Unemployment in Kenya: Some economic factors affecting wage employment

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Abstract

This article analyses the economic factors affecting wage employment in Kenya, where open unemployment fell from 15 per cent in 1998/1999 to 13 per cent in 2005/2006. As of 2005/2006, wage employment constituted 13 per cent of the total working population, which implies that doubling wage employment will absorb idle labour and help solve unemployment in Kenya. The results of this study indicate that increasing economic output alone will not guarantee higher wage employment. The key to higher wage employment in Kenya would be to improve broader levels of socio-economic development with a view to increasing the value of Kenya's exports, and keeping domestic inflation low.

Keywords: demand for labour, natural rate of unemployment, terms of trade

1   Introduction

A high rate of unemployment is one difficulty in managing an economy. Theory proposes the existence of a natural rate of unemployment, where the deviation of actual unemployment from this rate has economic consequences. There will be high and accelerating inflation if actual unemployment falls below the natural rate of unemployment and decelerating inflation, and possibly deflation, if actual unemployment rises above the natural rate (Krugman, 1994). Stable inflation is arguably indicative of actual unemployment at/near the natural rate of unemployment (Krugman, 1994; Blanchard, 2006). The natural rate of unemployment posits a level of unemployment constituting that part of the labour force that remains unemployed after the labour market has cleared (i.e., when aggregate demand for labour equals the aggregate supply of labour at the prevailing real wage rate). Unemployed labour includes those who are between jobs (frictional unemployment) and those who cannot find jobs or are unwilling to work at the prevailing wages (structural unemployment). Frictional unemployment is associated with imperfect information in the labour market, whereas the structural component of unemployment is associated with institutions in the labour market, demographics and preferences. Lowering the natural rate of unemployment therefore entails improving information on job vacancies, having appropriate labour laws that do not distort the pricing of labour services or constrain the mobility of labour, and avoiding welfare/taxation systems that reduce the opportunity cost of not working. Aside from structural and

frictional unemployment (the supply side of the labour market) there is also the cyclical component of unemployment, associated with changes in aggregate demand (Krugman, 1994).

Following Keynes (1936), the link between employment and effective aggregate demand is analysed through interactions between investment, production and income (including returns on investment). Ideally, an increase in aggregate demand will lead to an increase in production sales, which will increase income(s) payable to producers. As the returns to production increase, producers will be motivated to increase investment and expand production, which will entail an increase in the demand for labour at the prevailing wage rate. Employment will increase until no further benefit can be derived from raising the levels of production owing to associated increases in wage costs to the producer. A positive second-round effect of higher employment on effective demand will come from an increase in actual consumption expenditure. However, Keynes (Ibid) points out that an increase in income will not proportionately increase actual consumption expenditure. If the propensity to consume is low, raising incomes will have a minor effect on consumption expenditure and employment. It therefore follows that an increase in savings will dampen effective demand, investment and employment. The effect of increased effective demand on consumer prices is also considered, given that producers have the option of increasing the price of their output in order to clear excess demand for their products.

There is no consensus in empirical literature on the demand-side factors that cause high and persistent rates of unemployment across countries. Explanations advanced touch on the rate of investment, the expected returns from production and the level of economic activity. Unemployment has been associated negatively with gross domestic product (GDP) growth; rate of investment; growth in total factor productivity; skill levels; industry profitability and terms of trade, and positively with real interest rates; monetary and fiscal tightness and nominal shocks (Bruno, 1985; Bean, 1994; Blanchard & Wolfers, 2000; Fabiani *et al.*, 2000; Peng, Cheung & Fan, 2001; Fan, 2004; Wälde & Weiss, 2006; Chen 2011).

Evidence on the effect of capital expansion on the demand for labour is mixed, with some authors finding a minimal effect (Peng, Cheung & Fan, 2001; Fang, 2004) and others finding significant positive effects (Karanassou, Sala & Salvador, 2007). Contrasting arguments are, on one hand, that a fall in interest rates will increase the rate of investment in capital, which will in turn increase the demand for labour. On the other hand, an increase in the ratio of capital-to-labour in the production process will increase the productivity of labour and motivate demand for higher wages. As the cost of labour rises, firms will seek to economise on labour and will cut back on their demand for labour (Blanchard, 2006). Moreover, investment could be increased to intensify the use of capital in the production process and limit the use of labour. According to theory, firms base decisions on whether to invest more in capital on both the cost of investing in such capital (including the real interest rate) and the

expected profitability of using additional capital. The profitability of production is influenced by the price of commodities. Smith and Zoega (2008) argue that although the profitability of production may positively influence the demand for labour, how the domestic labour market responds to changes in the rate of investment in capital will be influenced by labour market institutions.

There is also debate on the supply-side causes of high and persistent rates of unemployment, particularly on the role of labour market institutions in determining unemployment. Some authors argue there is a limited role for institutions in interacting with economic shocks to produce unemployment (Nickell, Nunziata & Ochel, 2005). Nickell, Nunziata and Ochel (Ibid) note that changes in labour laws and payroll taxes affected unemployment in 20 Organisation for Economic Co-operation and Development (OECD) countries, and that employment protection makes unemployment more persistent. They found no significant impact on unemployment from the manner in which these economies react to shocks, given existing labour market institutions. Other authors argue that labour market institutions introduce rigidities into the labour market which restrict the adjustment of real wages to economic shocks (Bean, 1994; Krugman, 1994; Blanchard & Wolfers, 2000; Fabiani *et al.,* 2000). For instance, Krugman (1994) points out that the association between productivity growth and unemployment may be weakened by welfare systems so that it may not necessary be the case that productivity growth would lower unemployment. Comparative analyses of labour markets across Europe have identified a persistence mechanism most likely attributable to the behaviour of the unemployed and labour market institutions[1] through higher wages and generous welfare payouts (Bean, 1994; Krugman, 1994; Morgan & Mourougane, 2001). Labour market institutions are thought to affect the labour costs facing firms, the bargaining power of workers, and the job search habits of the unemployed through such arrangements as employment protection and unemployment insurance (Blanchard, 2006). In contrast, persistent unemployment in the United States (US) has been found to be due to cyclical factors (e.g., industry profitability) as opposed to structural factors (Chen *et al.,* 2011).

The concept of the natural rate of unemployment is useful in studying the problem of the Kenyan labour market clearing at low levels of employment. Empirical studies suggest that Kenya grapples more with structural unemployment wherein workers are willing to work but either cannot find work or cannot meet the skill requirements for advertised jobs. Among the supply-side factors identified as contributing to the high rate of unemployment in Kenya are a fast-growing labour force; rural–urban migration; rapid expansion in school enrolments; inappropriate skills among job seekers; imperfect labour market information flow that leads to skills mismatch; job selectiveness; low wages (from the point of view of the worker) and urban poverty. On the demand side, factors thought to explain unemployment are low economic growth rate; weak labour absorptive capacity of the economy and failure to develop

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1   This covers unemployment benefits, payroll taxes, minimum wage, trade union density and job mismatch.

areas with greater employment potential; seasonality of certain industries; lack of access to self-employment opportunities; shortage of land; adoption of capital-intensive technology; adoption of labour-saving technology owing to high wages and salaries (from the point of view of the employer); imports; and the structural adjustment programmes of the 1980s (Odhiambo & Manda, 2003; Wambugu, Munga & Onsomu, 2009; Omolo, 2012).

Kenya's population has grown steadily since the 1970s, with its composition skewing towards persons below the age of 30. In contrast, real economic growth has been on a downward trend, despite stints of rapid growth. The net effect of a faster-growing population relative to real economic growth is declining employment elasticity (or employment intensity of growth), which is the change in employment due to a change in GDP. Omolo (2012, p. 10) reports estimates of employment elasticities for Kenya declining from 1.8 (1996–2000) to 0.5 (2004–2008). Notwithstanding declining economic growth rates, the choice of technology has also worked to reduce the positive effects of growth on employment. This argument introduces the role of wages in determining the demand for labour, wherein rising wages relative to labour productivity growth are associated with higher demand for capital goods relative to the demand for labour. The rising cost of labour in Kenya has been attributed to labour market institutions, particularly statutory minimum wages and trade unions (Manda, 2002; Wambugu, Munga & Onsomu, 2009). Upward revisions to minimum wage and other statutory benefits amidst declining labour productivity are argued to have suppressed the demand for labour. International aspects discussed by Manda (2002) further suggest that increased foreign competition through cheap imports has negatively affected the profitability of small businesses and, therefore, the demand for labour. Manda (Ibid) argues that cross-border trade in goods and services was liberalised without resolving the domestic capacity constraints – occasioned mainly by poor infrastructure, these are responsible for the comparatively high production costs in Kenya.

The contributory role of rural–urban migration in explaining unemployment in Kenya is documented in Odhiambo and Manda (2003). A key result of Kenya's rural–urban migration is urban poverty. The urban poor are predisposed to supplying labour to the market for lack of capital assets. Evidence of this is presented by Odhiambo and Manda (Ibid), whose estimates show that labour participation rates are higher in urban than in rural areas. Furthermore, due to limited access to education, the urban poor have low skill levels, which inhibit them from gaining formal employment. The working conditions urban workers are subjected to, also factor into discussions on their productivity. In the case of the export processing zones, for instance, Kindiki (2011) points out that poor wage and work conditions negatively impact the productivity of workers. Kindiki (Ibid, p. 32) cites limited job training; a lack of job security (in terms of regular hiring and firing 'on flimsy grounds'); actual wages below the statutory minimum wage; actual working hours in excess of the statutory maximum limit on the number of working hours per week;

overcrowding at work stations; a lack of sanitary facilities and a lack of protective gear for workers.

In recent years, growth in employment in the informal sector has surpassed employment growth in the formal sector. This is partly attributed to retrenchment in the public service under structural adjustment programmes (Manda, 2002; Wambugu, Munga & Onsomu, 2009). Omolo (2012) notes that deteriorating wages and work conditions as well as low productivity in the informal sector may indicate that the informal sector cannot sustainably absorb more labour. Pollin, Gĩthĩnji and Heintz (2008) also point out that incomes are much higher for workers in formal employment than for those in informal employment, owing to competition among the many existing informal household enterprises. Unemployment among the youth is attributed to their preference for formal jobs, and compounded by their difficulty in securing formal employment due to low skill levels and inexperience (Wambugu, Munga & Onsomu, 2009). The rising number of school dropouts entering the job market is worsening the problem of youth unemployment in Kenya.

Explanations for unemployment in Kenya include Godia (1987) arguing that education would not solve the problem, because employment is often determined by economic and social factors. For instance, the 8-4-4 system of education was introduced to produce a mix of skills – academic and technical – since the previous system was alleged to train for 'white-collar jobs', whereas the economy was not generating such jobs in sufficient quantities to absorb graduates. Even then, the supply of jobs for technicians remained low. Godia (Ibid) therefore proposed that greater efforts be made to develop the economy with a view to creating jobs. Pack (1977), who argues that poverty limits economic growth, disassociates labour productivity growth in Kenya from the use of capital-intensive technology. There is an interesting proposal in Kalecki (1943) for a more direct approach by government to increase aggregate demand and reduce unemployment. The approach involves increased government spending on either investment or subsidised private consumption, which would be financed by securitised debt and capital tax. Attempts by the Government of Kenya to solve the country's unemployment problem have included increased investment in education, agriculture, infrastructure and industry (including the informal sector); enhancing labour market information systems and gearing macroeconomic policy towards faster economic growth (Omolo, 2012). The aim of these initiatives is to reduce the number of those willing to work but who cannot find work, and to improve the demand side by increasing the economy's capacity to absorb more labour. High unemployment rates have persisted despite these efforts.

According to the population censuses of 1998/1999 and 2005/2006, the working-age population in Kenya rose from 15.9 million persons in 1998/1999 to 19.8 million in 2005/2006, the number of employed persons increased from 10.5 million to 12.7 million, while the number of unemployed persons rose from 1.8 million to 1.9 million (Central Bureau of Statistics, 2003 and 2008). In other words, the working-age

population increased by 22 per cent, the number of employed persons increased by 19 per cent and the number of unemployed by three per cent (1998/1999 to 2005/2006). The open unemployment rate therefore fell from 15 per cent in 1998/1999 to 13 per cent in 2005/2006. Coincidentally, during this period, wage employment rose by five per cent from 2.4 million persons (or 15% of the total working population) to 2.5 million (13% of the total working population). This implies that doubling wage employment in Kenya will absorb most of the idle labour and will help to resolve unemployment. This article, which analyses the economic factors affecting wage employment in Kenya, adds to the body of literature on unemployment in that country by appraising wage employment outcomes in six dominant economic activities, with reference to the determining factors mentioned in previous studies on unemployment in Kenya. The remainder of the article is structured as follows: the next section reviews trends in the various economic activities in Kenya in terms of output, wage employment and wage payments; thereafter the equations to be estimated are derived; the estimation results are then presented; followed by the conclusion and policy recommendations.

2   Trends in wage employment indicators for Kenya

The performance of the Kenyan economy declined between 1980 and 2000. Growth in real GDP declined from 6.0 per cent in 1981 to 0.5 per cent in 2000, but increased thereafter to peak at 7.0 per cent in 2007. The share of agriculture, forestry and fishing, financial intermediation, manufacturing, real estate, renting and business services and construction in GDP declined during 1980–2011. The average contribution of agriculture, forestry and fishing to real GDP was 24.8 per cent (2001–2011) compared with 29.6 per cent in 1980–2000, while the average contributions of manufacturing and financial intermediation to real GDP also declined from 13.2 per cent and 8.6 per cent, respectively (1980–2000) to 9.9 per cent and 4.0 per cent in 2001–2011 (see Table 1). The shares of real estate, renting and business services, construction and trade, restaurants and hotels in real GDP also declined, but by smaller margins of 2.1 per cent, 1.7 per cent and 0.5 per cent, respectively. The size of transport and communication, however, increased notably over the review period and was the second largest economic activity in Kenya as at 2011. The share of other services in GDP also increased by 11.7 per cent over the review period.

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**Table 1: Average percentage contribution to real GDP by economic activity**

Economic activity	1980–2000	2001–2011	Absolute change
Agriculture, forestry and fishing	29.6	24.8	-4.8
Trade, restaurants and hotels	11.4	10.9	-0.5
Transport, storage and communication	6.1	10.8	4.7
Manufacturing	13.2	9.9	-3.4
Real estate, renting and business services	7.7	5.6	-2.1
Financial intermediation	8.6	4.0	-4.5
Construction	4.8	3.2	-1.7
Electricity and water supply	1.8	2.2	0.4
Mining and quarrying	0.3	0.5	0.2
Other services	16.5	28.2	11.7

Source: *Statistical Abstract*, various issues, Kenya National Bureau of Statistics

The overall decline in economic performance in the period 1980–2000 was reflected in slowdowns in wage employment in manufacturing, construction, community, social and personal services, while employment in agriculture and forestry remained subdued in 2000–2011 (see Figure 1). Employment in transport and communication, and wholesale and retail trade somewhat weathered the storm in the earlier years, but caved around 2000 when economic growth was at its lowest. Thereafter, employment in community, social and personal services, wholesale and retail trade improved (i.e., post-2007), while employment in construction and transport and communication made the most robust recovery.

Although there has been an increase in total wage employment from an annual average of 1 197 116 from 1972–1979 to 2 511 164 from 2000–2011 (Table 2, panel a), growth in total recorded wage employment slowed significantly between the two periods. The overall slowdown in total wage employment was reflected across all other economic activities except mining and quarry, which registered increases in both its share in real GDP and growth in wage employment between 1980 and 2011. The slowing growth of manufacturing and its contribution to real GDP as well as the slowdown in wage employment in manufacturing have been attributed to increased competition from imports.
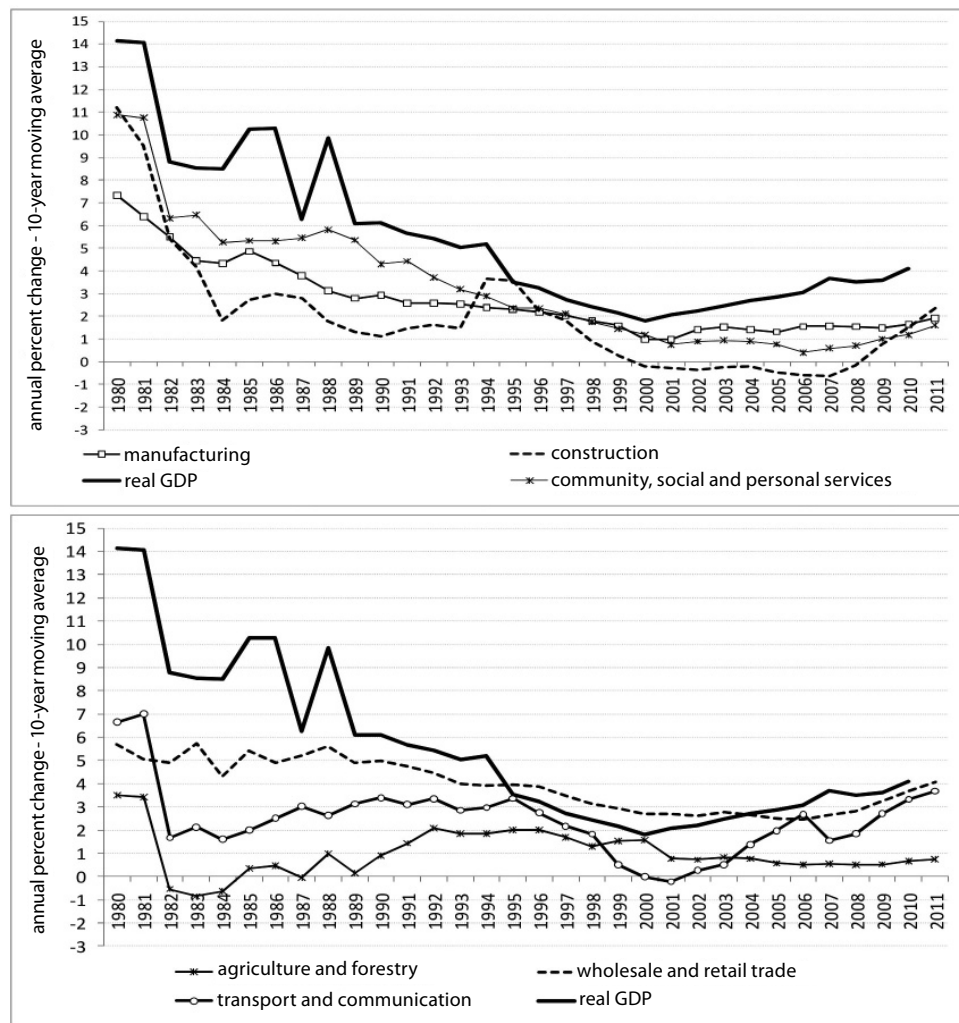
Figure 1: Ten-year average of annual growth in real GDP and employment by activities

In terms of distribution, half of total recorded wage employment has been in community, social and personal services. The contribution of agriculture and forestry to total recorded wage employment declined between 1972 and 2011, whereas the contribution of manufacturing stabilised at around 11 per cent (Table 2, panel b). The contribution of wholesale and retail trade to total recorded wage employment increased steadily over the review period. In terms of generating wage employment, wholesale and retail trade, transport and communication and manufacturing outperformed other economic activities (Table 2, panel c).

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Table 2: Trends in recorded wage employment in Kenya

	1972–1979	1980–1989	1990–1999	2000–2011
(a) Recorded wage employment, number of persons				
Community, social and personal services	511 461	857 680	1 131 101	1 248 696
Agriculture and forestry	301 836	300 075	354 282	383 556
Manufacturing	131 090	192 122	240 929	280 696
Wholesale and retail trade	59 724	94 975	139 937	192 972
Transport and communication	76 935	95 948	124 215	147 235
Construction	66 356	88 495	105 374	106 400
Financing, insurance, real estate and business services	30 418	63 828	94 056	105 192
Electricity and water	15 311	33 317	44 218	39 045
Mining and quarrying	3 985	4 660	5 832	7 372
Total recorded wage employment	1 197 116	1 731 101	2 239 943	2 511 164
(b) Share in total recorded wage employment, percent				
Community, social and personal services	42.7	49.5	50.5	49.7
Agriculture and forestry	25.2	17.3	15.8	15.3
Manufacturing	11.0	11.1	10.8	11.2
Wholesale and retail trade	5.0	5.5	6.2	7.7
Transport and communication	6.4	5.5	5.5	5.9
Construction	5.5	5.1	4.7	4.2
Financing, insurance, real estate and business services	2.5	3.7	4.2	4.2
Electricity and water	1.3	1.9	2.0	1.6
Mining and quarrying	0.3	0.3	0.3	0.3
Total wage employment	100.0	100.0	100.0	100.0
(c) Growth in recorded wage employment, percent				
Community, social and personal services	…	67.7	31.9	10.4
Agriculture and forestry	…	-0.6	18.1	8.3
Manufacturing	…	46.6	25.4	16.5
Wholesale and retail trade	…	59.0	47.3	37.9
Transport and communication	…	24.7	29.5	18.5
Construction	…	33.4	19.1	1.0
Financing, insurance, real estate and business services	…	109.8	47.4	11.8
Electricity and water	…	117.6	32.7	-11.7
Mining and quarrying	…	16.9	25.1	26.4
Total wage employment	…	44.6	29.4	12.1

Source: Statistical Abstract, various issues, Kenya National Bureau of Statistics
Note: The figures reported under (a) are the average annual reported wage employment for each decade. The growth rates reported under (c), therefore, refer to the decade mid-points.

In terms of earnings, the highest wages were paid by electricity and water, financing, insurance, real estate and business services, and transport and communication (Table 3, panel a). The fastest growth in average earnings per worker was in electricity and water, community, social and personal services, transport and communication and

construction. The slowest growth in real wage earnings per worker was recorded for wholesale and retail trade, mining and quarrying, manufacturing and financing, insurance, real estate and business services.

Table 3: Trends in recorded wage payments in Kenya

	1972–1979	1980–1989	1990–1999	2000–2011
(a) Average annual real earnings per worker				
Electricity and water	11 491	31 408	105 473	871 034
Financing, insurance, real estate and business services	21 959	52 598	174 718	668 427
Transport and communication	14 091	33 112	109 220	487 445
Wholesale and retail trade	12 620	31 050	113 308	366 305
Community, social and personal services	9 703	21 823	64 838	298 312
Manufacturing	10 591	22 652	80 273	278 318
Construction	8 230	17 804	64 097	253 808
Mining and quarrying	10 050	25 960	54 352	175 436
Agriculture and forestry	3 874	8 730	34 952	147 811
All activities	9 012	21 902	72 614	311 566
(b) Growth in earnings per worker, factor				
Electricity and water	…	2.7	3.4	8.3
Financing, insurance, real estate and business services	…	2.4	3.3	3.8
Transport and communication	…	2.3	3.3	4.5
Wholesale and retail trade	…	2.5	3.6	3.2
Community, social and personal services	…	2.2	3.0	4.6
Manufacturing	…	2.1	3.5	3.5
Construction	…	2.2	3.6	4.0
Mining and quarrying	…	2.6	2.1	3.2
Agriculture and forestry	…	2.3	4.0	4.2
All activities, average real earnings per worker	…	2.4	3.3	4.3

Source of data: Statistical Abstract, various issues, Kenya National Bureau of Statistics
Note: The figures reported under (a) are the average annual reported wage payments for each decade.
The growth rates reported under (b), therefore, refer to the decade mid-points.

From the preceding analysis, it emerges that agriculture and forestry, wholesale and retail trade, transport and communication, and manufacturing are the dominant activities in the Kenyan economy. Of these activities, agriculture and forestry, and manufacturing made a small contribution to total recorded wage employment in Kenya of 15.3 per cent and 11.2 per cent, respectively, on average from 2000–2011, while wholesale and retail trade, and transport and communication made even smaller contributions to total recorded wage employment of 7.7 per cent and 5.9 per cent, respectively, from 2000–2011. Moreover, growth in wage employment in

these activities decelerated from 2000–2011 compared to 1990–1999. Over the two reference periods, growth in real wage earnings per worker increased in transport and communication and agriculture, stagnated in manufacturing and declined in wholesale and retail trade.

3   The data and methods

The demand for labour may be derived from a profit maximisation condition as a function of output, capital and a time trend representing technological progress (see, e.g., Hutchings & Kouparitsas, 2012). In brief, from a profit maximisation condition given as

$$\max_Q \pi = pQ - wL(Q) - rK(Q) \text{ subject to } Q = F(A, L, K)\ (1)$$

where π is profits, Q is quantity produced, p is the unit cost of output, L is the number of workers, w is the hourly wage, K is the stock of capital, r is the cost of renting capital and A is technical change. The long-run demand for labour that would solve the problem defined in (1) would be obtained from the first-order condition for labour. The equilibrium demand for labour would thus be defined as

$$L = F[A, Q, w/p] \tag{2}$$

Equation 2 suggests that the level of output, real wages and technical progress determine the demand for labour. Log-linear forms of (2) have been extended in a number of empirical studies to include additional explanatory variables such as payroll taxes, employment benefits (including bonuses, health and pension contributions), employment protection, union membership, labour productivity, the price of intermediate goods, wages relative to the cost of capital, external tariff rate, quantitative restrictions and public expenditure on labour market policies (see Barrell, Pain & Young, 1996; Aggarwal, 2002; Bernal & Cardenas, 2003; Goldar, 2009; Omolo, 2010). For the purposes of this study, the estimable demand for wage labour equation is derived with a focus on variables that may influence wage employment and on the basis of concerns raised in previous studies on unemployment in Kenya. The estimable equation is, therefore, augmented to include enrollment in schools which could impact the supply of labour (particularly among the youth) and the terms of trade, which could be a source of pressure to increase wages (and more so the effect of import prices). Due to data limitations, the study excludes total factor productivity, since available data on output and wage employment by economic activity do not match. It is not clear from the reported data which part of sectoral output is attributable to wage employment. Lags are introduced in the estimable equation to account for delayed adjustments in the demand for labour due to changes in the selected macroeconomic variables.

This study focuses on the effects of a set of economic variables on total recorded wage employment and wage employment in six economic activities, namely agriculture; manufacturing; financing, insurance, real estate and business services

(financial and business services in short); wholesale and retail trade; transport and communication; and construction. Excluded is community, social and personal services, owing to a lack of data on output from this activity over the study period (1972–2010). The set of explanatory economic variables considered are wage payments for each activity considered (WP), output for each activity considered (Y), real gross domestic product (GDP), gross fixed capital formation (GFCF), terms of trade (TOT), inflation (INFL) and total pupil enrollment in schools[2] (PE).

The approach used in this study is to estimate single equation error correction models of the form

$$\Delta WE_t = \alpha_t + \sum_{t=0}^{n}(\beta_u \Delta Z_{t-1}) + \lambda_t ECM_{t-1} + \varepsilon_t \qquad (3)$$

where WE_t is wage employment, ECM_t is the error correction term and Z_t is a vector of explanatory variables, that is, WP_t, Y_t, GDP_t, $GFCF_t$, TOT_t, $INFL_t$ and PE_t. A unique vector that includes all explanatory variables is first identified using the Johansen cointegration technique. The error correction term is then derived from this vector as follows:

$$ECM_t = \delta_1 lnWE(X)_t - \delta_2 lnWP_t - \delta_3 lnY(X)_t - \delta_4 lnGDP_t - \delta_5 lnGFCF_t - \delta_6 lnTOT_t - \delta_7 INFL_t - \delta_8 lnPE_t - c \qquad (4)$$

where X represents either one of agriculture (AGRIC), manufacturing (MANUF), financial and business services (FINAN), wholesale and retail trade (TRADE), transport and communication (TRANS), construction (CONSTR) and the economy as a whole (TOTAL). There will, therefore, be seven error correction equations.

Given that firms may take time to adjust factors of production, the estimable Equation 4 can be viewed as the long-run equilibrium demand for labour. Short-run deviations from this equilibrium demand for labour may exist as firms gradually adjust their production factors. The following effects are expected to hold in the long run: wage employment increases with output and domestic inflation and decreases with wage payments and with a relative increase in import prices. The rationale is that as aggregate demand (proxied by output) and unit product prices increase, firms will seek higher revenues through increased production, which will in turn increase their demand for labour. On the other hand, a relative increase in import prices (or deterioration in the terms of trade) is expected to raise domestic consumer prices and induce demand for higher wages, which in turn will raise the cost of labour facing firms. Firms will subsequently be expected to cut back on their demand for labour. The effect of GFCF is mixed, depending on whether the investment is meant to enhance the productivity of labour or to save on the amount of labour.

Annual data for Kenya (1972–2010) on the following variables are used in the study: wage employment by economic activity; wage payments by economic activity; real GDP by economic activity; gross fixed capital formation; terms of trade; enrollment in schools and the consumer price index. Economic activities considered

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2   This covers enrollment in primary, secondary, teacher training and technical schools.

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are agriculture and forestry, manufacturing, transport and communication, wholesale and retail trade, construction, financial and business services. The data were obtained from various issues of the *Statistical Abstract* published by the Kenya National Bureau of Statistics.

4   Results

An error correction model is estimated for the whole economy and for each economic activity considered, i.e., agriculture, manufacturing, financial and business services, wholesale and retail trade, transport and communication and construction. The variables of interest are non-stationary and integrated of the first order. This was determined using the Augmented Dickey-Fuller test (ADF). The null hypothesis that the variables in their levels form contain a unit root was tested, in which case the variables would be non-stationary. The null hypothesis that the variables in their first differenced form contain a unit root was also tested, in which case the variables would be determined to be non-stationary even after being differenced once. The ADF test statistics obtained are presented in Appendix Table 1.1. The results show that all the variables of interest contain a unit root in their levels form but not in their first difference form.

Vector error correction models were then estimated and the unique cointegrating vectors obtained in each case. The estimation results are presented in Appendix Table 1.2. The error correction terms derived from these vectors are listed as Equations 5 to 11:

$$ECM_t = lnWEMANUF_t - 0.149lnWPMANUF_t - 0.474lnYMANUF_t + 0.099lnGDP_t - 0.196lnTOT_t + 0.831lnPE_t + 4.216 \tag{5}$$

$$ECM_t = lnWEAGRIC_t + 0.475lnWPAGRIC_t + 0.609YAGRIC_t + 1.513lnGDP_t - 0.923lnGFCF_t + 0.027lnINFL_t - 1.794lnPE_t + 24.046 \tag{6}$$

$$ECM_t = lnWEFINAN_t - 0.362lnWPFINAN_t + 0.085lnYFINAN_t + 0.795lnGDP_t - 0.364lnGFCF_t - 0.051lnTOT_t - 0.021lnINFL_t + 0.808lnPE_t + 0.004trend - 2.314 \tag{7}$$

$$ECM_t = lnWETRADE_t + 0.272lnWPTRADE_t - 0.096lnYTRADE_t + 1.444lnGDP_t - 0.636lnGFCF_t - 0.218lnTOT_t + 0.042lnINFL_t - 1.181lnPE_t + 20.389 \tag{8}$$

$$ECM_t = lnWETRANS_t - 0.566lnWPTRANS_t - 0.280lnYTRANS_t - 0.162lnGDP_t + 0.644lnGFCF_t - 0.268lnTOT_t - 0.004lnINFL_t + 1.546lnPE_t - 6.784 \tag{9}$$

$$ECM_t = lnWECONSTR_t - 0.343lnWPCONSTR_t - 0.494lnYCONSTR_t + 1.748lnGDP_t - 0.577lnGFCF_t - 1.170lnTOT_t + 0.083lnINFL_t - 2.741lnPE_t + 54.204 \tag{10}$$

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$$ECM_t = lnWETOTAL_t + 0.137lnWPTOTAL_t + 1.523lnGDP_t$$
$$- 0.813lnGFCF_t - 0.624lnTOT_t + 0.042lnINFL_t - 2.074lnPE_t$$
$$+ 40.307 \tag{11}$$

4.1 Long-term effects

The cointegrating vectors (5) to (11) represent the long-run equilibrium demand for labour for each respective economic activity considered in the study. The equations indicate that in the long run, overall economic growth has not had a positive impact on wage employment. The only activity in which wage employment is positively associated with overall GDP growth is transport and communication. An increase in sectoral output has, however, had a positive impact on wage employment in construction, manufacturing, transport and communication and wholesale and retail trade, but a negative impact on wage employment in finance and business services and agriculture. This negative impact indicates that growth in sectoral output in finance and business services and agriculture is attributable to factors other than labour. An increase in wage payments has a positive long-term impact on wage employment across the economic activities, except for wholesale and retail trade. An increase in capital investment has a long-term positive impact on wage employment in wholesale and retail trade, construction, finance and business services, but a negative long-term impact on wage employment in agriculture, and transport and communication. The negative impact of capital investment on wage employment in agriculture and transport and communication may be indicative of increased use of capital-intensive processes in production. The long-term effect of enrollment in schools on wage employment is also mixed, with a positive effect found for wage employment in agriculture, wholesale and retail trade and construction, but a negative effect for wage employment in manufacturing, finance and business services, and transport and communication. An increase in domestic inflation has generally had a negative impact on wage employment in Kenya, but an increase in the terms of trade has stronger positive effects on total wage employment and wage employment across all economic activities.

4.2 Short-term effects

The error correction terms defined by (5) to (11) were used in estimating short run equations. The solved estimation results of the error correction models are presented in Table 5. In the short term, total wage employment is positively associated with overall economic growth and school enrolment, but is negatively associated with capital investment, wage payments and, to a lesser extent, inflation. Specifically, a one per cent increase in real GDP growth and a one per cent increase in school enrolment are associated, respectively, with a 0.01 per cent and a 0.51 per.cent increase in total wage employment, whereas a one per cent increase in wages and a one per cent increase in capital investment are associated

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Table 4: Estimation results – solved coefficients from preferred error correction models

Independent variables [1]	Dependent variables						
	ΔlnWEMANUF	ΔlnWEGRIC	ΔlnWEFNAN	ΔlnWERADE	ΔlnWETRANS	ΔlnWECONSTR	ΔlnWETTAL
Constant	0.02	0.02	-0.02	0.02	-0.03	-0.01	0.17
ΔlnWP(X)/2	0.04	-0.13	-0.47	-0.01	0.18	-0.29	-0.99
ΔlnY(X)/2	-0.08	0.00	0.03	…	0.43	-0.18	…
ΔlnGDP	0.09	-0.07	0.40	0.10	0.55	0.36	0.01
Δln GFCF	0.13	-0.05	0.16	-0.11	…	-0.07	-0.36
ΔlnTOT	-0.08	-0.10	-0.48	-0.05	-0.28	…	0.00
ΔINFL	0.00	0.00	-0.01	0.00	0.01	0.01	-0.01
ΔlnPE	-0.11	-0.12	0.95	0.37	-0.66	0.42	0.51
Dummy	-0.06	0.05	0.06	…	0.07	-0.10	-0.16
ECM	-0.20	-0.17	-0.42	-0.13	-0.16	-0.05	-0.17
Diagnostics [probabilities in parentheses]							
Adjusted R^2	0.83	0.94	0.91	0.77	0.83	0.84	0.77
F-statistic [prob]	14.14 [0.00]	44.48 [0.00]	17.65 [0.00]	14.26 [0.00]	11.06 [0.00]	13.28 [0.00]	10.88 [0.00]
Sum of squared residuals	0.01	0.01	0.01	0.00	0.02	0.02	0.01
Jarque-Bera [prob]	0.11 [0.94]	1.05 [0.59]	0.35 [0.84]	4.17 [0.12]	0.77 [0.68]	0.05 [0.97]	1.27 [0.53]
Breusch-Godfrey Serial Correlation LM	$F_{(2,19)}$ [0.91]	$F_{(2,17)}$ [0.18]	$F_{(2,10)}$ [0.52]	$F_{(4,19)}$ [0.11]	$F_{(2,12)}$ [0.33]	$F_{(2,15)}$ [0.72]	$F_{(2,20)}$ [0.99]
Heteroskedasticity Test: Breusch-Pagan-Godfrey	$F_{(12,21)}$ [0.93]	$F_{(12,19)}$ [0.77]	$F_{(22,12)}$ [0.28]	$F_{(8,23)}$ [0.80]	$F_{(13,14)}$ [0.98]	$F_{(13,17)}$ [0.19]	$F_{(11,22)}$ [0.24]
Ramsey RESET	$F_{(1,20)}$ [0.74]	$F_{(1,18)}$ [0.61]	$F_{(1,11)}$ [0.60]	$F_{(1,22)}$ [0.48]	$F_{(1,13)}$ [0.61]	$F_{(1,16)}$ [0.38]	$F_{(1,21)}$ [0.75]

[1] The coefficients presented here are the solved estimates derived from the short-run error correction models. All reported coefficients are statistically significant at the 5 percent level.

[2] The X refers to each economic activity (MANUF, AGRIC, FINAN, TRADE, TRANS, CONSR, TOTAL) according to the respective model

respectively, with a 0.99 per cent and a 0.36 per cent decrease in total recorded wage employment.

The response of wage employment by economic activity to these economic factors does, however, vary. An increase in wage payments by one per cent is associated with a 0.47 per cent decline in wage employment in finance and business services, a 0.29 per cent decline in wage employment in construction and a 0.13 per cent decline in wage employment in agriculture. A one per cent increase in wage payments is, however, positively associated with increases in wage employment in transport and communication, and manufacturing by 0.18 per cent and 0.04 per cent respectively.

An increase in output from each respective activity has a positive effect on wage employment in transport and communication and finance and business services but a negative effect on wage employment in construction and manufacturing. A one per cent increase in output from transport and communication is associated with a 0.43 per cent increase in wage employment in transport and communication whereas a one per cent increase in sectoral output would decrease wage employment in construction and manufacturing by 0.18 per cent and 0.08 per cent, respectively. Improved overall economic performance as measured by growth in real GDP is positively associated with wage employment in all economic activities except agriculture. The results imply that as the economy grew, there was a movement of labour out of agriculture to other economic activities in the short-term.

In terms of investment, a one per cent increase in capital investment (as measured by growth in gross fixed capital formation) is associated with increases in wage employment in the finance and business services by 0.16 per cent and manufacturing by 0.13 per cent. An increase in capital investment, however, negatively impacted on wage employment in wholesale and retail trade, construction and agriculture. In terms of prices, domestic inflation does not seem to have a sizeable effect on wage employment across the economic activities. Stronger price effects enter the equations via the terms of trade. An increase in the terms of trade tends to impact negatively on wage employment across all activities considered in the study and more particularly on wage employment in finance and business services, transport and communication and agriculture. An increase in the terms of trade indicates improved earnings in the export sector as the real value of exports rise relative to the real value of imports. However, an improvement in terms of trade can also mean that imports have become comparably cheaper. The error correction terms across the models indicate that adjustment of wage employment back to equilibrium is slow. Only in financial and business services does 42 per cent of the disequilibrium get resolved in the first year.

4.3   *Summary of the results*

Contrary to expectations, an increase in GDP has had a long-term negative impact on wage employment across the economic activities considered, except in transport and communication, but a short-term positive effect on wage employment across

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economic activities, except in agriculture. However, an increase in sectoral output has had positive long-term effects on wage employment across the economic activities (except in agriculture and finance and business services) and short-term positive effects on wage employment across the economic activities (except in manufacturing and construction). An increase in capital investment has had a positive long-term impact on wage employment (except in agriculture, and transport and communication), but has has positive short-run impacts only on wage employment in manufacturing and finance and business services. An increase in domestic inflation has had largely negative long-term effects on wage employment, but has had smaller positive short-term effects on wage employment across the economic activities (except finance and business services). An increase in the terms of trade has, however, had positive long-term effects on wage employment across the board, but the short-term effects are negative. Increased school enrolment has not benefited wage employment in manufacturing, agriculture, and transport and communication, in either the short or the long term. However, increased school enrolment has had positive effects on wage employment in wholesale and retail trade and construction, both in the short and long-term, but has also had a positive short-term effect on wage employment in the finance and business services.

5 Conclusions and policy recommendations

Open unemployment and wage employment in Kenya exhibited similar trends between 1998/1999 and 2005/2006. Both declined from 15 per cent in 1998/1999 to 13 per cent in 2005/2006. Also, although informal employment figures have increased in recent years, existing studies on unemployment in Kenya caution that the informal sector may no longer be relied upon to absorb additional labour. This means that improving on wage employment is a more pragmatic way to resolve the unemployment problem in Kenya. The preference for formal employment is also linked to the quality of employment in terms of incomes and working conditions, especially since the objective of achieving lower unemployment rates is attached to poverty reduction.

Previous studies on unemployment in Kenya attribute unemployment to, among other factors, slow economic growth; low employment intensity of growth; cost of labour in terms of wages; adoption of labour-saving technology; low level of education among workers; and foreign competition that impacts negatively on the profitability of local firms. The effects of these factors on wage employment across six dominant economic activities were considered in this study. The results indicate that increasing real output across the various economic activities and the economy as a whole does not guarantee higher wage employment. The key to higher long-term wage employment in Kenya would be to increase investment in capital, to increase the value of Kenya's exports and to keep domestic inflation low. The country would, however, need to be strategic in choosing the type of capital to invest in, so as to avoid displacing labour from production processes.

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From the side of the external sector, although an improvement in export prices relative to import prices tends to have a negative short-term effect on wage employment in Kenya, the negative effect reverses when a longer horizon is considered. This implies that in resolving the country's unemployment problem, it would be beneficial to invest in increasing the value of Kenya's exports. Although the empirical literature on the Kenyan labour market raises concerns about employer–worker relations in the export sector, the findings in Were (2006) are encouraging, in that export expansion does not necessary come with a bias in the demand for casual workers on the part of exporting firms. To reiterate the recommendations of Were (Ibid), efforts at improving the wages and working conditions of workers in Kenya should target the entire economy, not just the export sector.

Biographical note

Sheila Kaminchia holds an MSc in Economic Management and Policy from the University of Strathclyde, United Kingdom, and a BA in Economics from the University of Nairobi, Kenya. A Graduate Fellow with the Macroeconomic and Financial Management Institute of Eastern and Southern Africa, Harare, she currently works on output and inflation analysis at the Central Bank of Kenya, Nairobi.

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References

Aggarwal, S.C. (2002). 'Labour demand function for the Indian organized industry: An instrument variable approach', *Indian Economic Review*, vol. 37, no. 2, pp. 209–220.

Barrell, R., Pain, N., and Young, G. (1996). 'A cross-country comparison of the demand for labour in Europe', *Weltwirtschaftliches Archiv*, vol. 132, no. 4, pp. 638–650.

Bean, C.R. (1994). 'European unemployment: A survey', *Journal of Economic Literature*, vol. 32, no. 2, pp. 573–619.

Bernal, R., and Cardenas, M. (2003). 'Determinants of labor demand in Colombia: 1976–1996', National Bureau of Economic Research Working Papers No. 10077.

Blanchard, O. (2006). 'European unemployment: The evolution of facts and ideas', *Economic Policy*, vol. 21, no. 45, pp. 5–59.

Blanchard, O., and Wolfers, J. (2000). 'The role of shocks and institutions in the rise of European unemployment: The aggregate evidence', *Economic Journal*, vol. 110, no. 462, pp. 1–33.

Bruno, M. (1985). 'Aggregate supply and demand factors in OECD unemployment: An update', National Bureau of Economic Research Working Papers No. 1696.

Central Bureau of Statistics (2003). *Report of 1998/99 Labour Force Survey*, Ministry of Planning and National Development, Government Printer, Nairobi.

Central Bureau of Statistics (2008). *Analytical Report: 2005–06 Labour Force Survey*, Ministry of Planning and National Development, Government Printer, Nairobi.

Chen, Z., Kannan, P., Loungani, P., and Trehan, B. (2011). 'New evidence on cyclical and structural sources of unemployment', Federal Reserve Bank of San Francisco Working Papers No. 2011 –17.

Fabiani, S., Locarno, A., Oneto, G., and Sestito, P. (2000). 'The sources of unemployment fluctuations: An empirical application to the Italian case', European Central Bank Working Papers No. 29.

Fan, K. (2004). 'Sources of unemployment', *Hong Kong Monetary Authority Quarterly Bulletin*, no. 39, pp. 5–15.

Godia, G. (1987). 'Education and the unemployment problem in Kenya', *Journal of Negro Education*, vol. 56, no. 3, pp. 356–367.

Goldar, B. (2009). 'Trade liberalisation and labour demand elasticity in Indian manufacturing', *Economic and Political Weekly*, vol. 44, no. 34, pp. 51–57.

Hutchings, R., and Kouparitsas, M. (2012). 'Modelling aggregate labour demand', Australian Government Treasury Working Papers No. 2.

Kalecki, M. (1943). 'Political aspects of full employment', *Political Quarterly*, vol. 14, no. 4, pp. 322–330.

Karanassou, M., Sala, H., and Salvador, P.F. (2007). 'Capital accumulation and unemployment: New insights on the Nordic experience', Discussion Papers No. 3066, *mimeo*, Institute for the Study of Labor, Bonn.

Kenya National Bureau of Statistics (Various issues: 1972 to 2012). *Statistical Abstract*, Government Printer, Nairobi.

Keynes, J.M. (1936). *The general theory of employment, interest, and money*, Harcourt, Brace & World, New York.

Kindiki, M.M. (2011). 'International regime governance and apparel labour upgrading in export processing zones in urban Kenya', *African Review of Economics and Finance*, vol. 3, no. 1, pp. 26–40.

Krugman, P. (1994). 'Past and prospective causes of high unemployment', *Economic Review*, Federal Reserve Bank City, vol. 79, no. 4, pp. 23–43.

Manda, D.K. (2002). 'Globalisation and the labour market in Kenya', Discussion Papers No. 6, *mimeo*, Kenya Institute for Public Policy Research and Analysis, Nairobi.

Morgan, J., and Mourougane, A. (2001). 'What can changes in structural factors tell us about unemployment in Europe?', European Central Bank Working Papers No. 81.

Nickell, S., Nunziata, L., and Ochel, W. (2005). ,Unemployment in the OECD since the 1960s. What do we know?' *Economic Journal*, vol. 115, pp. 1–27.

Odhiambo, W., and Manda, D.K. (2003). 'Urban poverty and labour participation in Kenya', paper presented at the World Bank Urban Research Symposium, the World Bank, Washington D.C., 15–17 December, 2003.

Omolo, J. (2010). 'The dynamics and trends of employment in Kenya', Institute of Economic Affairs, Kenya, Research Papers No. 1.

Omolo, J. (2012). 'Youth employment in Kenya: Analysis of labour market and policy interventions', Friedrich-Ebert-Stiftung Occasional Papers No. 1.

Pack, H. (1977). 'Unemployment and income distribution in Kenya', *Economic Development and Cultural Change*, vol. 26, no. 1, pp. 157–168.

Peng, W., Cheung, L., and Fan, K. (2001). 'Sources of unemployment: Recent developments and prospects', *Hong Kong Monetary Authority Quarterly Bulletin*, no. 29, pp. 38–48.

Pollin, R., Gĩthĩnji, M., and Heintz, J. (2008). *An employment-targeted economic program for Kenya*, Edward Elgar, Chettenham, UK and Northampton, MA..

Smith, R. P., and Zoega, G. (2008). 'Global factors, unemployment adjustment and the natural rate', *Economics: The Open-Access, Open-Assessment E-Journal*, vol. 2, no. 22, pp. 1–29.

Wälde, K., and Weiss, P. (2006). 'Relative price changes, wages and unemployment in a specific factors model with search frictions', *Review of Development Economics*, vol. 10, no.3, pp. 400–410.

Wambugu, A., Munga, B., and Onsomu, E. (2009). *Unemployment in Kenya: The situational analysis*, Kenya Institute for Public Policy Research and Analysis, Nairobi.

Were, M. (2006). 'Export-orientation and employment patterns in Kenya's manufacturing sector: Firm-level evidence', draft paper for presentation at the CSAE conference, Centre for the Study of African Economies, Oxford, 18–20 March, 2007.

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Appendix

Table 1.1: ADF test statistics – null hypothesis: variable contains a unit root

Variable Name	Symbol of Variable	Levels	First Difference
Domestic Inflation	INFL	-0.19	-8.89
Terms of trade	TOT	-2.17	-6.85
Gross fixed capital formation	GFCF	-1.46	-6.84
Real gross domestic product	GDP	-2.61	-3.08
Total pupil enrollment in schools	PE	-2.77	-5.21
Wage employment in Transport and Communication	WETRANS	-0.34	-5.48
Wage employment in Manufacturing	WEMANUF	-2.93	-5.36
Wage employment in Wholesale and Retail Trade	WETRADE	-2.59	-9.93
Wage employment in Construction	WECONSTR	-2.35	-4.13
Wage employment in Agriculture	WEAGRIC	-0.68	-5.11
Wage employment in Financial and Business Services	WEFINAN	-1.21	-5.02
Total wage employment	WETOTAL	-2.59	-4.06
Real wage payments in Transport and Communication	WPTRANS	-1.04	-4.13
Real wage payments in Manufacturing	WPMANUF	-2.21	-8.05
Real wage payments in Wholesale and Retail Trade	WPTRADE	-1.25	-4.37
Real wage payments in Construction	WPCONSTR	-2.69	-6.03
Real wage payments in Agriculture	WPAGRIC	-1.84	-7.41
Real wage payments in Financial and Business Services	WPFINAN	-1.91	-3.96
Total real wage payments	WPTOTAL	-0.94	-5.05
Real output from Transport and Communication	YTRANS	-1.20	-8.40
Real output from Manufacturing	YMANUF	-2.26	-7.78
Real output from Wholesale and Retail Trade	YTRADE	-2.00	-7.98
Real output from Construction	YCONSTR	-1.56	-6.86
Real output from Agriculture	YAGRIC	-2.28	-8.37
Real output from Financial and Business Services	YFINAN	-2.07	-5.70

ADF critical values: -2.94 at 5% level of significance; -2.61 at 10% level of significance

Table 1.2: Estimated cointegrating equations [t-statistics in parenthesis]

	CointEq1		CointEq2		CointEq3		CointEq4
LWE_MANUF(-1)	1.000	LWE_AGRIC(-1)	1.000	LWEFINAN(-1)	1.000	LWETRADE(-1)	1.000
LTOT(-1)	0.196	INFL(-1)	-0.027	INFL(-1)	0.021	INFL(-1)	-0.042
	[2.670]		[-6.361]		[21.274]		[-14.724]
LREALGDP(-1)	-0.099	LGFCF(-1)	0.923	LTOT(-1)	0.051	LTOT(-1)	0.218
	[-1.063]		[8.575]		[2.126]		[3.395]
LYMANUF(-1)	0.474	LREALGDP(-1)	-1.513	LGFCF(-1)	0.364	LGFCF(-1)	0.636
	[6.294]		[-9.978]		[21.145]		[17.829]
LWPMANUF(-1)	0.149	LYAGRIC(-1)	-0.609	LREALGDP(-1)	-0.795	LREALGDP(-1)	-1.444
	[2.459]		[-5.672]		[-21.283]		[-24.879]
LPE(-1)	-0.831	LWPAGRIC(-1)	-0.475	LYFINAN(-1)	-0.085	LYTRADE(-1)	0.097
	[-5.029]		[-8.098]		[-10.236]		[4.934]
C	-4.216	LPE(-1)	1.794	LWPFINAN(-1)	0.362	LWPTRADE(-1)	-0.272
			[6.756]		[20.316]		[-11.503]
		C	-24.046	LPE(-1)	-0.808	LPE(-1)	1.181
					[-16.891]		[8.671]
				@TREND(72)	-0.004	C	-20.389
					[-4.407]		
				C	2.314		

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Table 1.2: Estimated cointegrating equations [t-statistics in parenthesis], cont'd

	CointEq5		CointEq6		CointEq7
LWETRANS(-1)	1.000	**LWECONSTR(-1)**	1.000	**LWETOTAL(-1)**	1.000
INFL(-1)	0.004	INFL(-1)	-0.083	INFL(-1)	-0.042
	[4.163]		[-10.548]		[-12.218]
LTOT(-1)	0.268	LTOT(-1)	1.170	LTOT(-1)	0.624
	[8.322]		[5.503]		[6.535]
LGFCF(-1)	-0.644	LGFCF(-1)	0.577	LGFCF(-1)	0.813
	[-20.134]		[2.637]		[10.008]
LREALGDP(-1)	0.162	LREALGDP(-1)	-1.748	LREALGDP(-1)	-1.523
	[3.998]		[-4.688]		[-12.135]
LYTRANS(-1)	0.280	LYCONSTR(-1)	0.494	LWPTOTAL(-1)	-0.137
	[11.505]		[2.956]		[-5.858]
LWPTRANS(-1)	0.566	LWPCONSTR(-1)	0.343	LPE(-1)	2.074
	[38.522]		[2.405]		[7.577]
LPE(-1)	-1.546	LPE(-1)	2.741	C	-40.307
	[-18.879]		[4.273]		
C	6.784	C	-54.204		

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