimates the rise at some 5.5% for the period 1980-87. There are also large differences between countries, as the informal sectors in Argentina and Brazil have absorbed a large part of the growing labour force and a similar development, though less pronounced, may be seen in Mexico and Uruguay. In Chile, on the other hand, informal employment declined, which may partly explain the steep rise in open unemployment in the early 1980s. See Fallon and Riveros, op. cit.

13 At the same time, the fall in output growth in the urban sectors - and especially in the formal sectors - is likely to have reduced rural-urban migration and thus made it more difficult to reap the potential benefits of large productivity differentials. As will be shown in Part II, sectoral shifts have been a major factor in the growth performance of Taiwan and South Korea.

Table 4

Developments in per capita GDP and real wages: Selected countries

Region	Country	Real average wages			Real minimum wages			Real per capita GDP		
		1987	1988	1989	1987	1988	1989	1987	1988	1989
		Indices, 1980 = 100								
Latin America	Argentina	103	97	89	122	96	77	88	83	76
	Brazil*	102	107	106	73	69	71	101	99	100
	Colombia	119	118	119	113	110	111	111	113	114
	Chile	95	101	103	69	73	80	97	103	110
	Ecuador	-	-	-	61	54	42	87	101	99
	Mexico	73	72	-	61	54	51	91	90	91
	Peru	101	77	37	66	58	27	98	87	75
	Uruguay	98	100	99	91	86	79	94	93	93
	Venezuela	-	-	-	95	76	69	84	86	75
Africa	Burundi	105	-	-	-	-	-	113	116	119
	Egypt	113	99	-	-	-	-	129	134	139
	Kenya	77	-	-	-	-	-	95	97	99
	Malawi	65	-	-	-	-	-	91	91	92
	Mauritius	105	112	-	-	-	-	134	140	145
	Sierra Leone	25	-	-	-	-	-	90	88	85
	Tanzania	26	-	-	-	-	-	85	86	87
Asia	China	134	133	128	-	-	-	174	191	195
	Philippines	83	81	-	-	-	-	86	90	93
	South Korea	159	180	205	-	-	-	178	196	207
	Taiwan	145	155	-	-	-	-	157	167	177
Memo item:	Industrial countries	106	107	109	-	-	-	115	119	122

Sources: ILO: Bulletin of Labour Statistics and World Labour Report; IMF: International Financial Statistics; and the sources given in Table 1.

* Wage indices refer to Rio de Janeiro.

growth. Unfortunately, recent wage data are virtually absent for countries outside Latin America, though it appears that African wage earners have suffered large real income losses. The same may be observed for the Philippines, while in China, South Korea and Taiwan real wages have increased, though less rapidly than real per capita GDP.

For Latin America the data on average and minimum wages reveal two striking developments:[14]

- except for Brazil, Colombia and Chile average real wages were lower in 1989 than in 1980, pointing to a high degree of real wage flexibility. In fact, (see further below) Chile may be included among the countries with flexible wages, as real wages fell in response to the stabilisation policies implemented in 1982 and even after the 1988-89 recovery, real wage increases have remained well below the growth of real per capita GDP. By contrast, there is little evidence of real wage flexibility in Brazil[15] as widespread indexation has served to maintain the purchasing power of wages. In addition, protection against foreign competition has reduced firms' resistance to wage claims and, in the case of nationalised enterprises, rising wage costs have been met by higher subsidies rather than by higher prices;[16]

- in all countries minimum wages have fallen more or increased less than average wages. In some countries this trend has been the result of wage restraining policies, but, generally, it may be seen as evidence of

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14 In their analysis of real wage trends in Latin America, Mikkelsen and Paldam (1987) note three important features: (i) a year-to-year variability which is much higher than in industrialised countries, though partly due to large measurement errors in conditions of high inflation; (ii) average real wage increases which fall short of the growth of real per capita GDP by about 2 percentage points per year due mainly to the shift of employment from low to high productivity sectors; and (iii) a wage price process which only satisfies the homogeneity conditions over a time-horizon of several decades, implying that in the short to medium run nominal changes will have real effects.

15 In fact, using wage data for the highly industrialised Sao Paulo region, the rise in real wages during the 1980s would have been over 55%.

16 Resistance to real wage cuts has thus contributed to the rise in the public sector borrowing requirement and complicated the task of implementing more restrictive fiscal and monetary policies.

widening skilled/unskilled wage differentials and of a development biased against low-income households.[17] On the other hand, the steep fall in real minimum wages may have reduced open unemployment, as distortions caused by minimum wages exceeding productivity of the unskilled are likely to have been reduced. Moreover, to the extent that the minimum wage serves as the reservation wage for employees in the informal sector, more workers may have sought employment in the informal sector rather than waited for unskilled jobs in the formal sector.[18]

B. Labour demand equations: Some tentative results.

(a) Aggregate economy. Due to differences in data availability, the country sample has not remained the same in the four previous tables. This alone complicates analytical work and an additional problem is that several of the data series shown above are rather short and/or seriously out of date. Consequently, when attempting to analyse relationships between several variables, only a few countries qualify for inclusion.[19] Table 5a shows some tentative estimates of labour demand equations for six countries, using a first-difference version of a partial equilibrium model which is further discussed in Annex A:[20]

$$\text{dlog EM} = a + b_1 \text{ dlog Q} + b_2 \text{ dlog Q}_{-1} + c_1 \text{dlog RW} + c_2 \text{ dlog RW}_{-1} + e \text{ dlog EM}_{-1}$$

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17 Paldam and Riveros (1989) have analysed the relationship between changes in minimum and average wages using a causality test applied to six Latin American countries. Generally they find that changes in the minimum wage have only a limited effect on the wage structure due to wage drift in favour of high-income wage earners. However, the precise transmission mechanism is difficult to identify, since in two-thirds of the cases there is significant reverse causality.

18 However, very little is known about wages in the informal sector and it cannot be excluded that they have fallen relative to the minimum wage. ILO (1989) tentatively estimates the fall during 1980-87 at 40%, while a more rigorous analysis of this issue may be found in Lopez and Riveros (1989), who estimate a four-equation segmented labour market model using data for Argentina, Chile, Colombia and Uruguay.

19 Labour demand equations for South Korea and Taiwan will be discussed in greater detail in Part II.

20 Because of the small number of observations, no level terms are included.

Table 5a

Employment adjustment: Total economy

Country	Employment equations									Sample period
	C	dQ	dQ_{-1}	dRW	dRW_{-1}	dEM_{-1}	R^2	h/DW	SE	
Bolivia	0.8*	-	0.34**	-0.03[2]	-	-	0.55	2.0	1.1	1970-84
Chile	2.8**	0.79**	-	-0.35[2]	-	-0.36**	0.66	-0.5	3.1	1975-89
Kenya	3.2**	0.37**	-	-0.25[2]	0.13*	-0.27*	0.36	-1.4	1.9	1969-87
Malawi	-	1.52**	0.37*	0.47[2]	-	-0.23*	0.71	1.4	4.7	1970-88
Mauritius	-	0.33**	-	-0.05	-	0.56**	0.83	0.9	2.1	1970-88
Philippines	4.1**	0.14	-	-0.06	0.07	-0.27*	-0.12	n.d.	2.7	1970-88

* t-value: 1-2. ** t-value: > 2.

where EM = total employment in number of persons

Q = real GDP

RW = nominal wages in non-agricultural sectors deflated by GDP deflator or consumer prices.

According to the underlying hypothesis, Σb_i can be expected to be positive while Σc_i should be negative. However, when consumer rather than output prices are used in deflating nominal earnings and changes in real wage income have a strong and direct effect on domestic demand and output, it cannot be excluded that Σc_i will be positive. Such a bias is especially likely in low-income countries where wage earners have a larger propensity to spend than enterprises and the share of labour income in total GDP is high. $dlogEM_{-1}$ was included to capture the dynamics of the adjustment process, with $1 > e > 0$ implying a lagged but smooth adjustment to changes in output and real wages and $e < 0$ an adjustment with oscillations.

All six countries have seen very moderate wage behaviour, and in most cases real earnings have fallen over the sample period and particularly steeply during the 1980s. This is in sharp contrast to developments in industrial countries. There are, however, important differences between the six countries in the extent to which falling real wages have supported employment growth or can be interpreted as moderation on the part of wage earners.

The clearest case is Chile, for which an R^2 of 0.66 and significant and plausible parameters are obtained. Moreover, when the parameters are used in calculating contributions to employment changes, the supporting role of real wage restraint during the recent recovery is clearly seen (Table 5b). During the first period real earnings grew by 125% (compared with only 20% for labour productivity), but over the last seven years real earnings have fallen so that firms were able to expand labour demand in line with the recovery of output. In fact, the 7½% unemployment rate recorded in 1989 is regarded by several observers as being below the level corresponding to full employment.

Table 5b

Estimated contributions to employment changes in Chile.

(in percentages, cumulative figures)

	1975-82	1982-89
EM	8.3	50.0
Q	17.5	24.5
RW	-32.8	1.7
TREND	19.5	19.5
Residual	4.1	4.3

Kenya is another case where wage restraint has supported employment. Over the sample period the level of employment has approximately doubled, which may be ascribed to a trend rise of about 3% per year and a contribution from output growth of about 2%. Real wages in terms of output prices have fallen, suggesting that wage earners scaled down their wage claims in response to terms-of-trade losses (some 25% during 1980-87) and generally supported the maintenance of profit margins. Wage restraint has also been important in Mauritius and, as in Chile, there is evidence of a behavioural change over the sample period. During the 1970s, when Mauritius was still heavily dependent on sugar and industrial growth was seen as a substitute for imports, real earnings increased. However, following the slump in 1980-81 and the shift towards export-promoting policies, real earnings have fallen and helped to improve international competitiveness. This assessment, however, needs to be seen in the light of the rather poor labour demand equation, as the high R^2 mainly results from the lagged dependent variable and the real wage coefficient is numerically low and poorly determined.

Real wages have also fallen in Malawi, but in this case, the real wage coefficient is positive. Hence falling wages have reduced employment via direct domestic demand effects. This was especially evident in the 1980s when real earnings declined by a cumulative 45% and output growth, following a severe recession in 1980-81 and a second one in 1986, fell to only $2\frac{1}{2}$% per year. Although real wages in terms of output prices show a negative trend in Bolivia as well, it is probably premature to conclude that wage restraint has supported employment. The coefficient is very low, so that even with real wage costs falling by as much as 53% during 1980-84, the estimated "boost" to employment was only 2%. Secondly, in conditions where the rate of inflation attains five-digit figures, real wage changes

depend almost exclusively on the lag between price and wage adjustment. Thirdly, no wage data are available for the period of the New Economic Policy introduced in 1985. In the Philippines real wages have fallen by 6 3/4% per year during the 1970s and by 2½% during the 1980s. However, the estimated equation is so poor that neither the influence of output growth nor the role of real wages can be assessed. One reason for the poor result may be the widespread wage and price distortions existing in the 1960s and 1970s, which made the growth process capital and import intensive but generated relatively little labour absorption.[21] Moreover, estimates for labour supply growth during the 1980s range from 2½ to 4½% per year and the employment figures may be equally uncertain.[22]

(b) Manufacturing sector.[23] On the basis of World Bank data (World Tables, Edition 1989-90), it is possible to use a larger sample for analysing employment developments in the manufacturing sector. These data, of course, cover only a small part of the labour market, but may be representative of adjustment mechanisms in the formal sector. The actual developments in employment, real earnings (defined as nominal earnings deflated by consumer prices), output and productivity over the period 1970-86 are shown in Annex B and Table 5c presents labour demand equations using the same model as for the aggregate economy. The table also includes comparative estimates for the Group of Seven countries and OECD Europe and groups the results according to the following criteria:

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21 During 1973-80 real fixed investment rose by 12½% per year and imports by 7½%, while the rise in employment was only 3% despite the steep fall in real wages.

22 The higher estimate would seem more consistent with the recent rise in unemployment in conditions of rapid output growth and the phasing-out of some of the earlier distortions.

23 Riveros (1989c) also presents labour demand equations for manufacturing, applying the same specification as above, but with the variables measured in levels and earnings defined to include non-wage labour costs and deflated by wholesale rather than consumer prices. For Kenya and Chile his results are very similar to those shown in Table 5c, whereas for Argentina, Colombia and Mexico he finds negative real wage coefficients (though insignificant in the first two cases and numerically very small for Mexico). Positive real wage coefficients are reported for India and Pakistan.

Table 5c

Employment adjustment in manufacturing: Selected countries

Country	Employment equations									End-level relative to previous (%):					
										Trough			Peak		
	C	dQ	dQ_{-1}	dRW	dRW_{-1}	dEM_{-1}	R^2	h/DW	SE	EM	Q	RW	EM	Q	RW
Ecuador	0.8*	0.51**	-	-	-0.32**	0.32	0.93	-0.7	1.7	215	283	162	91	98	91
India	-	-	0.24**	-	-0.12*	0.42**	0.54	-1.9	2.5	146	280	155	97	100	100
Zimbabwe	-	0.30**	-	-0.27*	-	0.66**	0.70	1.7	3.1	170	280	171	96	100	100
Bolivia[1]	2.9**	0.26**	-	-0.76**	-	0.21*	0.80	2.5	4.2	130	143	160	89	73	100
Indonesia	-	0.43**	0.25**	-	-0.36*	-	0.66	2.3	6.9	347	1295	260	100	100	100
Malaysia	-	0.75**	0.29*	-1.07**	-	-	0.85	1.5	4.1	277	426	178	85	97	97
Philippines[2]	-	0.65**	-	-0.43**	-	-	0.74	1.8	6.7	161	175	119	64	73	85
Thailand	2.0	0.66**	-	-1.04**	-	-0.15*	0.86	-0.6	3.1	168	335	176	88	100	100
Chile[3]	2.3*	0.18**	-	-	-0.16*	0.25*	0.65	1.5	5.1	131	176	594	75	100	86
Malawi[4]	4.1*	0.38*	-	-0.35**	-	-	0.75	1.9	6.7	350	265	100	100	99	46
Kenya	2.6*	0.24**	-	-0.37**	-	-	0.40	2.2	5.1	275	757	104	100	100	61
Mauritius	-	0.24**	-	-0.22	-	0.80**	0.75	0.4	8.1	723	384	100	100	100	65
Uruguay	-1.8	1.00**	-	-0.21*	-0.14	-	0.54	2.0	9.8	107	100	139	49	65	72
Egypt[5]	7.0**	0.06*	-	-	-0.14*	-0.92**	0.58	-0.3	1.6	153	223	172	100	100	94
Ethiopia	4.3**	0.16**	-	-0.08*	-0.06	-0.44*	0.17	-0.5	2.7	195	355	113	100	100	54
Pakistan	1.5**	0.01	-	-0.05	-	-0.38**	0.20	0.8	1.7	118	358	200	100	100	100
Colombia	-	0.04	-	-	0.13*	0.84**	0.66	2.0	2.5	130	208	169	87	100	100
Mexico	-0.8*	0.46**	-	0.18**	-	0.42**	0.86	2.4	1.6	134	185	120	93	94	82
Argentina	-1.5*	0.29**	-	0.04*	-	0.57**	0.52	2.0	4.0	100	102	227	59	79	80
Venezuela	0.8	0.24*	-	-0.07	0.43**	0.42**	0.54	0.7	4.3	200	178	135	92	92	89
Ghana[6]	-	0.23**	-	-0.12*	0.13*	0.43**	0.55	0.9	5.8	102	100	100	66	33	12
Group of Seven[7]	-0.9**	0.43**	-	-0.23**	-0.07*	0.27**	0.96	-0.6	0.4	103	167	125	96	100	100
OECD Europe[7]	-1.2**	0.27**	0.18**	-	-0.13*	0.41**	0.72	-0.4	0.8	102	144	130	87	100	100

* t-value: 1-2. ** t-value: > 2. [1] Last year is 1984. [2] Also includes a dummy variable with 1974 = -0.5, 1976 = 1 and otherwise 0. [3] Also includes a dummy variable with 1975 = 0.5 and 1982 = 1 and otherwise 0. [4] Also includes a dummy variable with 1976 and 1980 = -1, 1977 and 1981 = 1 and otherwise 0. [5] Last year is 1982. [6] Last year is 1983. [7] Last year is 1988.

(i) countries with plausible and statistically well determined parameters of the expected sign (i.e. positive for output and negative for real earnings) and satisfactory diagnostic statistics;

(ii) countries for which the parameters are plausible and relatively well determined, but the standard error exceeds 3;[24]

(iii) countries where employment developments appear to be dominated by a trend or a high degree of autoregression;

(iv) countries with a positive real earnings coefficient.

Among the countries in the first group, employment in Ecuador rose steadily together with output during the 1970s, but fell sharply in 1980, initially as a result of higher real earnings and later, following a downward adjustment of real earnings, in response to weak output growth. In Zimbabwe, too, employment weakened in the early 1980s and partly due to falling output, but also reflecting an insufficient capital stock as the fixed investment/GNP ratio fell to less than 15%. Real wages, however, adjusted quickly and initially helped to support the recovery. More recently, real wages have had a negative employment effect as the rise in the minimum wage, aimed at reducing poverty, seems to have caused a more general increase in wages. Labour market developments in India are characterised by a slow adjustment process, as output and real earnings both influence labour demand with a one-year lag and the lagged dependent variable enters the equation with a large and significant coefficient.

The second group includes four Asian countries with R^2s of 0.65 or higher but rather large standard errors. The best results are obtained for Malaysia and Thailand which show an output-supported positive trend during the 1970s, but a break around 1980, which in both cases can be related to rigid real earnings as output growth remained positive.[25] This development was particularly pronounced in Thailand where the ratio of real earnings to productivity rose during 1980-86, whereas in Malaysia the wage share declined. Manufacturing employment in Indonesia has been dominated by

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24 I.e. the predicted employment growth rate is subject to an uncertainty range of ± 3% per year.

25 In Malaysia annual increases in nominal earnings are usually determined by pay scales prepared three years in advance.

output which, influenced by the policy of reducing the economy's dependence on oil, rose by an annual 17¼%, thereby boosting labour demand by nearly 12% per year. Real wages also rose sharply, but by less than labour productivity so that the growth process was accompanied (and probably reinforced) by a rising profit share. At first glance, the results for the Philippines look plausible: employment rose steadily up to 1981-82 boosted by positive output growth and falling real earnings, and then fell sharply during the 1980s as output declined and real earnings picked up. However, these results were only achieved after some ad hoc respecifications and without the dummy variable the equation produced very large residuals. A similar problem was encountered for Chile, which is rather unexpected given the promising estimates for the aggregate economy. The outcome, however, may reflect differences in the sample period, as the estimates for manufacturing contain more observations for the turbulent 1970s, when the country experienced a fundamental change in the economic as well as the political regime and was subjected to two major fiscal shocks.[26]

Among the African countries included in this group, the most satisfactory results are obtained for Kenya, where employment grew by 6% annually over the sample period, of which 38% can be ascribed to a positive trend, 45% to output growth and the remainder to moderate real earnings behaviour. Mauritius has experienced an unusually rapid expansion of manufacturing employment which, inter alia, reflects the policy of promoting industry and reducing the reliance on sugar. The growth trend was particularly steep in the 1980s when the effect of stronger output growth was reinforced by falling real earnings. The picture for Malawi looks more volatile and the results given in the table could only be obtained after some ad hoc respecifications. Although it is not implausible that real

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26 Fiscal policies were severely tightened in 1975 and 1982 and the dummy variable, which obtained a significant coefficient of -0.22, may be proxying the employment impact of fiscal policies. Another problem specific to the 1970s is the development in real earnings which is highly dependent on the consumer price index used (see also Riveros (1989b)). When estimating the employment impact of changes in the real minimum wage, Paldam and Riveros (1989) find a significant negative coefficient for the non-tradable sectors but no effect on total employment, suggesting - rather implausibly - that employment in the tradable sector, of which manufacturing constitutes a major part, may rise in response to higher real earnings.

earnings can have a positive impact on total employment but a negative one on manufacturing employment, the implied boost to employment of the recent fall in real earnings should be interpreted with caution, as the unadjusted equation produced insignificant coefficients. Caution is also called for in interpreting the results for Bolivia, even though the graph in Annex B reveals a striking inverse pattern between employment and real earnings. As noted earlier, changes in real earnings in a period of hyperinflation are almost entirely dependent on the wage price lag structure and, again, there are no data for the post-1985 period. Employment in Uruguay shows a steep fall in 1979-80 as output conditions worsened and real earnings continued to rise. Subsequently, real earnings adjusted to the fall in employment but have increased again in recent years, thus prolonging the weak employment trend.

Three of the countries in the third group show annual employment growth rates ranging from 1.5% in Pakistan to 7% in Egypt and an oscillating adjustment pattern which is particularly pronounced in the case of Egypt. The influence of output and real earnings development has been small, though there are some notable differences in real earnings which increased 4½% per year in both Egypt and Pakistan but fell 3% in Ethiopia. In the case of Colombia, the highly autoregressive structure of the estimated equation is compatible with the rather smooth development featuring a clear peak in 1980. However, it does not explain why significant effects of changes in real earnings and output could not be identified.

The fourth group, with positive real earnings coefficients, includes three heavily indebted Latin American countries. The employment trend in Mexico appears to be related to the outbreak of the debt crisis as employment peaked in 1982 (compared with 1976 and 1979-80 in Argentina and Venezuela respectively), but the inclusion of a dummy variable for 1982-86 produced only a marginal change. Although the manufacturing sectors in all three countries have been highly protected against foreign competition, it is difficult to explain the positive real earnings coefficients. In fact, in Mexico and especially in Venezuela, oil production has tended to raise the real effective exchange rate and cause a deterioration in the competitive position of the non-oil-producing sectors. Nonetheless, in both countries the real wage coefficients are highly significant and positive, and given the trend of real earnings it is difficult to escape the

conclusion that wage moderation in these countries reinforced the adverse employment effect of the fall in output.[27] The real wage coefficient is less significant for Argentina and probably reflects the net influence of policies aimed at boosting domestic demand through high real earnings, interrupted by shorter periods of substantial real depreciations and cuts in real wages to reduce the growing external imbalance. The outcome for Ghana is not too surprising, given the low standard of living and the exceptionally steep fall in real earnings.[28]

Two features are common to a large number of the countries discussed above and particularly to those in Latin America: a clear break in the employment trend in the early 1980s and a marked moderation or actual decline in real earnings occurring at around the same time. It thus appears that total wage earnings have declined in the 1980s and that the crisis has been accompanied by rising profit shares, though not necessarily by higher levels of real profits. The estimated labour demand equations are consistent with this observation since only two (for Malaysia and Thailand) of the twenty-seven real wage elasticities shown for LDCs in Tables 5a and 5c exceed unity. For two additional countries (Bolivia and Mauritius) the manufacturing real wage elasticity is close to unity, but in the former case the role of real wages is rather doubtful and in the latter the coefficient has a high standard error.

The shift in the functional income distribution in favour of profits also means that real earnings have increased less fast (or fallen more steeply) than labour productivity. Lopez and Riveros (1989) actually go one step further and argue that the correlation between real earnings and productivity has been negative in the 1980s, whereas in earlier years it was positive. To test this argument we estimated the equation:

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27 In the case of Mexico Riveros (1988) concludes that the absence of a significant employment rise in response to the fall in real earnings is due to labour market segmentation caused by employment-protecting measures and strong unions.

28 A reversal of the real earnings trend and of the compression of wage differentials has been included as part of the Economic Recovery Programme of 1983.

$$\text{dlog RW} = a + b \text{ dlog PR} + c \text{ DUM(81-86) dlog PR}$$

where PR = labour productivity and

DUM(81-86) = a dummy variable with 1981-86 = 1.

If the null hypothesis of a break holds, c should be negative and (in absolute terms) significantly larger than b. However, of the twenty countries included, only Mexico produced results which were consistent with the null hypothesis. c is also negative in Argentina, Bolivia and Chile, but only significant for Bolivia and in no case greater than b. For the remaining sixteen countries c was found to be positive (though in only seven cases statistically significant), but generally the equation produced very low R^2s so that the apparent rejection of the null hypothesis needs to be regarded with some caution.

Part II. Labour market developments in South Korea and Taiwan.

A. General features

We now turn to a more specific analysis of labour market developments in South Korea and Taiwan, for which long and detailed data series are available. As can be seen from Tables 6 and 7, both countries have experienced rapid output growth over the last two decades and there are three interdependent components of the growth process:

- high export growth, especially of manufactured goods;
- high national savings ratios which, especially in Taiwan, have supported a real investment boom;
- redistribution of employment and output from agriculture to manufacturing industries with an associated large boost to aggregate output growth because of large sectoral productivity differentials.

As a background to analysing the contribution and influence of labour markets it is also worth noting the very low share of total compensation in nominal GNP. This is likely to have supported the high saving and investment ratios while at the same time placing firms in a favourable competitive position as the associated wide profit margins have made it possible to absorb even large cost increases without having to raise output prices. The wide profit margins have also enabled firms to pursue aggressive pricing policies to gain market shares and, judging by the growth of export prices compared with those of average output prices

Table 6

Principal economic ratios

Items	South Korea			Taiwan		
	1968	1980	1988	1968	1980	1988
Employment, agriculture[1]	52.4	34.0	20.6	49.4	28.3	21.8
Employment, manufacturing[1]	12.8	21.6	27.7	11.8	25.9	29.5
Investment[2]	25.9	32.1	30.3	25.1	33.8	23.3
Saving[2]	14.7	20.6	37.1	22.4	32.2	35.3
Exports[2]	12.6	34.8	41.3	24.3	52.5	54.7
Labour compensation, aggregate economy[2]	32.1	42.6	40.0	41.4	46.9	49.9
Labour compensation, manufacturing[2]	n.a.	38.7[4]	39.2[5]	52.3[6]	60.1[6]	61.1[6]
"Real wage gap", aggregate economy[3]	100.0	109.9	109.0	100.0	98.3	104.5
"Real wage gap", manufacturing[3]	100.0	134.1	175.8	100.0	114.7	116.6
Rate of unemployment	5.1	5.2	2.5	1.7	1.2	1.7
Output per person: agriculture/manufacturing	0.56	0.29	0.38	0.22	0.20	0.17
Per capita income (US$)	191	1,637	4,082	305	2,348	6,177

[1] In per cent. of total employment.
[2] In per cent. of GNP, current prices.
[3] (Compensation per employee/output prices)/productivity, indices 1968 = 100.
[4] 1981.
[5] 1987.
[6] In per cent. of gross factor income.

Sources: See Table 7.

Table 7

Macroeconomic developments: Selected variables

Variables	South Korea				Taiwan			
	1968-80		1980-88		1968-80		1980-88	
	percentage changes, annual rates							
	Aggregate economy	Manufac-turing	Aggregate economy	Manufac-turing	Aggregate economy	Manufac-turing	Aggregate economy	Manufac-turing
Output[1]	9.6	16.6	9.1	11.7	9.8	14.3	8.1	8.9
Investment[1]	11.7	n.a.	10.1	n.a.	13.2	n.a.	5.0	n.a.
Exports[1]	21.7	n.a.	13.6	n.a.	17.8	n.a.	23.7	n.a.
Employment	3.4	8.0	2.6	5.9	5.0	12.1	2.7	4.4
Productivity	6.0	8.0	6.2	5.5	4.6	1.9	5.2	4.3
Wages	25.1	26.9	9.7	13.1	14.0	11.1	8.6	8.7
Unit labour costs	18.0	17.5	3.3	4.2	9.0	9.1	3.2	4.2
Output prices	18.5	14.6	5.5	3.6	9.1	7.3	2.9	2.8
Consumer prices	15.9	-	5.6	-	9.4	-	2.7	-
Export prices[2]	15.1	-	5.5	-	8.4	-	0.2	-
US$-exchange rate	6.7	-	2.3	-	- 0.9	-	- 2.9	-
Real effective exchange rate[3]	n.a.	-	- 1.6	-	n.a.	-	0.6	-

1 In constant prices.
2 Unit values.
3 Based on consumer prices.

Sources: Economic Statistics Yearbook, Bank of Korea and Statistical Yearbook of the Republic of China.

and unit labour costs, this may have occurred in South Korea during the 1970s and in Taiwan during the 1980s.[29]

There are, however, also important differences in the general trends of the two countries. In particular, the rise in nominal labour costs and the rate of price inflation have been much higher in South Korea than in Taiwan and this has been reflected in exchange rate developments, as Taiwan has been able to revalue its currency relative to the US dollar, whereas South Korea - especially during the 1970s - had to devalue its currency to maintain international competitiveness. Taiwan also seems to have gained more from sectoral output and employment shifts as the productivity ratio between agriculture and manufacturing has been below that of South Korea and has actually fallen over the period considered. Differences are also found in the labour markets and in the wage and price formation process and these will be further discussed in the following sub-section.

B. Labour market developments.

In analysing labour market developments we have relied on a simple model comprising only three equations (a labour demand equation, a nominal wage equation and an output price equation) and applied to manufacturing as well as the aggregate economy.

The three equations are estimated separately on the assumption of a semi-recursive system, where wages are first determined in negotiations between firms and unions. Given wages, firms can then choose their output prices and labour requirements, taking account of general demand conditions, the degree of market competition and existing technologies. The details underlying the model are further explained in Annex A and below we merely present the equations and the empirical results.

(a) Labour demand. The labour demand equation is based on the assumption that some firms are subject to an aggregate demand constraint (Keynesian regime) while others - mainly those competing in international markets - have to observe a price constraint (classical regime). Accordingly, the equation comprises real output (with an expected positive

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29 Since the exporting sectors typically have higher productivity increases than the economy in general, the unit labour cost figures given in Table 7 may not be representative of labour cost developments in the exporting sectors.

coefficient) and real wage costs (with a negative coefficient) and by including variables in both levels and first differences, it is possible to identify long-run parameters as well as the short-run adjustment pattern:[30]

$$\text{(i)}\quad \text{dlog EM} = a_1\text{dlog EM}_{-1} + a_2\text{dlog Q} + a_3\text{dlog RCOMP} + a_4\text{log (Q/EM)}_{-1} + a_5\text{log RCOMP}_{-1} + a_6\text{log (EMP/EM)} + a_0$$

with EM = employment in number of persons
Q = value added in constant prices
RCOMP = compensation per employee/value added deflator
EMP = number of employees (only included in aggregate equation).

Both equations for Taiwan yield a very close fit and well determined coefficients of the expected sign (Table 8). The short and long-run output elasticities are the same in manufacturing and non-manufacturing, whereas the real wage elasticities are numerically higher for the former. This was to be expected given the larger proportion of firms exposed to international competition and, therefore, likely to be in a classical regime. The final term in the aggregate equation (EMP/EM) can be interpreted as a correction for structural changes associated with the shift from agricultural to industrial employment. When families leave agriculture to look for industrial jobs, the number of employees will rise[31] whereas total employment may actually fall as some persons previously registered as unpaid family workers or part-time employees may decide to leave the labour force or register as unemployed. Turning to part (b) of Table 8, real wages have provided a negative contribution which is relatively high in the manufacturing sector, but entirely because of the numerically higher elasticity, as the rise in RCOMP has been about 1 percentage point per year less than for the aggregate economy. Nonetheless, and rather surprising in view of the impressive employment performance, real wage cost increases have exceeded productivity growth by far more than

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30 The lagged employment level was also included in initial estimates, but was never significant. The long-run output elasticities are, therefore, unity in all cases.

31 The simple correlation between the employment share of agriculture and EMP/EM is -0.9.

Table 8

(a) Labour demand equations

Country	Sector	C	$dlogEM_{-1}$	dlogQ	dlogRCOMP	$log(Q/EM)_{-1}$	$logRCOMP_{-1}$	logEMP/EM	R^2	DW/h	SE
Taiwan	Aggregate	0.59 (2.8)	-	0.42 (3.8)	-0.28 (2.1)	0.52 (4.3)	-0.39 (3.8)	-0.73 (5.4)	0.74	1.6	1.3
	Manufacturing	1.46 (5.8)	-0.21 (2.7)	0.47 (8.8)	-0.68 (12.6)	0.38 (4.7)	-0.36 (6.0)	-	0.95	-0.4	1.6
South Korea	Aggregate	0.05 (0.6)	-	0.15 (1.3)	-	0.27 (3.1)	-0.14 (2.6)	-0.24 (2.4)	0.44	2.0	1.3
	Manufacturing	2.28 (4.0)	-	0.83 (6.5)	-0.11 (1.0)	0.61 (4.5)	-0.42 (4.3)	-	0.81	2.1	2.7

(b) Long-run elasticities and contributions

Country	Sector	Long-run elasticities			Contributions (in per cent. per year)				
		Q	RCOMP	EMP/EM	Q	RCOMP	EMP/EM(TR)	Total	Actual
Taiwan	Aggregate	1.00	- 0.75	- 1.40	9.0	- 3.2	- 1.7	4.1	4.1
	Manufacturing	1.00	- 0.96	-	12.5	- 3.8	-	8.7	8.8
South Korea	Aggregate	1.00	- 0.52	- 0.89	9.3	- 4.6	- 1.9	2.8	3.1
	Manufacturing	1.00	- 0.69	-	14.7	- 6.1	-	8.6	7.3

in the aggregate economy as a result of a weak productivity trend in the 1970s.[32] All in all, this suggests that even though the expansion of manufacturing employment has been facilitated by a high degree of employee wage restraint, it was accompanied by a marked rise in the "real wage gap" (see Table 6).

Although less well determined the estimates for South Korea reveal some interesting differences from Taiwan, especially with respect to the role of real labour costs. Firstly, as a result of unusually large nominal wage increases - and despite numerically lower elasticities - the negative contributions of real wages are higher than for Taiwan. Secondly, the rise of RCOMP in manufacturing has been twice as high as in the aggregate economy,[33] reflecting above-average nominal wage increases as well as below-average output price changes. The labour demand equations thus do not point to any wage restraint in South Korea and there is also some evidence that manufacturing firms may have faced certain problems in raising output prices in line with labour costs.[34]

(b) Wage equations. The wage equations are based on the hypothesis that employees - or their unions - have a certain target for the growth of pre-tax real earnings. The target may be set in terms of a simple time trend or may be geared to productivity growth, and it is further assumed that in periods of low (high) unemployment employees will bargain for (accept) wage increases above (below) the long-run target. Allowing also

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32 The weak productivity trend is also difficult to explain. Fujita and James (1990), using input-output data and analyses, find that productivity growth has been as high as in South Korea.

33 At the same time, and unlike in Taiwan, productivity growth in manufacturing has been stronger than in the aggregate economy. This may be taken as further evidence of the lack of wage restraint in South Korean manufacturing, since only firms with strong productivity growth will "survive" in conditions of high nominal wage increases.

34 It should be recalled, however, that an earnings index was used for manufacturing, since compensation data are only available for the 1980s.

for adjustment lags, this produces the following specification for the productivity version:[35]

$$\text{(ii)}\quad \text{dlog COMP} = b_1 \text{dlog COMP}_{-1} + b_2 \text{log U} + b_3 \text{dlog PC} + b_4 \text{dlog PR} + b_5 \text{log(COMP/PC)}_{-1} + b_6 \text{log PR}_{-1} + b_0$$

with COMP = compensation per employee
PC = consumer prices
PR = outout per person employed
U = rate of unemployment.

As Table 9 below shows, the real wage hypothesis produces satisfactory results for Taiwan, with high R^2s and most coefficients significant and of the right sign. One exception is the rate of unemployment, which has a low significance in the aggregate equation and had to be entered as a first difference in the equation for manufacturing. This implies that the trade-off between the level of real earnings and the rate of unemployment is generally very weak in Taiwan and does not exist at all in manufacturing as a fall (rise) in U will only cause a transitory rise (fall) in real earnings. In other words, for the manufacturing sector there is clear evidence of hysteresis, allowing the authorities to run the economy at a high level of activity without incurring the risks of an inflationary spiral driven by wages. Furthermore, while the coefficient of long-run productivity growth exceeds unity in manufacturing, productivity growth has, as noted, been very low, so that wage earners have actually accepted a fall in their relative earnings position and thus helped to prevent unit labour cost growth from getting out of line with developments in competing sectors and countries. Finally, setting the target in terms of real earnings rather than real labour costs has led to only minor deviations from the equilibrium growth path, since the rise in consumer prices has been only marginally higher than that of output prices.

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35 The lagged nominal wage level was also included in initial estimates but was never significant, implying that employees set their long-run targets in terms of real rather than nominal earnings.

Table 9

(a) Wage equations

Country	Sector	C	logU	dlogPC	dlogPR	log(COMP/PC)$_{-1}$	logPR$_{-1}$	dlogCOMP$_{-1}$	R^2	DW/h	SE
Taiwan	Aggregate	0.88 (2.6)	-2.20 (1.0)	0.69 (11.9)	-	-0.39 (2.3)	0.34 (2.3)	-0.17 (2.3)	0.93	-0.2	1.8
	Manufacturing	1.24 (1.9)	-3.87 (1.3)[1]	0.99 (11.9)	0.75 (5.9)	-0.30 (1.8)	0.38 (2.0)	-	0.88	2.0	2.7
South Korea	Aggregate	0.38 (1.6)	-9.39 (2.0)	0.78 (6.2)[2]	-	-0.19 (1.1)[2]	0.14 (1.1)	0.30 (2.8)	0.92	-0.3	2.3
	Manufacturing	2.67 (3.4)	-27.60 (2.9)[-1]	0.73 (3.4)	0.42 (1.6)	-0.50 (2.9)	0.36 (2.5)[3]	0.35 (1.7)	0.72	-0.4	4.2

[1] dlogU.
[2] Price variable refers to output deflator.
[3] Trend.

(b) Long-run real wage elasticities

Country	Sector	U[1]	Q
Taiwan	Aggregate	3.0	0.90
	Manufacturing	-	1.27
South Korea	Aggregate	11.9	1.27
	Manufacturing	13.7	7.30[2]

1 Percentage change in wages in response to 1 percentage point fall in U.
2 Target growth rate per year.

The equations for South Korea are again less satisfactory, especially for the aggregate economy, where the coefficients of the two level terms provide only weak support for the real wage hypothesis. Moreover, even if the level terms are accepted, the equation cannot be interpreted as reflecting employee wage targets since output prices and not consumer prices are used in deflating nominal wages.[36] It thus appears that employer interests have generally prevailed and led to wage adjustments in line with output prices. At the same time, the extremely high cyclical sensitivity has meant strong wage pressures during periods of excess demand for labour, though unemployment has on average been high enough to keep real labour cost growth for the aggregate economy somewhat below the trend of labour productivity. The manufacturing sector presents an entirely different picture. In the first place, the employee wage target is well supported by the data and in this context it is also relevant to note that consumer prices on average have increased 1.5 percentage points faster than manufacturing output prices. Secondly, the target is set in terms of a simple time trend which, at 7¼%, has been more than 1 point above average productivity growth. Thirdly, the cyclical sensitivity is even higher than in the non-manufacturing sectors, so that excess labour demand has contributed to the very large and negative employment effect of real labour costs seen in Table 8b. Indeed, were real labour costs to have grown in line with productivity, the rate of unemployment should have been maintained at 5.6%,[37] compared with an actual average rate of only 4.2%. Hence the labour situation in South Korean manufacturing can be characterised as one of continuous excess demand, with the negative influence of excessive real labour costs being offset by strong output growth combined with a policy of devaluing the exchange rate to preserve the international competitiveness of manufactured goods.

(c) Output price equations. The output price equations are based on the assumption that long-run output prices follow a path determined as a

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36 When the equation was estimated with consumer prices several coefficients obtained the wrong sign, and when both prices were included the results were dominated by output prices.

37 This figure was obtained by setting average real earnings equal to average labour productivity adjusted for the deterioration in the manufacturing terms of trade and solving the equation for U.

weighted average of export prices and unit labour costs, with the latter serving as a measure of overall costs and the former as a constraint imposed by price developments in international markets. The rate of capacity utilisation may enter the equation, though with an a priori undetermined sign, and, allowing also for short-run adjustments, the specification becomes:

$$\text{(iii)} \qquad \text{dlog } P = c_1 \text{dlog } P_{-1} + c_2 CAP + c_3 \text{dlog ULC} + c_4 \text{dlog PX} + c_5 \log(ULC/P)_{-1} + c_6 \log(PX/P)_{-1} + c_7 \log P_{-1} + c_0$$

with
P = value added deflator
CAP = log ratio of actual to trend output
ULC = unit labour costs
PX = export unit values

The most interesting of the four equations shown in Table 10 is that for manufacturing output prices in South Korea. Firstly, prices appear to be adjusted counter-cyclically, whereas in the other three cases they were found to be pro-cyclical. Secondly, the long-run elasticity of export prices is smaller than for the aggregate economy and the two long-run elasticities do not add up to unity. This suggests that firms have not been able to maintain their mark-ups and output price changes have actually fallen far short of the rise in unit labour costs and have not even kept pace with export prices. The results, therefore, confirm the earlier impression that the manufacturing sector has mostly been in a state of excess demand. In fact, on the assumption that prices should have increased at the same rate as unit labour costs and taking the actual rise in export prices as given, the average rate of capacity utilisation should have been about 2 percentage points lower,[38] which is to be compared with the 5.6% unemployment rate mentioned above.

Export prices also play a significant role in the aggregate price equation for South Korea, but non-manufacturing firms do not appear to have faced any constraints on their pricing policies, as the sum of the long-run

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38 This is obtained by setting P = ULC and solving the long-run price equation for CAP.

Table 10

(a) Output price equations

Country	Sector	C	dlogULC	dlogPX	$\log(ULC/P)_{-1}$	$\log(PX/P)_{-1}$	$\log P_{-1}$	CAP	R^2	DW*	SE
Taiwan	Aggregate	-0.94 (1.4)	0.39 (2.8)	0.52 (5.8)	0.33 (1.2)	0.21 (2.0)	0.05 (2.2)	0.25 (1.0)	0.93	1.8	1.8
	Manufacturing	-0.26 (2.5)	0.40 (3.1)	0.45 (2.1)	0.38 (1.9)	-	-0.05 (1.2)	0.17 (1.5)	0.90	2.0	2.2
South Korea	Aggregate	-0.36 (2.4)	0.69 (9.2)	0.38 (5.0)	0.32 (1.7)	0.36 (3.2)	0.08 (2.5)	0.22 (1.2)	0.94	1.6	1.8
	Manufacturing	0.45 (2.5)	0.59 (5.5)	0.47 (5.1)	0.35 (2.3)	0.19 (1.5)	-0.10 (2.6)	-0.34 (2.7)	0.84	2.6	2.8

* $d\log P_{-1}$ was not significant.

(b) Long-run elasticities

Country	Sector	ULC	PX	CAP
Taiwan	Aggregate	0.67	0.42	0.50
	Manufacturing	0.88	0.00	0.39
South Korea	Aggregate	0.53	0.60	0.37
	Manufacturing	0.55	0.30	-0.53

elasticities exceeds unity. Consequently, had the average rate of capacity utilisation been kept at a somewhat lower level, it would have been possible to redistribute profits in favour of the manufacturing firms and at the same time reduce upward pressure on the aggregate price level.

In the case of Taiwan, both equations yield very high R^2s and well determined coefficients, except for the cyclical elasticities. Nonetheless, in view of the even weaker cyclical sensitivity of nominal wages, it appears that real labour costs in Taiwan tend to fall in periods of strong cyclical growth, and particularly in manufacturing where, as noted above, lower unemployment only has a transitory effect on wage claims. Non-manufacturing firms do not seem to have faced any mark-up problems since the sum of the long-run elasticities exceeds unity, whereas for manufacturing it was not possible to identify any long-run elasticity for export prices. Given the openness of the Taiwanese economy and the impressive export performance, this result is not easy to interpret. One possibility is that unit labour cost developments in manufacturing as a whole are not representative of firms involved in international trade. Alternatively, considering the very small rise in export prices during the 1980s when the rise in real exports was particularly strong, firms may have cut their margins on foreign sales in the interests of gaining market shares and accepted a partial compensation through higher margins on the domestic market. Whatever the explanation, the small rise in export prices combined with weak productivity growth led to a rise in "the real wage gap" (see Table 6) which was well above that found for the aggregate economy though small compared with that observed for South Korea.

Part III. Summary and conclusions.

Based on the preceding empirical analysis the answers to the questions and issues raised in the Introduction may be summarised in two points:

- with a few exceptions real wages in LDCs appear to be much more flexible than in industrial countries and in several cases real wages have actually fallen and not merely decelerated;

- yet real wage flexibility does not seem to have had the expected and desired influence on labour demand since employment has generally declined and in some countries more than real output.

Given the slump in real output and the unfavourable terms-of-trade developments it would have been difficult to avoid repercussions in the labour markets. Nonetheless, the above two points raise the additional question as to why the employment response to real wage restraint has been so weak, and in this context the following observations seem relevant:

(i) For several reasons the measured fall in real earnings overstates the degree and durability of real wage restraint:[39]

- in most countries nominal wages do not immediately respond to higher prices, so that in conditions of high and accelerating inflation real wages tend to decline. Depending on the lag structure of the wage price process and the time pattern of price increases, real wages, however, eventually return to their initial level and growth path;

- due to the rise in the number of workers on short time, part of the fall in nominal and real earnings merely reflects a decline in labour input rather than less aggressive bargaining by employees;[40]

- average earnings in both manufacturing and the total economy have been influenced by falling public sector wages, caused by expenditure-cutting measures. This has been particularly evident in countries facing balance of payments difficulties but, again, is not indicative of any shift in employee attitudes.[41]

(ii) Despite the rise in profit shares, the level of real profits has generally fallen. Together with the bleak outlook for demand growth and

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39 Uncertain data and measurement errors have also played a role, but it is difficult to identify a systematic influence on real wages and employment. Measurement errors have, however, biased the estimated output and real wage elasticities towards zero and made them appear smaller - in absolute terms - than those observed for industrial countries.

40 On the other hand, since short-time working is likely to prevent a fall in the number of persons employed, it does not explain the low real wage elasticities of the labour demand equation and the generally weak employment response.

41 On this point see Fallon and Riveros (1989) who also present evidence of a systematic compression of wage differential within the public sector.

the more difficult borrowing conditions, this has probably contributed to a weakening of investment spending. Indeed, for all LDCs the investment/GDP ratio has declined by 3.5 percentage points during the 1980s and in the fifteen heavily indebted countries the fall has been almost twice as large. Moreover, in those countries where the public sector has traditionally served as an "employer of last resort" the more restrictive fiscal policies of the 1980s have reduced public sector employment growth. Neither factor is explicitly included in the estimated labour demand equations but may have influenced labour market developments in two important ways. Firstly, with less real capital and lower public sector growth, the equilibrium real wage level has fallen, so that the recorded decline in real wages overstates the incentive to increase the labour intensity of production. Secondly, although the lack of capital stock data precludes a more precise assessment, it is highly likely that many enterprises have been forced to reduce their labour force (or have refrained from hiring new employees) because the required output capacity was not available.[42] In fact, as recognised in recent labour market models for industrial countries, neither higher output growth nor real wage restraint will have much impact on labour demand if the principal constraint is a shortage of output capacity.

(iii) In countries where natural resources account for a large share of exports, while manufactured goods are mainly sold in the domestic market, the real wage elasticity of labour demand is likely to be quite low.[43] Many Latin American and Sub-Saharan countries belong to this group and the low real wage elasticities have the additional implication that the degree of real wage restraints required to achieve a given improvement in the external account will be correspondingly higher.[44]

(iv) An important influence, for which this paper has provided only scattered evidence and no quantitative assessment, is the existence of labour market rigidities and segmentation. The fact that only a few African and Latin American countries have been able to expand exports despite

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42 Lack of other non-labour inputs due to policies of import compression may have had a similar - though more transitory - effect.

43 The high share of employment in the public sector and the latter's earlier role as "employer of last resort" may also help to explain the low real wage elasticities of the labour demand equation.

44 This point is further discussed in Sachs (1990).

substantial real devaluations and - at least for the second half of the 1980s - rising demand in the industrial countries points to serious constraints on resource mobility, and labour market rigidities may be one cause. Rigid wage differentials and union activities are known to have slowed down resource shifts between the tradable and non-tradable sectors (despite a generally high geographical mobility of the labour force), and in several countries employment protecting measures have made firms reluctant to expand their labour force. The role of the informal sector in this context is difficult to evaluate. In theory, the informal labour market should satisfy the conditions of a free market, including market-clearing real wages and a quick adjustment to excess demand and supply. However, minimum wages and the higher wages in the formal sector are likely to reduce the downward flexibility of informal wages and make workers prefer temporary unemployment to employment in the informal sector. Moreover, employment decisions in small family-based enterprises are difficult to explain within traditional labour market models, and official statistics provide only a partial picture of developments in the informal sector.

(iv) Many Latin American and African countries encountered problems already in the 1970s due to terms-of-trade shocks, distorted prices and wages (including overvalued exchange rates) and inadequate macroeconomic policies. However, they were able to maintain relatively high rates of growth thanks to favourable external borrowing conditions. This situation changed dramatically in the 1980s implying that labour markets not only had to "absorb" the weaker demand trends but also the past imbalances. In other words, employment developments in the 1980s may contain a negative stock adjustment effect on top of the unfavourable output trend.

Turning to prospects for the future, a key question concerns the conditions under which employment growth will return to the higher rate of earlier years. Given the significant output elasticities found in virtually all the labour demand equations, stronger demand growth is clearly a necessary condition, but it is not sufficient. Thus a rise in the investment/GDP ratio is crucial to reducing the risk of capacity constraints and to supporting more rapid productivity growth. Moreover, a continuation of general real wage restraint will be needed to maintain profits, and in view of the balance of payments constraint faced by many

countries it is even more important that real wages in the tradable sectors fall relative to those in the non-tradable sectors and possibly even in absolute terms. Finally, because of rigidities and other market imperfections the response to relative price shifts needs to be reinforced by policies promoting resource mobility, including changes in wage-setting procedures.

The experience of South Korea and Taiwan provides clear evidence that export-oriented policies based - especially in South Korea - on promoting the industrial sector generate favourable employment effects and strong real wage growth. However, it also appears that within this overall picture the role of labour markets and employee attitudes can differ significantly:

- in Taiwan employees in the manufacturing sector have shown a high degree of nominal and real wage restraint, which was particularly important given the weak productivity growth and generally helped to keep inflation low. The reasons for wage flexibility have not been explored but one factor may be that most manufactured goods are produced in small firms, where relations between employers and employees are likely to be closer and more co-operative than in large enterprises;

- in South Korea, by contrast, manufacturing is dominated by a small number of very large enterprises which are strongly supported by the authorities but frequently "clash" with the unions. Nominal wage increases have been much higher than in Taiwan, with real wage cost increases outstripping productivity growth by a wide margin. To support employment growth and maintain international competitiveness the authorities have, therefore, relied on expansionary macroeconomic policies and devaluations of the exchange rate. However, to allow the economy to "cool off" and to prevent a further acceleration of inflation it has also been necessary to resort to severe demand-restricting policies over short periods.

ANNEX A

The purpose of this Annex is to give a more detailed explanation of the hypotheses underlying the three equations used in the text, including the likely sign and size of the parameters.

A. Labour demand

During the 1960s and 1970s most labour demand estimates were derived from equations specified in first differences. However, since both the Keynesian and classical theories of labour demand are stated in levels and recognising also that first-difference forms impose prior restrictions compared with more general lag structures, most recent studies[1] of labour demand have been based on employment equations estimated in levels. We have followed this recent trend in using the methodology proposed in Davidson et al. (1978), which essentially starts from a long-run labour demand function in level form, with the final estimating equation designed to be data consistent and to permit a distinction between transitory and permanent effects.[2] In deriving the estimating equation we have drawn on several hypotheses so that the final outcome can be interpreted as a "mixed" equation which incorporates demand as well as price-constrained sectors and firms.

(a) Keynesian regime

In the long run desired employment (EM^*) is assumed to depend on the expected level of output (Q^*) and the expected ratio between capital and labour costs $(R/W)^*$:[3]

(i) $$EM^* = (Q^*)^a((R/W)^*)^b$$

Taking logs and assuming that the expected and desired values can be approximated by a distribution over current and two-year lagged values for

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1 See Bean et al. (1986), Newell and Symons (1985), Bruno (1986) and Andrews et al. (1984).

2 This method essentially combines the now very popular two-step procedure into one equation with freely estimated coefficients.

3 In this annex compensation per employee will be denoted by W.

EM and Q, but using only one lag for R/W, a short-term employment equation may be written as:

$$(ii) \quad em_t = a_1q_t+a_2q_{t-1}+a_3q_{t-2}+b_1(r-w)_t+b_2(r-w)_{t-1}+a_4em_{t-1}+a_5em_{t-2}$$

which can be reparametrised to:

$$(iii) \quad dem_t = a_1dq_t-a_3dq_{t-1}-a_5dem_{t-1}+b_1d(r-w)_t+(b_1+b_2)(r-w)_{t-1} +(a_1+a_2+a_3)(q-em)_{t-1} + (\Sigma a_i-1)em_{t-1}$$

where d is the first difference operator. The long-run solution in level form is then obtained as:

$$(iv) \quad EM = (R/W)^{(b_1+b_2)/B} \; Q^{(a_1+a_2+a_3)/B}$$

where $B = 1-a_4-a_5$. By this solution the parameters of equation (iii) can be interpreted in terms of an error feedback equation with the following key parameters and adjustment mechanisms:

- a_1, a_3, a_5 and b_1 measure the short-run response of employment to changes in output and relative factor prices may be interpreted as a <u>differential</u> adjustment mechanism;

- $(q-em)_{t-1}$ and $(r-w)_{t-1}$ act as <u>feedback</u> mechanisms while $(a_1+a_2+a_3)$ and (b_1+b_2) essentially determine whether a specification in level form is accepted by the data;

- Σa_i-1 can be given two interpretations. It serves as a <u>cumulative</u> adjustment mechanism since all past errors will be accumulated in em_{t-1}. Secondly, the long-run elasticity of employment with respect to output depends on the coefficient on em_{t-1}, with a positive (negative) coefficient implying an output elasticity larger (smaller) than 1.

(b) <u>Classical regime</u>

Ignoring developments in the capital stock and technical progress, the long-run desired level of employment for firms in the classical regime depends only on the expected real wage $(W/P)^*$:

$$(v) \quad EM^* = (W/P)^*)^h$$

Taking logs and assuming that a short-run approximation may be captured by two lags on W/P and EM, (v) becomes:

$$(vi) \qquad em_t = h_1(w-p) + h_2(w-p)_{t-1} + h_3(w-p)_{t-2} + h_4 em_{t-1} + h_5 em_{t-2}$$

which can be reparametrised as:

$$(vii) \qquad dem_t = h_1 d(w-p) - h_3 d(w-p)_{t-1} - h_5 dem_{t-1} + (h_1 + h_2 + h_3)(w-p)_{t-1} + (h_4 + h_5 - 1)em_{t-1}$$

From equation (vii) the long-run elasticity of employment with respect to the real wage rate may be derived as $(h_1+h_2+h_3)/(1-h_4-h_5)$ which, of course, will equal -1 when the coefficient on em_{t-1} equals that on $(w-p)_{t-1}$.

(c) Mixed regime

When the proportions of firms in the Keynesian and classical regimes are $1-\delta$ and δ respectively and remain constant over time, the aggregation of equations (iii) and (vii) yields:

$$(viii) \quad dem_t = m_1 dq_t + m_2 dq_{t-1} + m_3 d(w-p)_t + m_4 d(w-p)_{t-1} + m_5 dem_{t-1} + m_6(q-em)_{t-1} + m_7(w-p)_{t-1} + m_8 d(r-w)_t + m_9(r-w)_{t-1} + m_{10} em_{t-1}$$

with:

$$m_1 = a_1(1-\delta) > 0 \qquad m_6 = (a_1+a_2+a_3)(1-\delta) > 0$$
$$m_2 = -a_3(1-\delta) \gtrless 0 \qquad m_7 = (h_1+h_2+h_3)\delta < 0$$
$$m_3 = h_1\delta < 0 \qquad m_8 = b_1 > 0$$
$$m_4 = -h_3\delta \gtrless 0 \qquad m_9 = b_1 + b_2 \gtrless 0$$
$$m_5 = -(1-\delta)a_5 - \delta h_5 \gtrless 0 \qquad m_{10} = (1-\delta)(\Sigma a_i - 1) + \delta(h_4+h_5-1) \gtrless 0$$

Equation (viii) is the estimation equation for the results reported in the text, except that (r-w) was dropped due to lack of data. The key parameters are m_6 and m_7 since they determine whether demand and real wages have a permanent or only a transitory effect on the demand for labour. m_{10} is also important as it gives some indication of the likely size of the output and real wage elasticities of the two regimes. Because equation (viii) is under-identified, it is generally not possible to calculate the structural elasticities precisely. Nonetheless, $m_{10} \geq 0$ would point to an output elasticity in the Keynesian regime which exceeds unity, whereas the real wage elasticity may be either higher or lower than unity (in absolute terms), depending on the relative size of m_6, m_7 and m_{10}. For $m_{10} < 0$, which is the most commonly found result, the reduced-form income elasticity

is below unity, but if $(1-\delta)$ were sufficiently small the structural elasticity might still exceed unity, as the theory of decreasing returns to labour would imply.

An alternative specification and interpretation of equation (viii) can be obtained by a linear transformation of the permanent components in (viii):

$$((m_6+m_7)/(m_6+m_7-m_{10}))q_{-1} + (m_7/(m_6+m_7-m_{10}))(w-p)-(q-em))_{-1}$$

In this form the last term measures the long-run effect of changes in real unit labour costs so that long-run employment growth can be analysed in terms of changes in output and the share of profits.

A serious shortcoming of the above specification is that we have entirely ignored the influence of the capital stock and technical progress. Generally, the proper treatment of the capital stock and technical progress in labour demand equations poses a problem. On the one hand, when starting from a long-run labour demand equation it is clearly inappropriate to leave out the capital stock, and for the same reason the impact of technical progress cannot be "relegated" to a trend term. On the other hand, reliable capital stock data are rarely available and the effect of technical progress on aggregate employment depends on its nature as well as on the proportions of demand and price-constrained firms. An additional problem is that capital stocks in most countries tend to grow along a relatively stable trend, which makes it difficult to identify the coefficient.[4]

As a compromise we added a time trend to equation (viii) once an appropriate lag structure had been found. This is clearly an ad hoc solution and the time trend was actually insignificant in all four cases.

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4 This probably explains why most empirical estimates of the aggregate employment equation do not include freely estimated parameters for the capital stock. For instance, Bean et al. impose cross-equation as well as other constraints on the capital stock and technical progress variables, and in the estimates by Newell and Symons the capital stock coefficient is constrained to be unity, while the impact of technical progress is estimated freely.

B. Wage equations

The wage equation was selected using a simplified version of the model proposed by Davidson et al. (1978), which may also be interpreted as a test of the real wage hypothesis against the augmented Phillips curve equation. A key feature of the real wage hypothesis is that it postulates a long-run relation between the level of nominal (or real) wages and the level of unemployment. The Phillips curve equation, on the other hand, postulates a relationship between changes in nominal wages and the level of unemployment, which under certain conditions may involve a long-run relationship between changes in the rate of change of real wages and the level of unemployment.

Since the development in nominal wages is most likely to be dominated by the employees' side of the bargaining process, we have used a bargaining model as a point of departure, with the employees' target being set as a rise in their real earnings of R % per year.[5] If it is further assumed that a high rate of unemployment has a negative effect on nominal wages, reflecting either a temporary departure from the target or increased resistance by employers, a general wage equation may be written as:

$$(ix) \qquad W/PC = H\, e^{RT}\, U^{-b}$$

where PC is consumer prices, U is the rate of unemployment and T is time. This general relation is unlikely to be found in annual or quarterly data, but a testable form may be obtained by assuming lags of up to two years in W and PC and of one year in U.[6] Moreover, by taking logs (indicated by small letters) and leaving out time subscripts on current values, equation (ix) may be written as:

$$(x) \quad w = h + RT - b_1 u - b_2 u_{-1} + a_1 pc + a_2 pc_{-1} + a_3 pc_{-2} + a_4 w_{-1} + a_5 w_{-2}$$

---

5 In most versions of the real wage hypothesis the target variable is real after-tax earnings. However, due to lack of data for the entire sample period, the estimates reported in the text are based on pre-tax earnings. Moreover, even though employers are likely to target earnings rather than compensations, the latter has been used as the dependent variable.

6 The rate of unemployment is usually considered to be a lagged indicator of economic activity, which justifies the one-year lag on U.

which can be reparametrised as:

$$(xi)\ dw = h + RT - b_1u - b_2u_{-1} + a_1dpc - a_3dpc_{-1} - a_5dw_{-1} - (a_1+a_2+a_3)(w-pc)_{-1} + (a_1+a_2+a_3+a_4+a_5-1)w_{-1}$$

with R, b_1, a_1, $(a_1 + a_2 + a_3)$ and $(\Sigma a_i - 1) \geq 0$ and b_2, a_3 and $a_5 \gtrless 0$. Taking equation (xi) as the most general form of the data-generating process, a "testing down" procedure can now be applied in testing the validity of more specific models and assumptions.

Nominal vs. real wage targets: If the coefficient on w_{-1} is significantly different from zero, the long-run elasticity of nominal wages with respect to prices differs from unity and a solution in terms of real earnings is not feasible. A simple t-test of the coefficient on w_{-1} is sufficient to settle this issue and in all four cases a nominal target could be rejected.

Levels vs. rates of change: When the coefficient on w_{-1} is insignificant, the most crucial test concerns the coefficient on $(w-pc)_{-1}$. When w_{-1} and $(w-p)_{-1}$ both have an insignificant influence, the parameters satisfy the following restrictions:

$$a_1 + a_2 = -a_3 \quad \text{and}$$
$$a_4 - 1 = -a_5$$

which are also the restrictions required to have w and p only in first differences.[7] Again a simple t-test is sufficient to settle the issue and the second step of the search procedure concerned the significance and the sign of $(a_1+a_2+a_3)$.

Productivity vs. trend: When wage earners attempt to maintain their share of total factor income, the long-run real earnings target is set in terms of labour productivity growth and not as a constant time

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7 Most Phillips curve models include one or more restrictions in addition to the two explained above. Thus the trend term is usually left out as the intercept captures a trend in a first-difference equation. Moreover, one of the unemployment terms may be suppressed, although a number of recent studies have included both current and lagged values to test for hysteresis effects.

trend. Ignoring differential changes in output and consumer prices, a long-run elasticity of real earnings with respect to productivity of unity would leave factor shares constant, whereas an elasticity higher than unity (because of overambitious wage targets) tends to generate inflationary pressures. In the short run productivity changes are likely to influence nominal wage developments through two additional channels. In the first place, the existence of piece-work earnings systems together with fluctuations in overtime will create a direct and positive relationship between output per employee and nominal wages. Secondly, labour hoarding will lend a pro-cyclical pattern to productivity growth. Essentially this implies that the rate of unemployment is an incomplete indicator of labour market slack and the inclusion of productivity changes as an additional variable may correct this bias.

Going back to equation (ix), a productivity target enters the equation in the following way:

$$(xi) \qquad W/PC = H\ PR^{e}\ U^{-b}$$

Taking logs and assuming a time lag of up to two years, equation (xi) will have the following additional terms:

$$e_1 dpr - e_3 dpr_{-1} + (e_1 + e_2 + e_3)pr_{-1}$$

while the trend term drops out. In three of the four cases the productivity target was found to be more data-consistent than the simple trend.

Inflation neutrality: When the coefficient on w_{-1} is non-significant while that on $(w\text{-}pc)_{-1}$ is significant and of the correct sign, the steady-state solution can be written as:

$$(xii) \qquad W/PC = H'\ U^{-(b_1 + b_2)/A_e}(RT + (a_1 - a_3)dp - (1 + a_5)dw)/A$$

with $A = a_1 + a_2 + a_3$. A long-run solution independent of the rate of inflation (inflation neutrality) requires the additional restriction:

$$a_1 - a_3 = 1 + a_5.$$

One way of testing this restriction is to go back to equation (xi) without the term in w_{-1}, impose a homogeneity condition with respect to nominal changes, and estimate the equation as:[8]

$$(xiii)\quad ddw = a_1 ddpc - (a_5 + 1)(dw - dpc)_{-1} - (a_1 + a_2 + a_3)(w-pc)_{-1} + h' - b_1 u - b_2 u_{-1} + RT$$

This test was not performed, but judging from the unrestricted coefficients and the associated standard errors, the two wage equations for Taiwan satisfy the neutrality condition, whereas South Korean wage earners appear to claim wage increases which exceed the short-term inflation rate.

(C) Price model

A large number of recent pricing models are essentially mark-up functions, based on the assumption that most firms face a downward sloping demand curve and can set their own prices. However, a major hypothesis to be tested in this paper is that this ability may be subject to constraints and that the most likely source of such constraints is the influence of foreign competition.

From a theoretical point of view the influence of foreign prices should be estimated using separate models for tradable and non-tradable goods, but because of well-known problems in selecting the corresponding sectors this approach has not been followed. Nonetheless, the model applied may be explained by taking the Scandinavian Model of Inflation as a point of departure. Thus for goods sold on the domestic market firms are assumed to set prices (PD) so as to maintain a constant long-run income share:

$$(xv)\quad PD = K\, CAP^a ULC$$

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8 A corresponding equation can be derived for the version with the productivity target, and, when the coefficients on both w_{-1} and $(w-pc)_{-1}$ are insignificant, the inflation neutrality test is also valid. Thus the case of money illusion may be tested by making the first-difference equation homogeneous in nominal changes:

$$(xiv)\quad dw = h' - b_1 u - b_2 u_{-1} + a_1 dpc - a_3 dpc_{-1} + (1 - a_1 + a_3) dw_{-1}.$$

Compared with the unconstrained first-difference equation this involves only one additional restriction ($-a_5 = 1 - a_1 + a_3$), which is the same as the one given above.

where ULC is actual unit labour costs, K is a mark-up factor and CAP is a cyclical variable measured so as to equal 1 over a full cycle.

Since firms' mark-ups may not be based on actual but on normalised ULC, or on some weighted average of the two, the above specification could lead to biased coefficients. Nonetheless, given the rather uncertain empirical evidence on this point, equation (xv) was adopted as the basic equation and alternative measures of productivity and ULC were not tested on a systematic basis but only when equation (xv) produced implausible coefficients. It should also be noted that due to lack of data equation (xv) excludes measures of capital costs.

Turning to goods sold abroad, we adopted a model usually applied to small price-taking countries:

$$PX = \overline{XR}.\overline{PW,X} \qquad \text{(xvi)}$$

where PX is the export deflator measured in the domestic currency, $\bar{\bar{XR}}$ is the effective export-weighted exchange rate and $\bar{\bar{PX}},\bar{W}$ represents world market prices of exports. The bars indicate exogenous variables and this model actually assumes that domestic export prices are entirely exogenous.

Denoting the output shares of domestically sold and exported goods by ε and $1-\varepsilon$ respectively, the equation obtained for the value added deflator (P) is:

$$P = K^{\varepsilon}CAP^{\varepsilon\alpha}ULC^{\varepsilon}PX^{1-\varepsilon} \qquad \text{(xvii)}$$

In this form P is assumed to be homogeneous of degree one with respect to ULC and PX, but in implementing the equation a general lag structure of up to two years was adopted, which also allowed testing of the homogeneity condition. Using logs, this general approach can be written as:

$$p_t = a_0 + a_1 cap_t + a_2 cap_{t-1} + b_1 ulc + b_2 ulc_{t-1} + b_3 ulc_{t-2} + c_1 px_t + c_2 px_{t-1} + c_3 px_{t-2} + e_1 p_{t-1} + e_2 p_{t-2} \qquad \text{(xviii)}$$

or

$$dp_t = a_0 + a_1 cap_t + a_2 cap_{t-1} + b_1 dulc_t - b_3 dulc_{t-1} + c_1 dpx_t - c_3 dpx_{t-1} - e_2 dp_{t-1} + \Sigma b_i (ulc/p)_{t-1} + \Sigma c_i (px/p)_{t-1} + (\Sigma b_i + \Sigma c_i + \Sigma e_i - 1) p_{t-1}$$

with b_1, c_1, Σb_i and $\Sigma c_i \geq 0$ and a_0, a_1, a_2, b_3, c_3, e_2 and $(\Sigma b_i + \Sigma c_i + \Sigma e_i - 1) \lesseqgtr 0$. This was initially estimated with all the current and lagged terms, but subsequently reduced to include only significant variables.

Since equation (xviii) is estimated with dp as the dependent variable it may be compared with traditional price equations estimated in first differences, and in considering short to medium-term policy implications this would also be the appropriate perspective to use, since the level terms change very slowly. However, precisely because of the level terms the long-run properties can be used in selecting the appropriate form. These characteristics are most evident from the steady-state solution:

$$(xiv) \quad P = CAP^{\Sigma a/f} ULC^{\Sigma b/f} PX^{\Sigma c/f} e^{((b_1-b_3)dulc + (c_1-c_3)dpx - (1 + e_2)dp)}$$

where $f = 1-\Sigma e$. From this expression two characteristics are immediately obvious:

- P is only homogeneous with respect to ULC and PX when $f = \Sigma b + \Sigma c$, or when the coefficient of P_{-1} is not significantly different from zero. By contrast, when the coefficient of P_{-1} is positive (negative) the long-run trend of P will tend to exceed (fall short of) the weighted average of ULC and PX;

- the long-run solution of P is only neutral with respect to the rate of inflation when the coefficients of the exponent sum to zero. In the case of only one-year lags this condition simplifies to $b_1+c_1-e_2 = 1$, which is often imposed in traditional first-difference price equations. In virtually all of the results reported in the text it was found that $(b_1-b_3) + (c_1-c_3) \approx 1+e_2$, implying that higher or lower rates of inflation had virtually no effect on the long-run trend of P relative to those of ULC and PX, and this was the case regardless of whether the coefficient of P_{-1} was positive or negative.

- the coefficient of CAP is mainly relevant in evaluating the cyclical behaviour of prices and in most cases a pro-cyclical pattern was found. When the coefficient on P_{-1} is significantly positive the coefficient with respect to CAP can also be used to derive a rate of capacity utilisation which ensures a long-run constant distribution of

factor income.[9] Thus, disregarding the exponent and setting ULC = PX = P_{-1}, the long-run solution may be written as:

(xv) $$P_t = CAP^{\Sigma a} P_{t-1}^{1+f'}$$

where f' is the estimated coefficient with respect to P_{-1}. Hence when f' is positive a distribution-neutral trend for P requires that the rate of capacity utilisation be kept below 100, with the necessary degree of slack being proportional to $f'/\Sigma a$.

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9 Sneesens and Dreze (1986) derive a similar concept.

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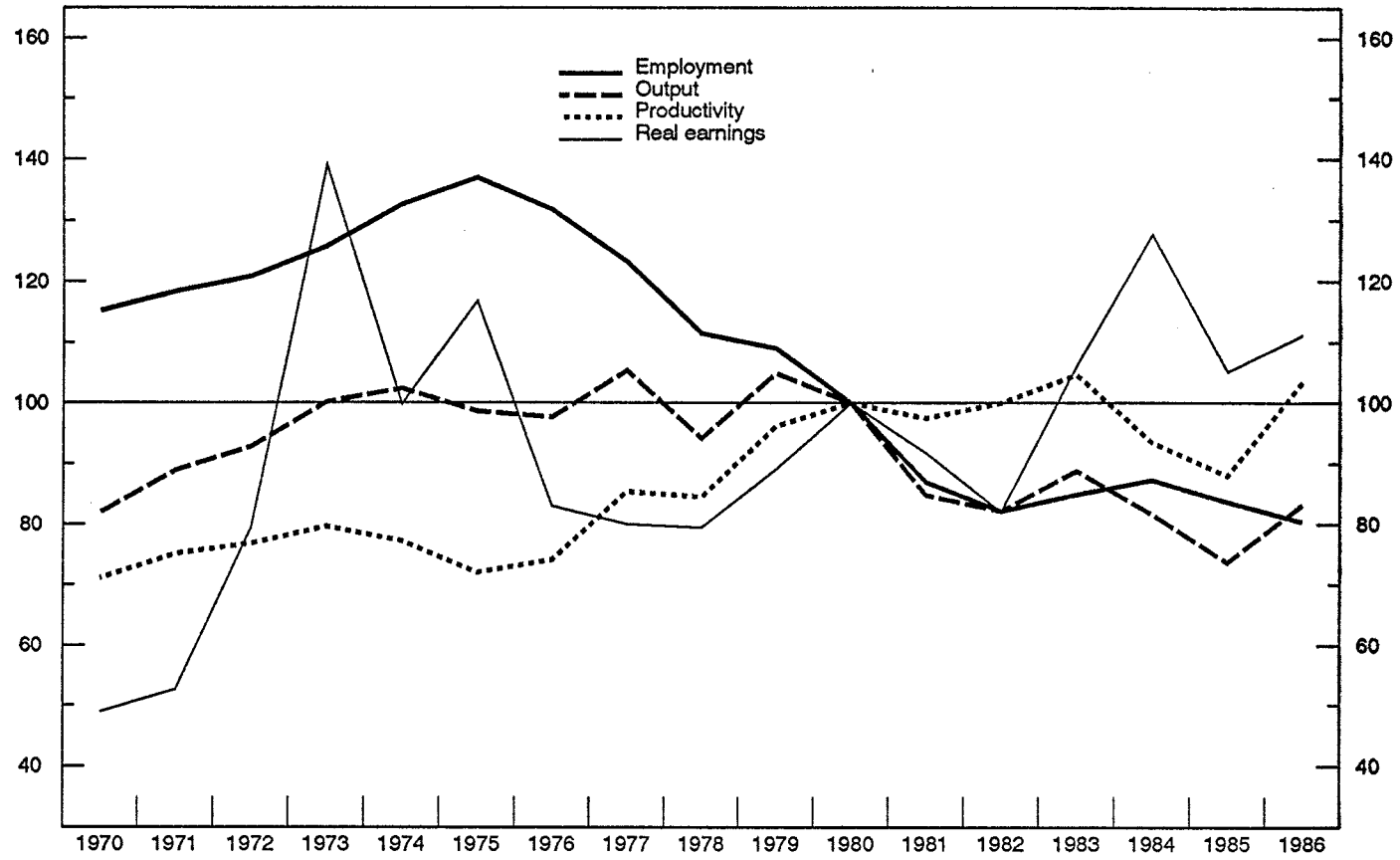
ANNEX B

Developments in employment, output, productivity and real earnings:
Manufacturing sector

Developments in employment, output, productivity and real earnings: Argentina
(in manufacturing; indices, 1980 = 100)



Developments in employment, output, productivity and real earnings: Bolivia
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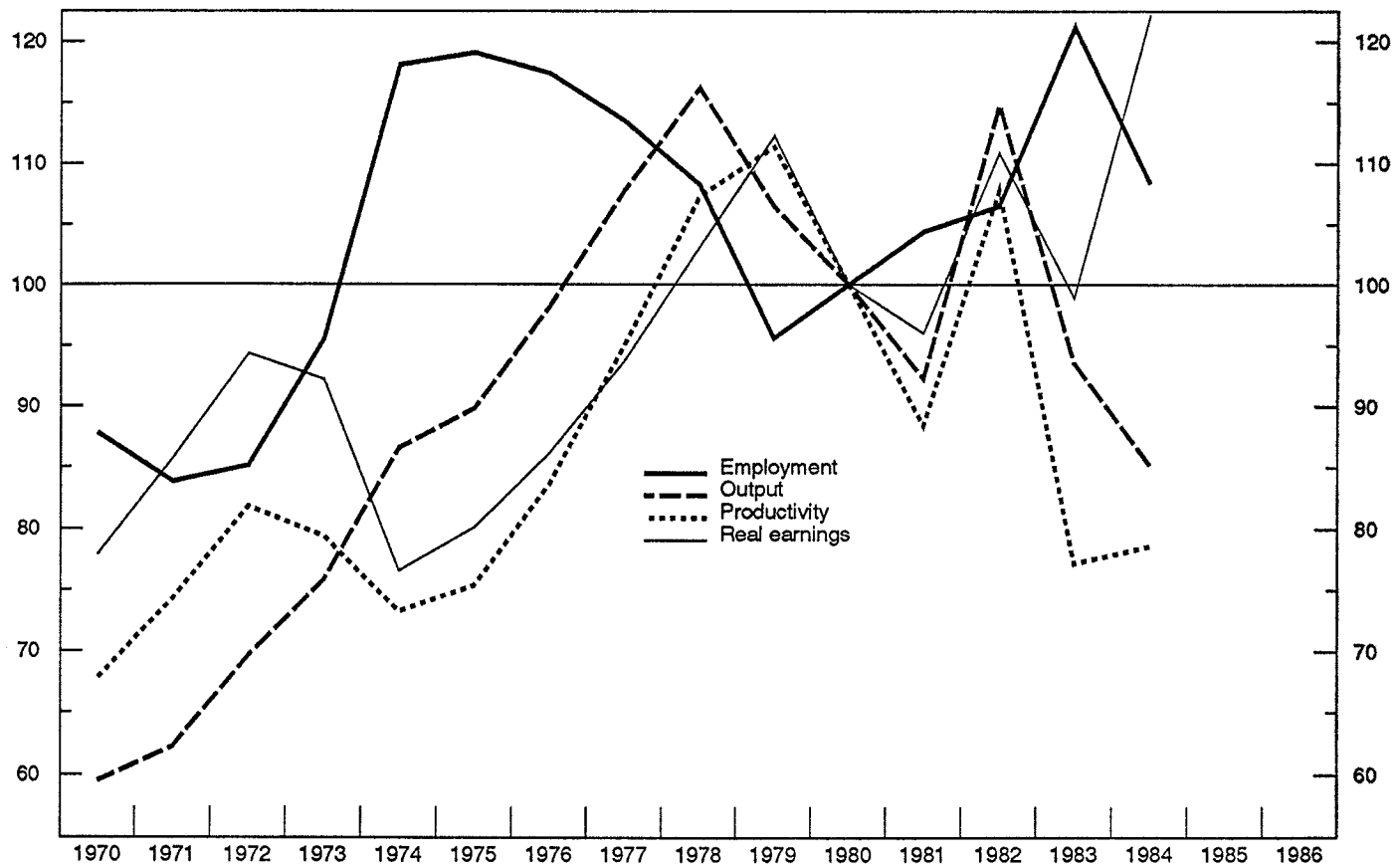

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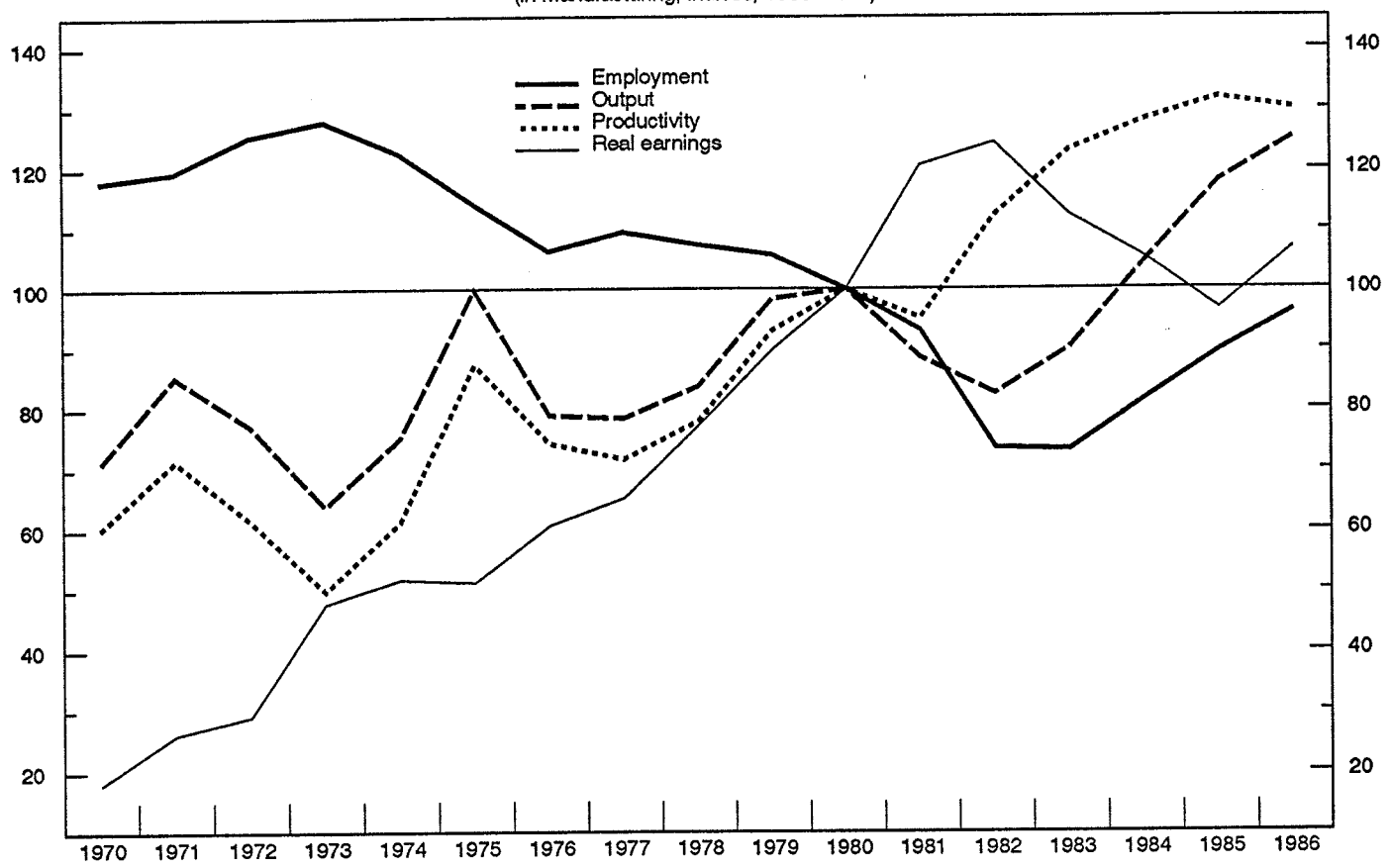

Developments in employment, output, productivity and real earnings: Colombia
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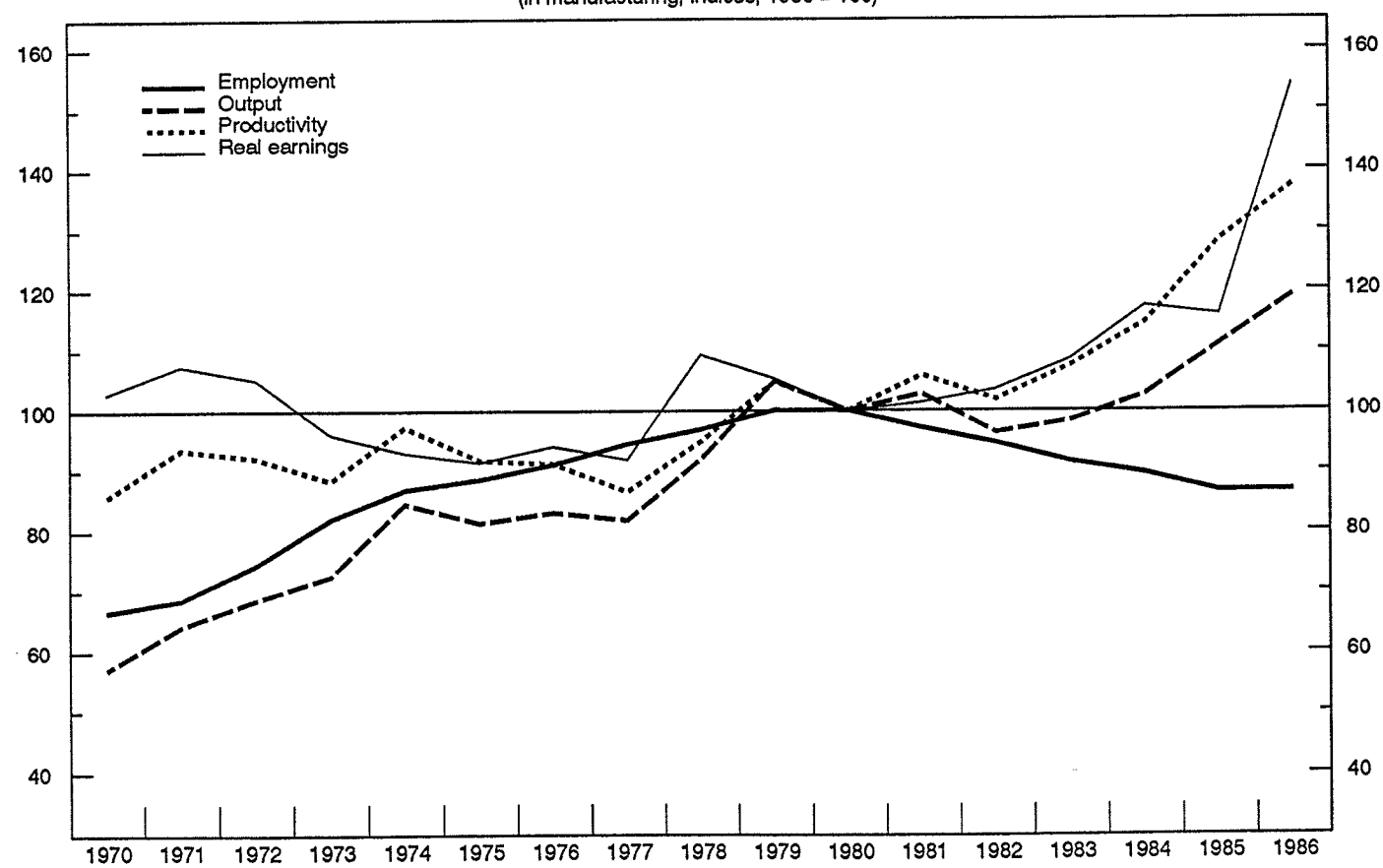

Developments in employment, output, productivity and real earnings: Ecuador
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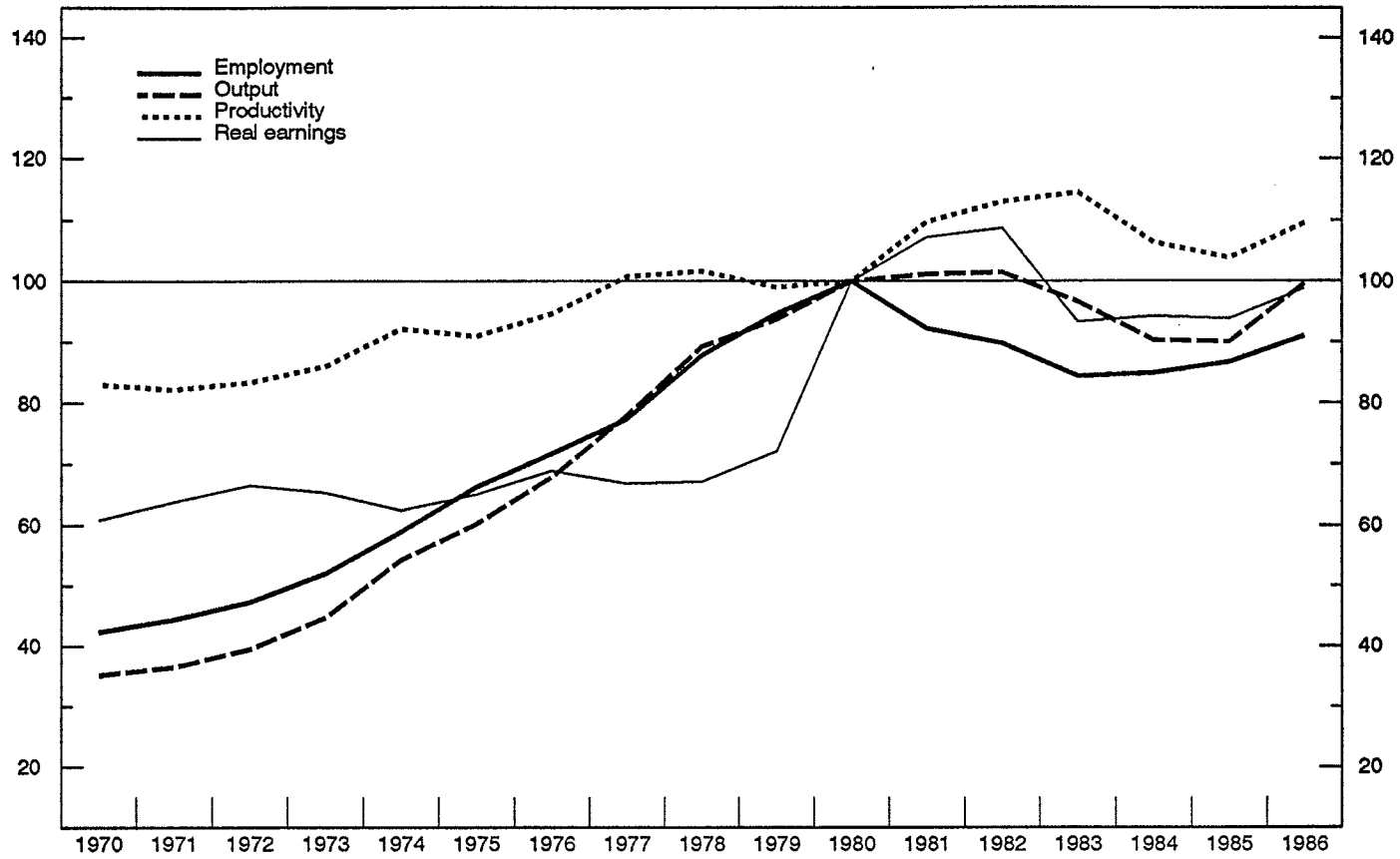

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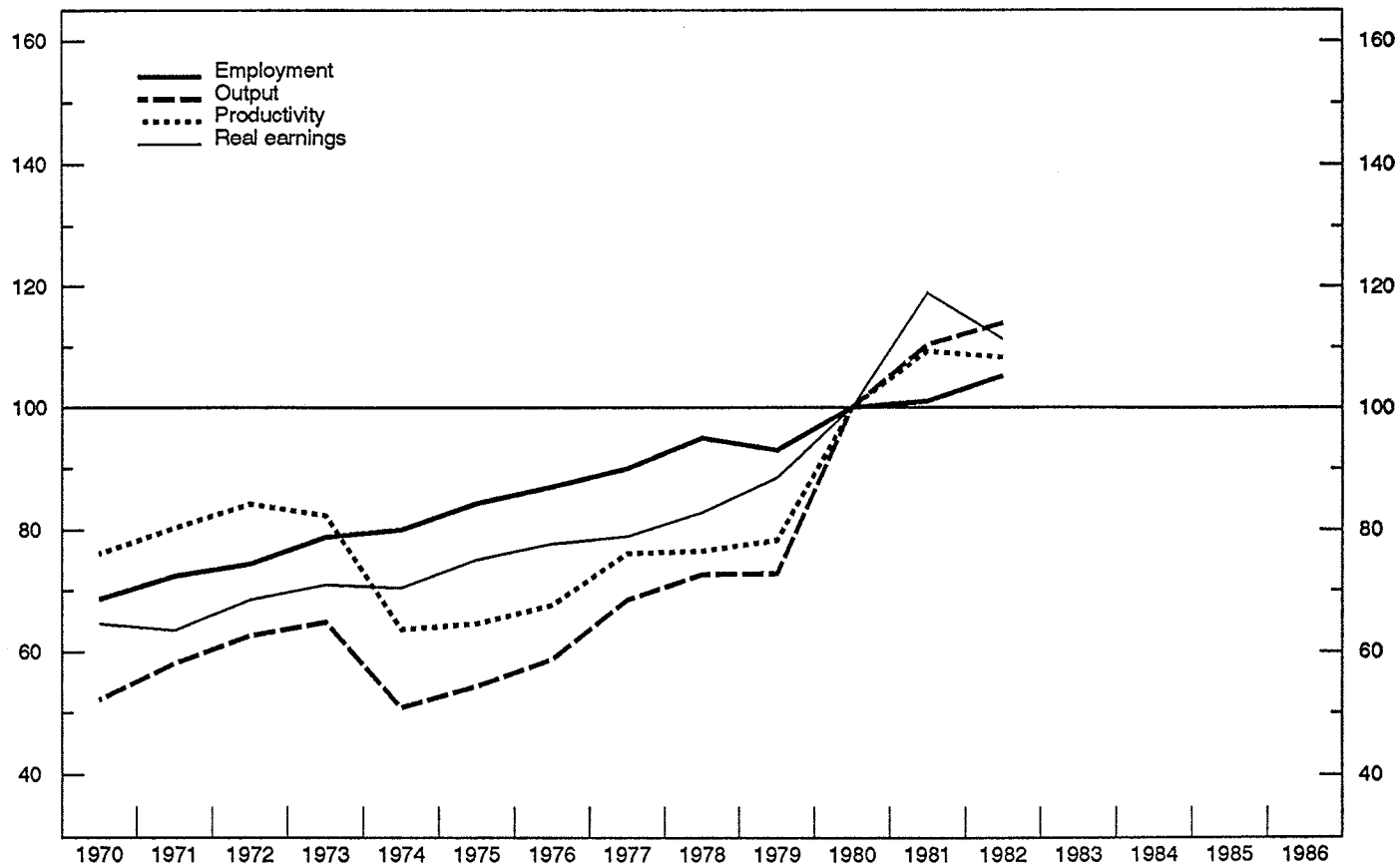

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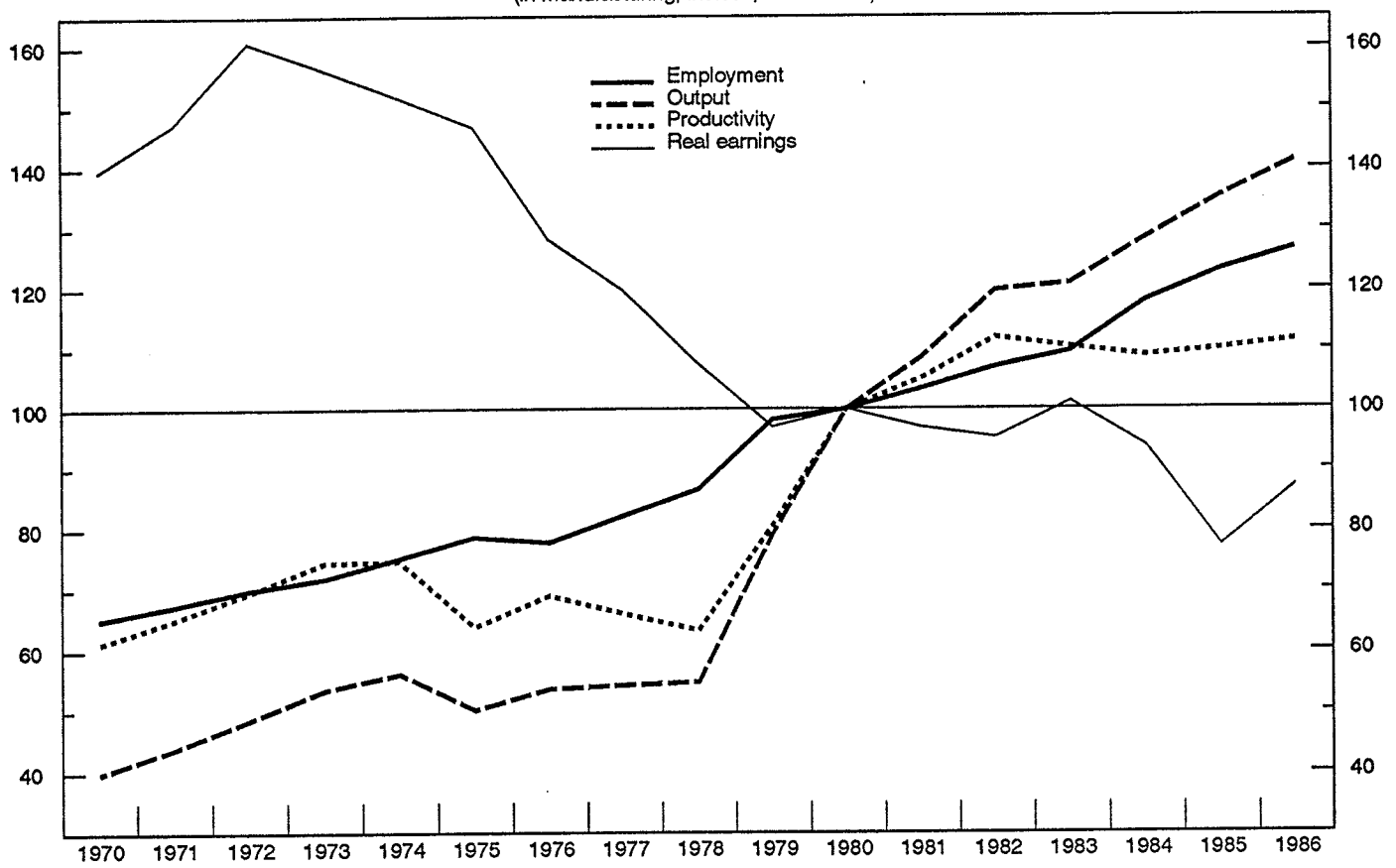

Developments in employment, output, productivity and real earnings: Ghana
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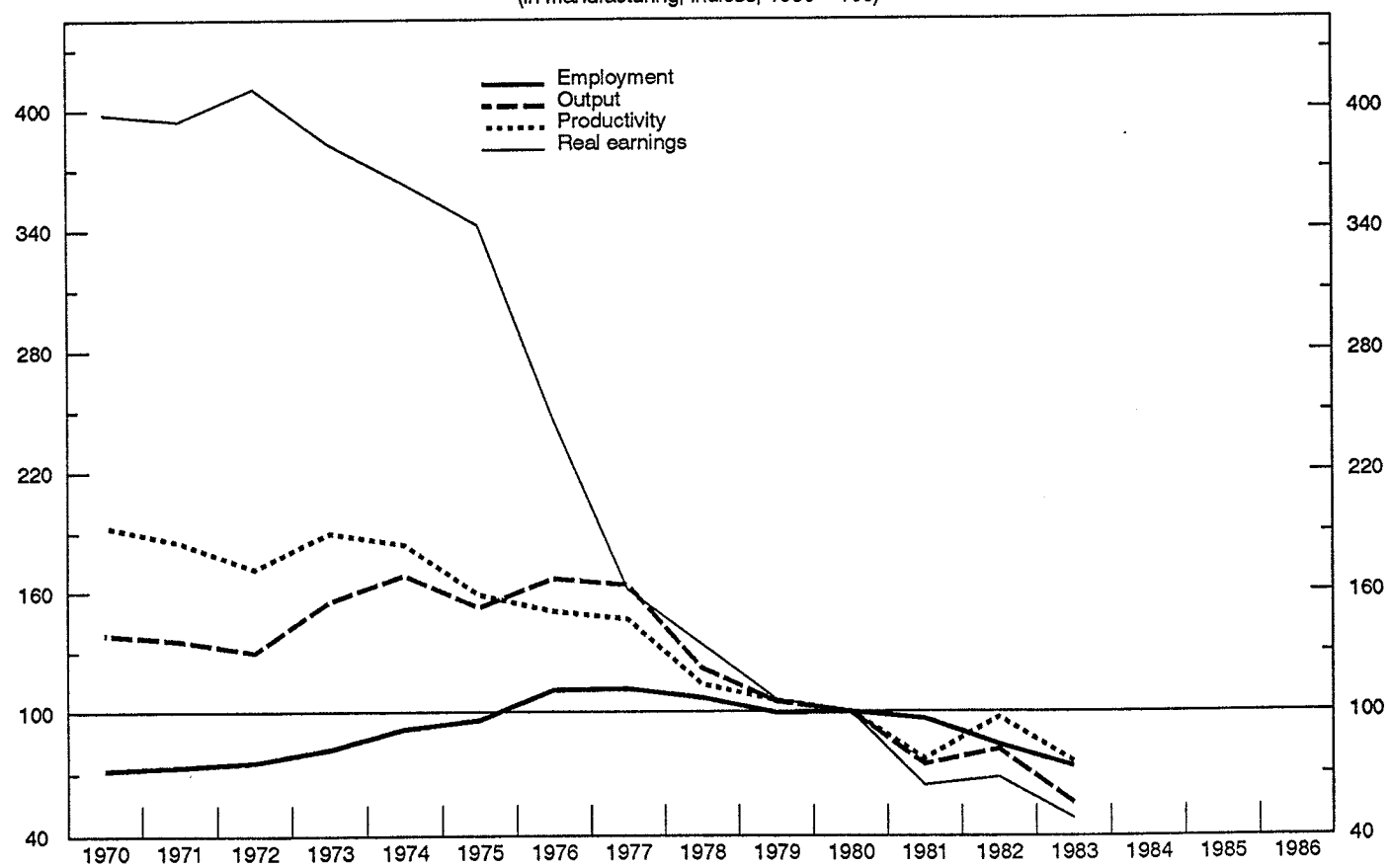

Developments in employment, output, productivity and real earnings: India
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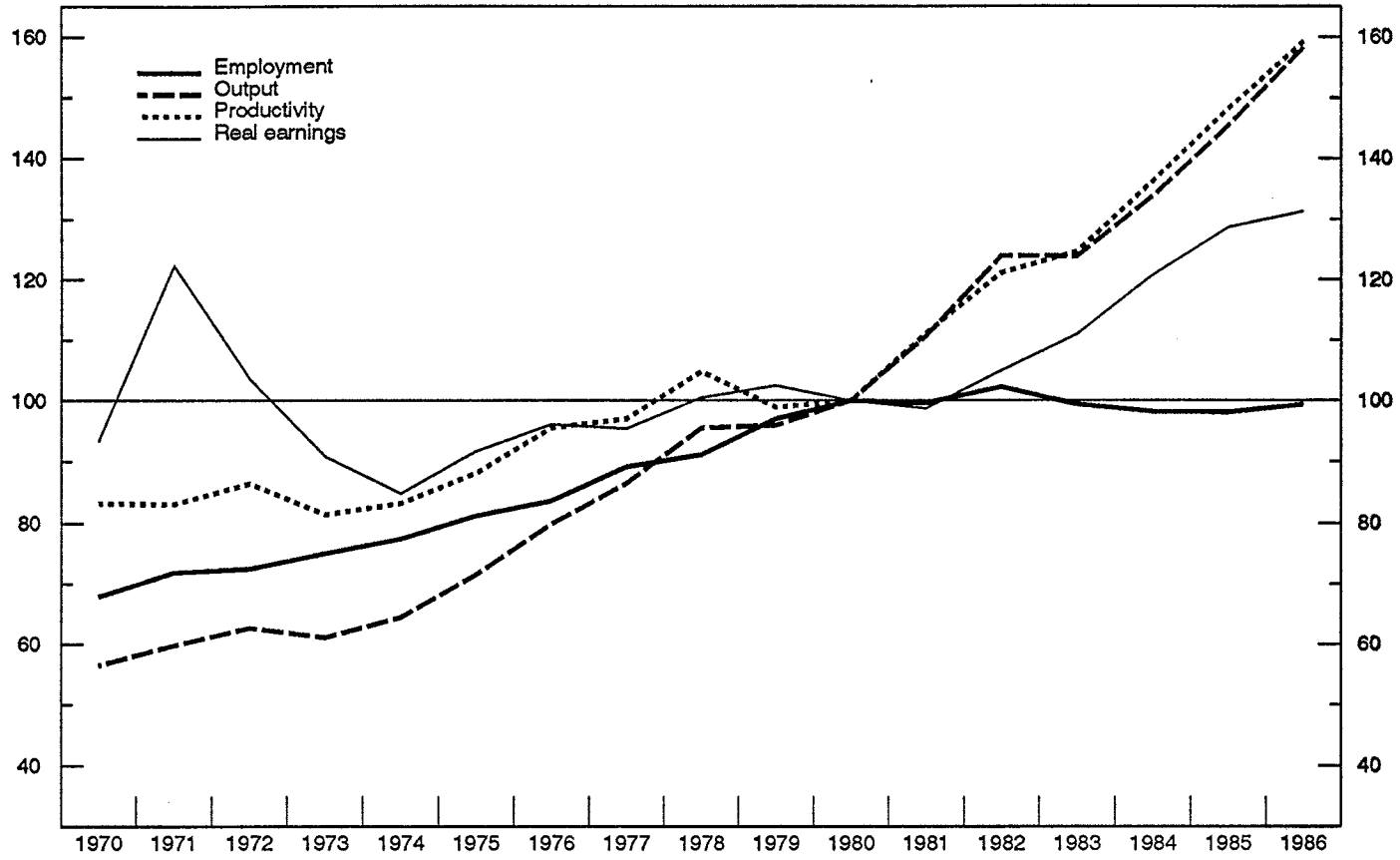

Developments in employment, output, productivity and real earnings: Indonesia
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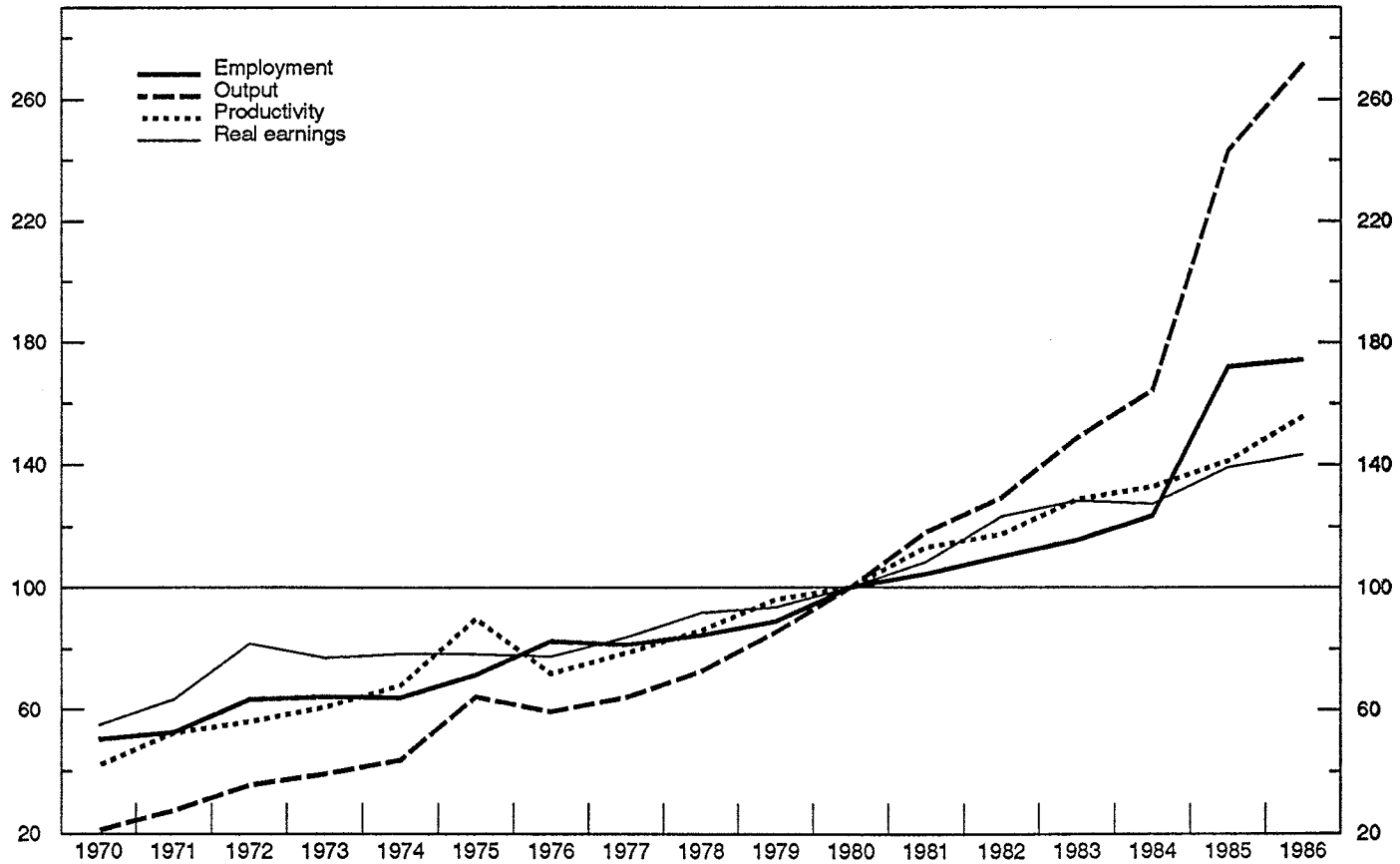

Developments in employment, output, productivity and real earnings: Kenya
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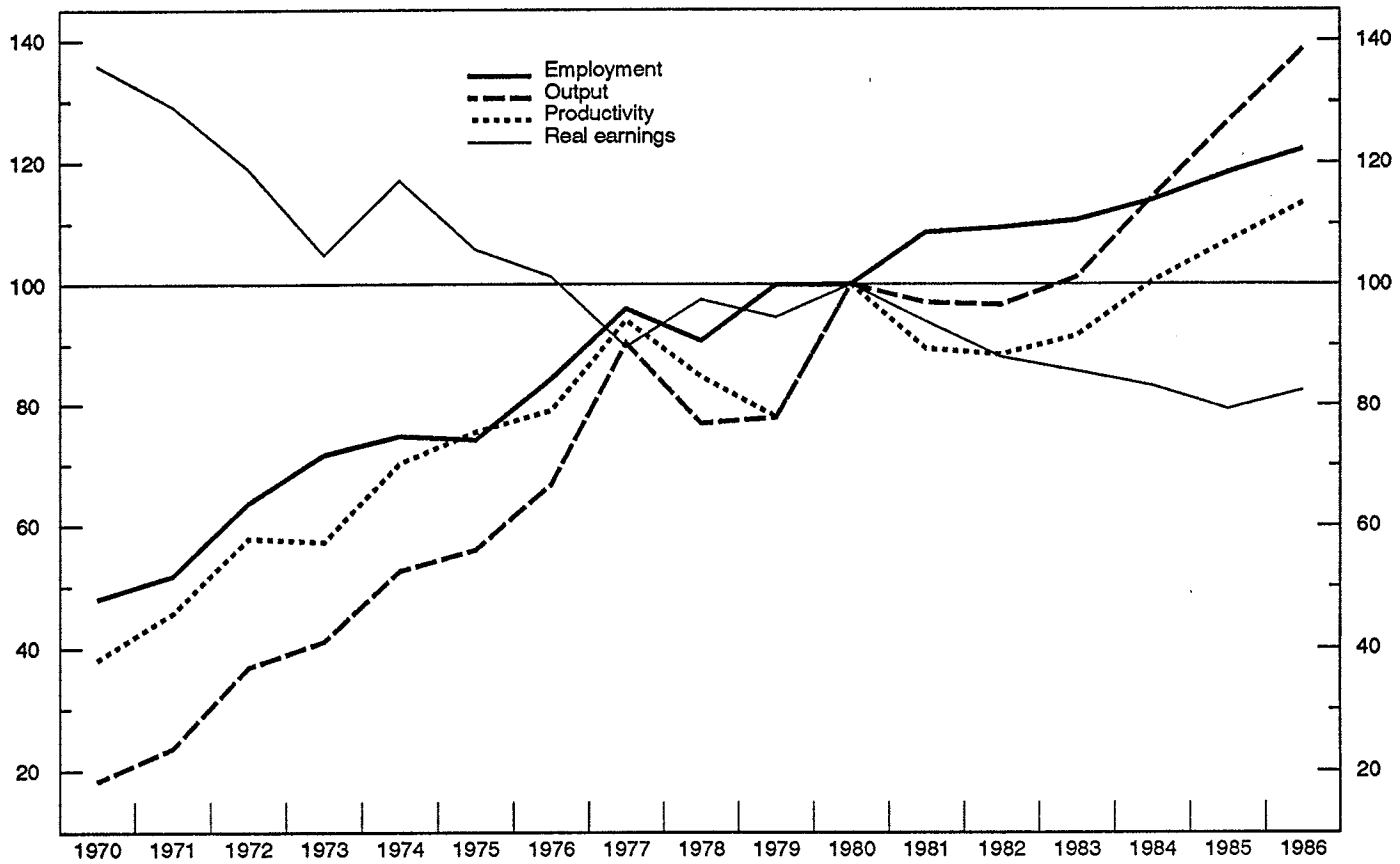

Developments in employment, output, productivity and real earnings: Malawi
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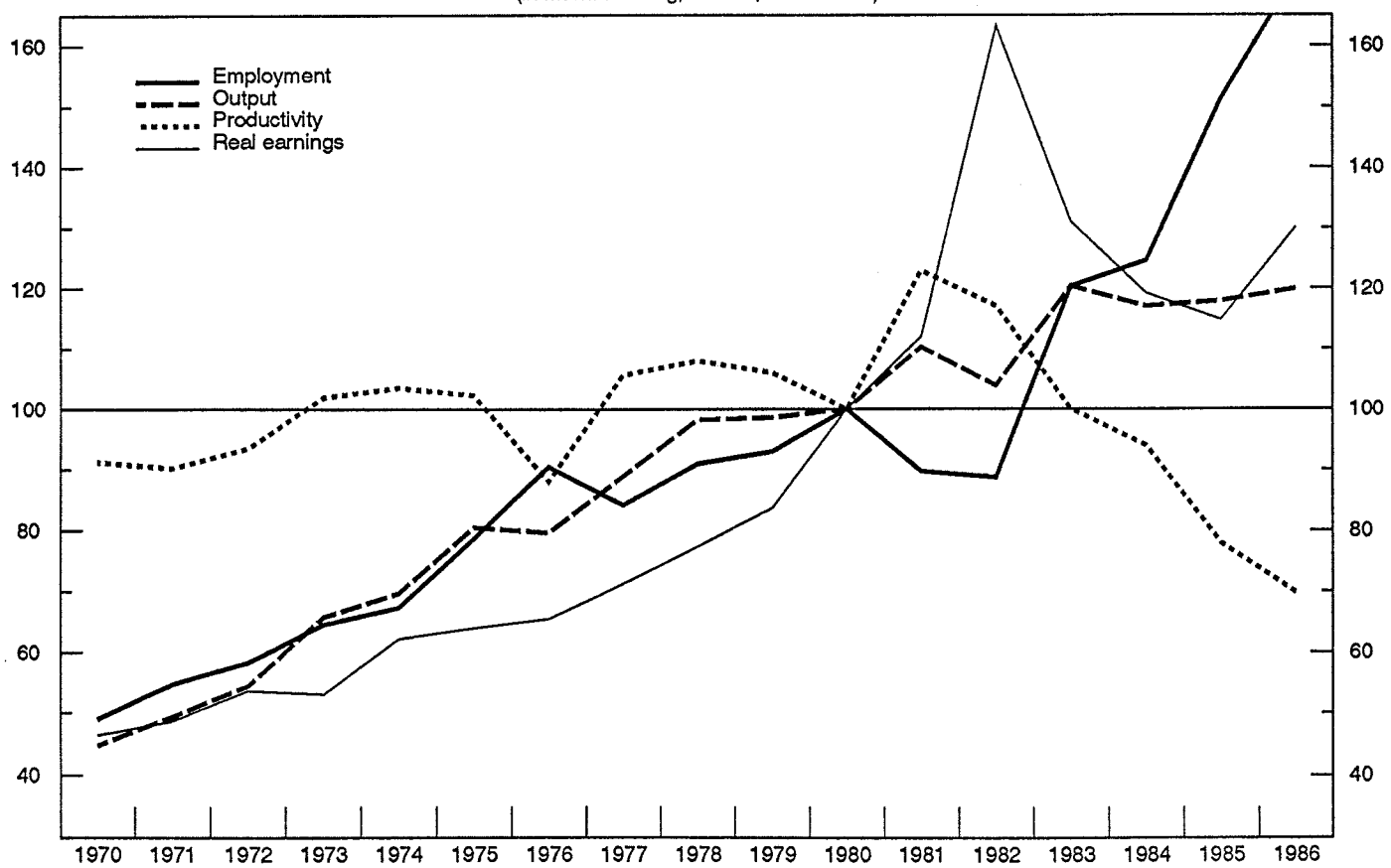

Developments in employment, output, productivity and real earnings: Malaysia
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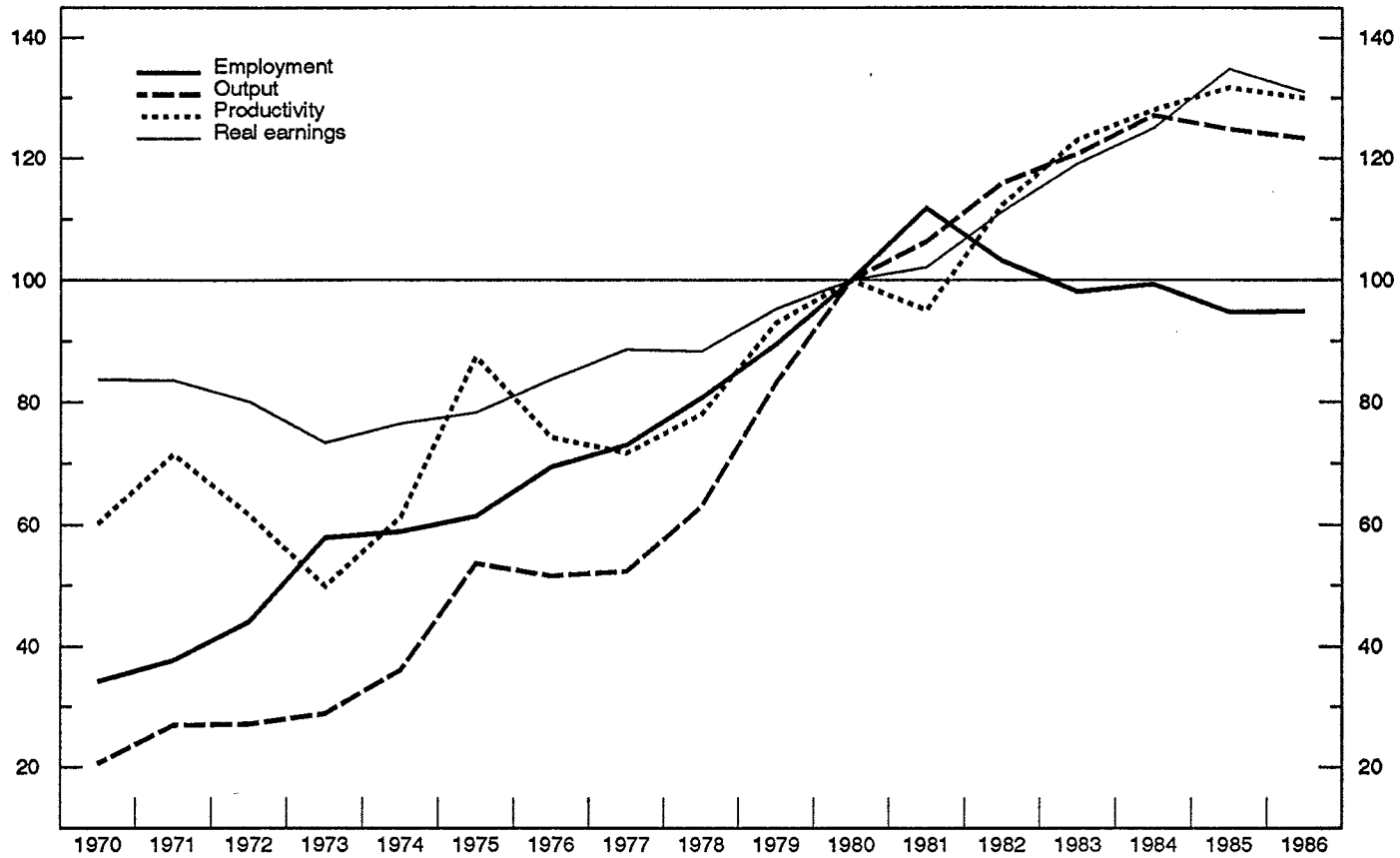
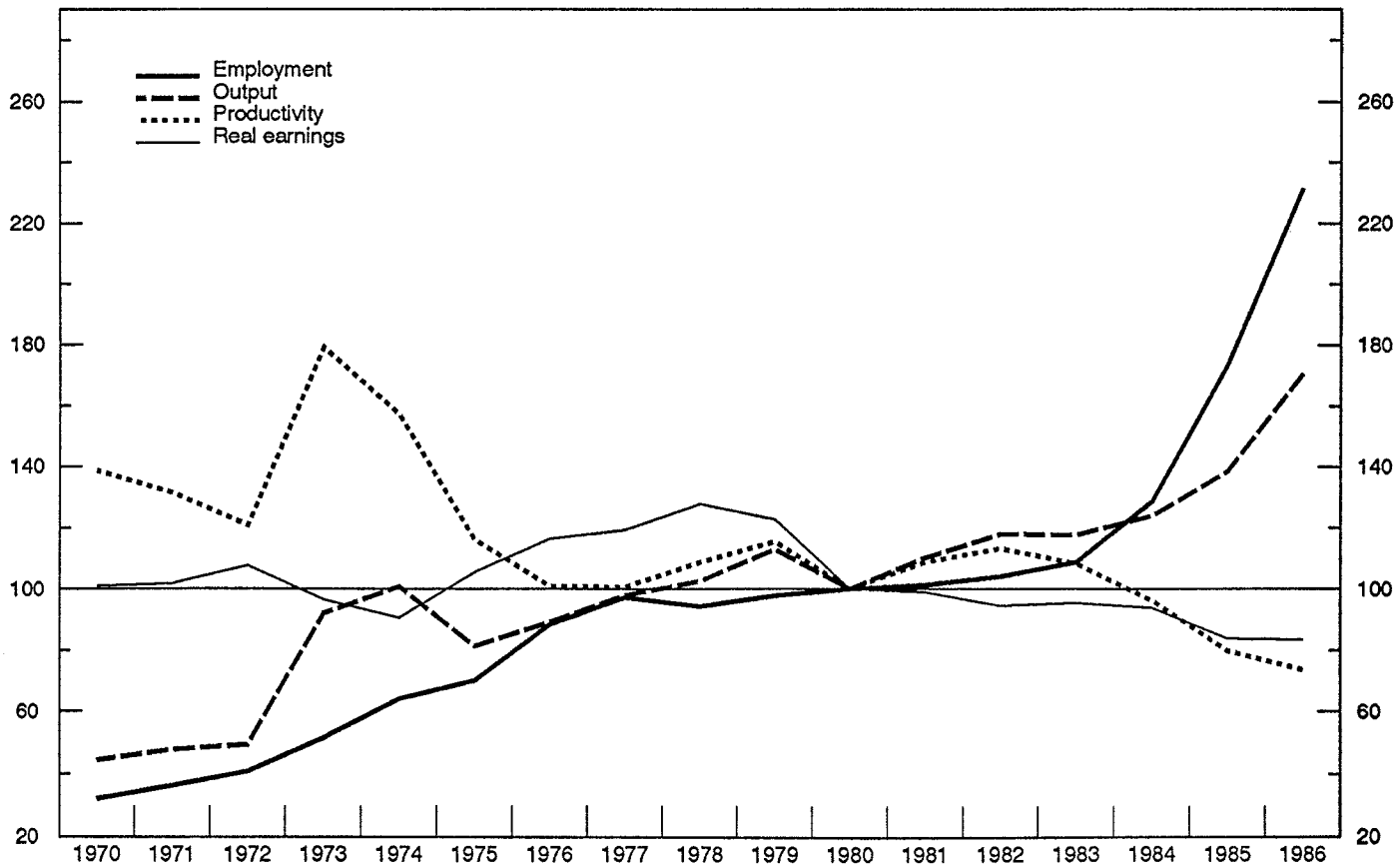
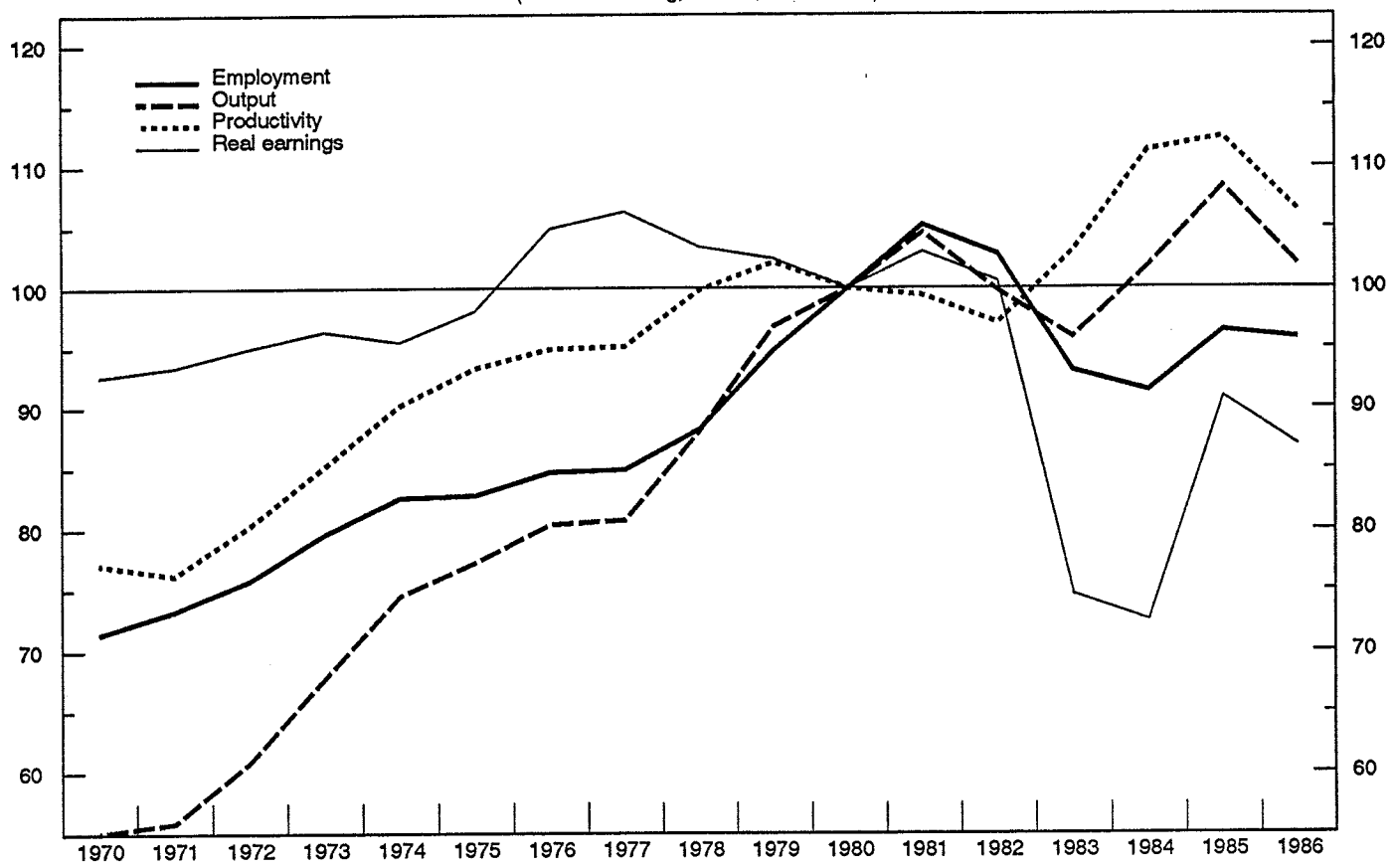


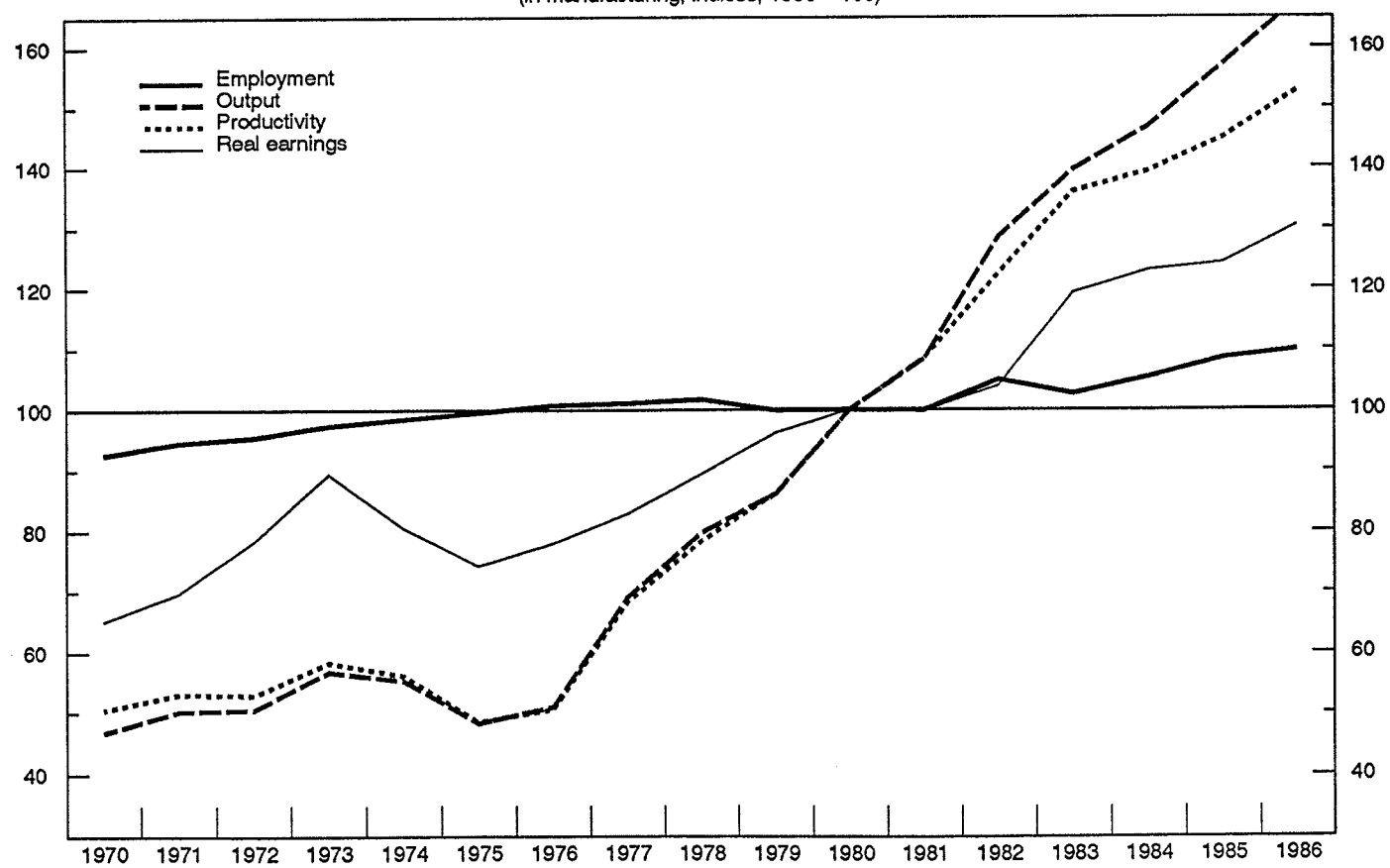
Developments in employment, output, productivity and real earnings: Mauritius
(in manufacturing; indices, 1980 = 100)



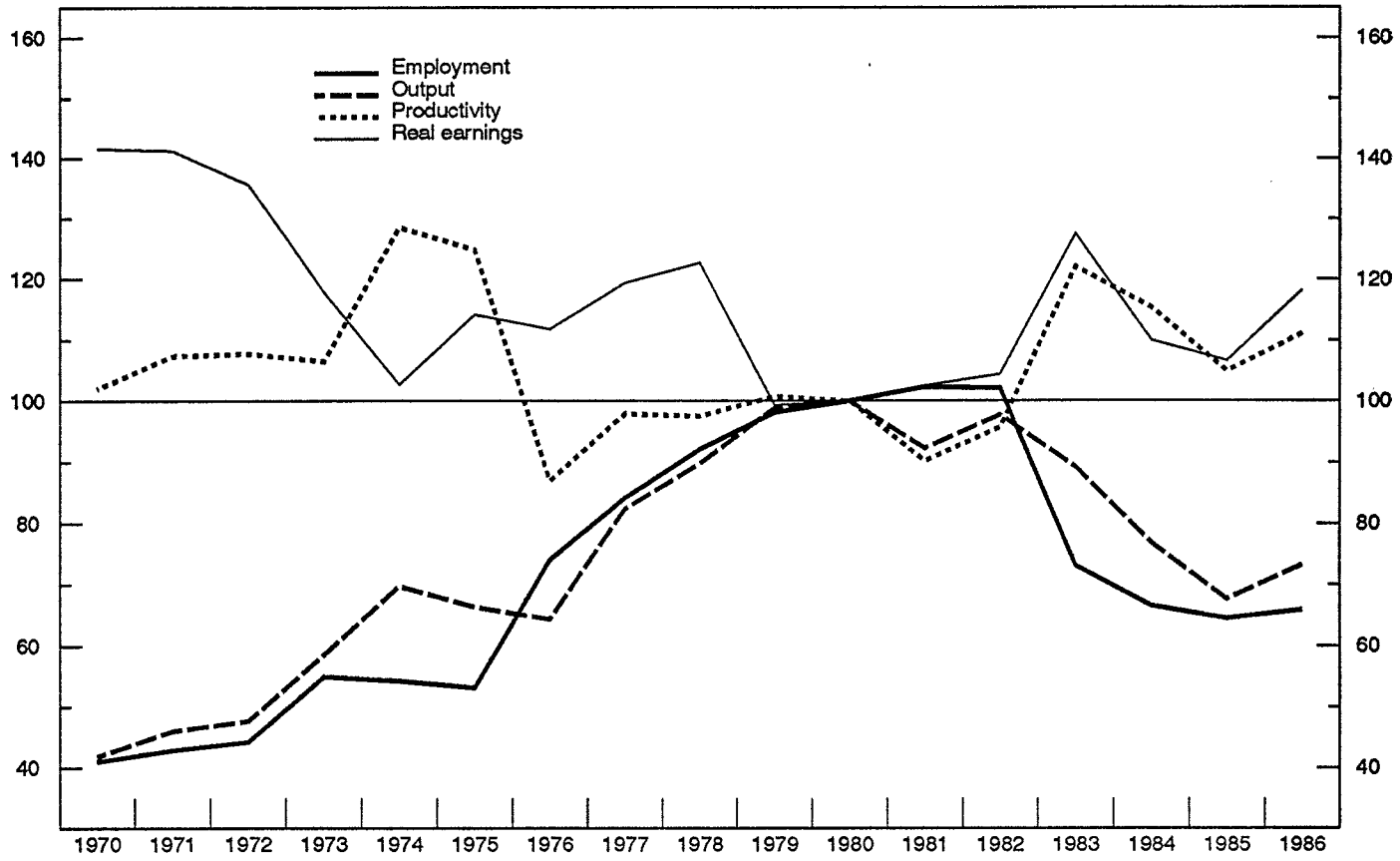
Developments in employment, output, productivity and real earnings: Mexico
(in manufacturing; indices, 1980 = 100)



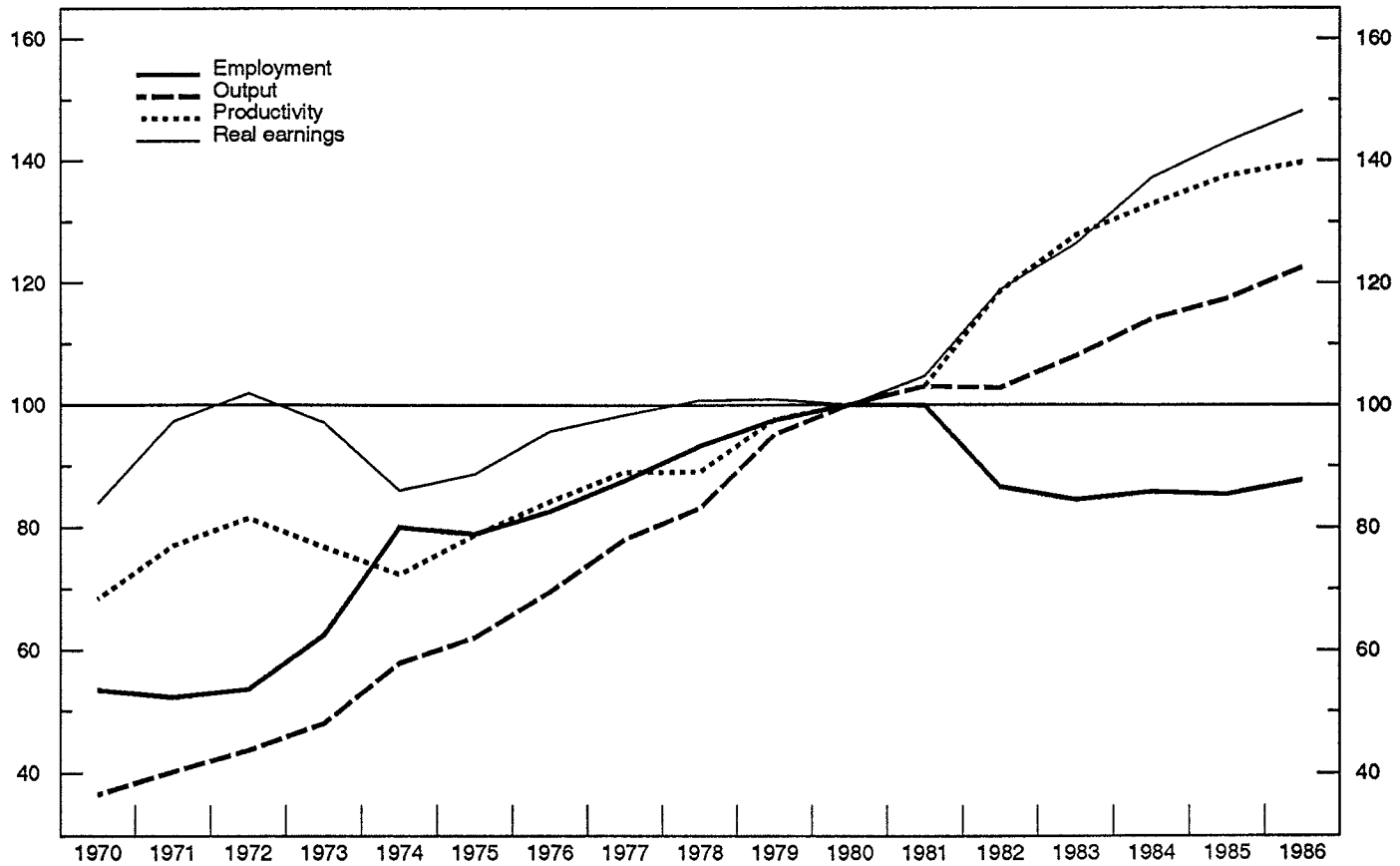
Developments in employment, output, productivity and real earnings: Pakistan
(in manufacturing; indices, 1980 = 100)



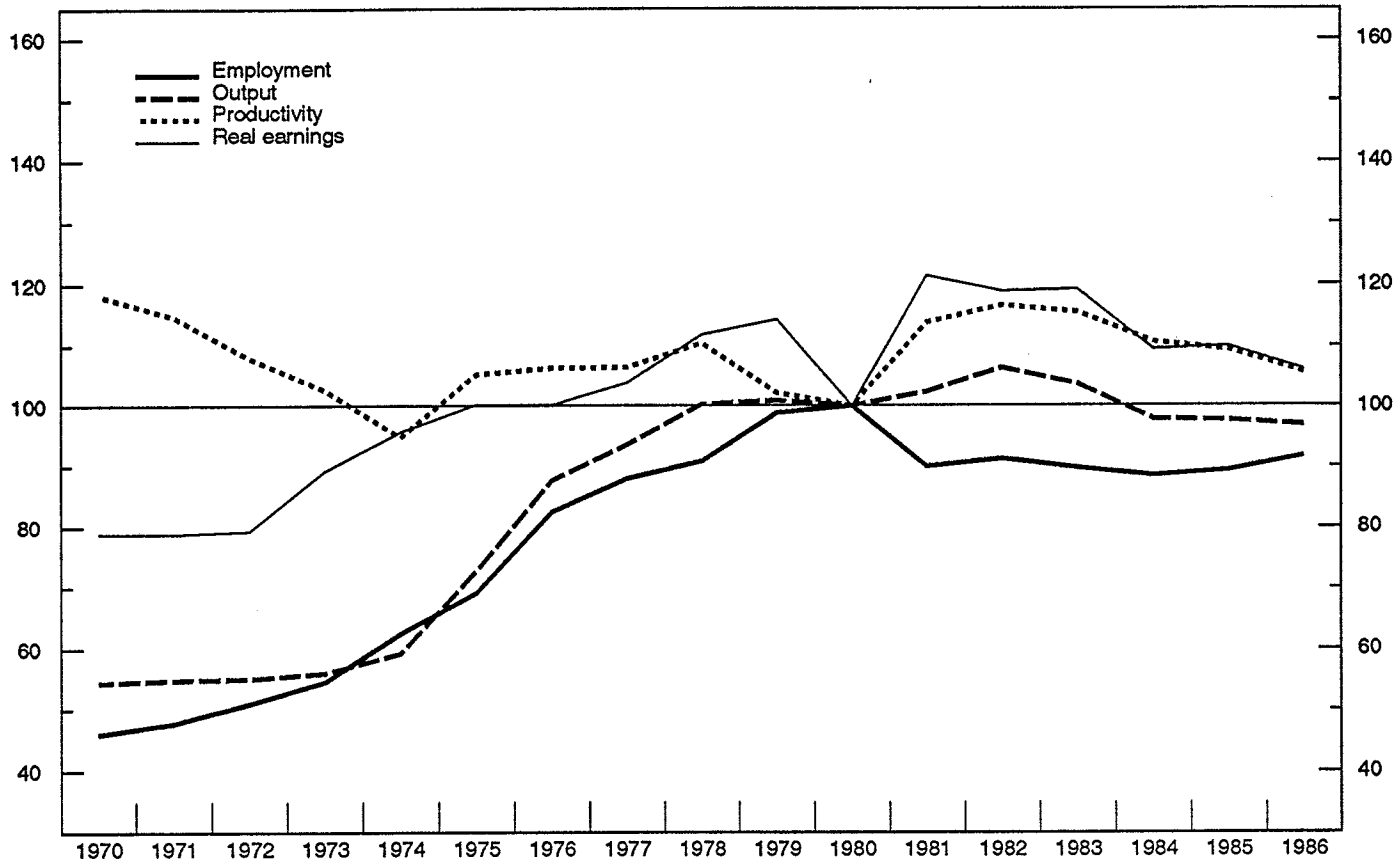
Developments in employment, output, productivity and real earnings: Philippines
(in manufacturing; indices, 1980 = 100)



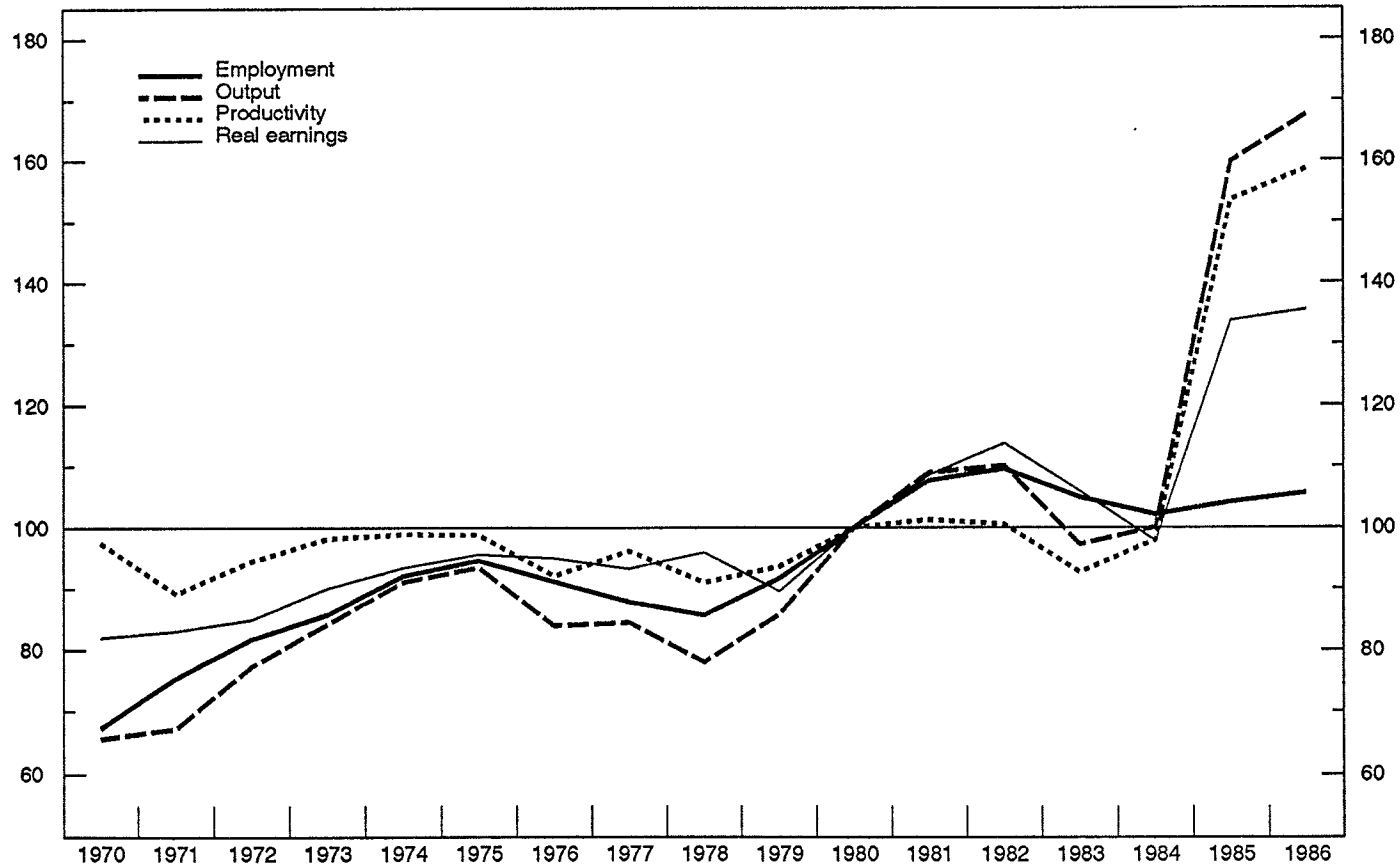
Developments in employment, output, productivity and real earnings: Thailand
(in manufacturing; indices, 1980 = 100)



Developments in employment, output, productivity and real earnings: Venezuela
(in manufacturing; indices, 1980 = 100)



Developments in employment, output, productivity and real earnings: Zimbabwe
(in manufacturing; indices, 1980 = 100)



Developments in employment, output, productivity and real earnings: Uruguay
(in manufacturing; indices, 1980 = 100)