DETERMINANTS OF REAL WAGE IN PUBLIC SECTOR IN KENYA

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Abstract

The purpose of this study was to examine the factors influence real wage in the public sector in the country. In order to realize this, the study used quantitative data collected from secondary sources on public sector wage bill, minimum wage, government structures and inflation. Secondary data was obtained from various secondary sources including official government documents. Both descriptive and inferential statistics were analyzed using SPSS with various statistical tests conducted. These included unit root tests, normality tests and correlation analysis. The study reveals that a large variation in real wage bill in the country explained by structure of the government, inflation and minimum wage regulations. All the variables were found to significantly affect real wage in the country. The study also established that real wage bill has continued to increase and if the trend continues, the country is likely not only suffer in terms of international competitiveness, but also budget deficit which may plunge the country into monumental public debt. Various recommendations were made including formulation and implementation of wage policy that takes into consideration productivity, constitution reforms aimed at minimizing on duplication of duties, functional review of the government departments and organizations, while establishing necessary staffing norms and stakeholder engagement at all levels. Government efforts aimed at enhancing price stability especially the use of both demand and supply side policies are critical.

Keywords: Real wage bill, Inflation, Consumer price index, Minimum wage, Government structures

INTRODUCTION

Globally, economies continue experience phenomenal population growth that continues to put pressure on demand for public goods and services (IEA, 2014; Okech &Lelegwe, 2015). Among the services that the government is required to provide include social services such as education, health, security, infrastructure, among other (IEA, 2014). In order o provide these services effectively governments employ human resources who in turn compensated for the mental and or physical efforts provided. For human resource to remain effective and efficiency in services delivery, remuneration comes in handy. This motivates workers and where this matches their respective qualification, workers are expected to uphold their values and living standards, while still bearing in mind the current harsh economic realities in the country (Buchanan, 1977).

In the early development stage otherwise known as traditional stage, considerable expenditure is required on education and infrastructure to increase production and that government expenditure is expected to be a significant proportion of total output (Musgrave & Rostow, 1960). In this case therefore there is need to employ workers who will be involved in the process. The situation may not be different in Kenya where the government has continued to employee workers as part of economic strategy to spur economic growth while at the same time create employment. It is estimated that the government has about 700,000 civil service workforce, which is however considered one of the largest public work force compared to other sub-Saharan African (SSA) countries that are relatively at the same level of growth and development with Kenya (KIPPRA, 2013).

Studies show that a significant percentage of public revenue spent on the workers leaving a small percentage for development expenditure (Omolo, 2013; KIPPRA, 2013, IEA, 2014). For instance, in 2009/10 financial year, 47.3 of the government's revenue was spent on wages, while in 2012/2013 it was estimated at 55 percent. This is way above the internationally desirable level of 35 percent (IEA, 2014). The high percentages imply that out of the public revenue collected less than half is left for development purposes, as well as meeting other recurrent expenditures for normal daily operations such as stationery, rent and other utilities. The high percentage of public revenue spent on wages is expected to contribute towards crowding out resources that could otherwise be used on development priorities such as social and infrastructure development needed for long term growth and development (GoK, 2014). Other effects include large fiscal deficits in terms of macroeconomic instability such as inflation (wage-price spiral, and exchange rate impact); unsustainable public debt arising from high wage bill attendant refinancing and sovereign risks; and finally loss of competitiveness of the economy, ultimately impacting negatively on growth and employment (GoK, 2014). Reports

show for instance, that there are limited resources to finance critical flagship projects meant to increase productivity in the country and drive towards the envisaged competiveness and middle income country.

There is continued public debate and attention in Kenya on the difference in wages between the public and private sector, which has made it difficult for the public sector to attract and retain talent (KIPPRA, 2013). The general perception however, is that employees in the private sector, particularly the highly skilled ones, earn much higher salaries compared to their public sector counterparts (KIPPRA, 2013). Through the Salaries and remuneration Commission (SRC), the government embarked on the ambitious task of benchmarking and harmonization of salaries of all cadres of civil servants and the private sector (SRC, 2015). If implemented, this is expected to even push the public sector wage bill even higher thereby compounding the problem (SRC, 2015).Any worker has however, a right to earn a decent wage in return for his or her labor and as enshrined in the Constitution of Kenya (KIPPRA, 2013). Over the years, public sector wage bill has continued to show an upward trend. In 2014/15 FY, it grew by 34 per cent leaving insignificant resources for development expenditures which are necessary for productivity. Together with the pensions for retired workers, the government wage bill was estimated at Ksh. 534.7 million translating to 54 per cent of all government revenue and 13 per cent of the country's GDP. This means that 13 per cent of the wealth created in the country goes towards the payment of civil servants' salary. Given that the government also spends more than Ksh 200 billion on foreign debt, excluding domestic debt, a small percentage remains for development expenditure.

Inflation is considered an important parameter in wage related analysis since in Kenya it has been considered in the process of adjusting wages (GoK, 2005). Inflation show an upward trend between 1990 and 1993 ranging between 15.8 to 46 per cent before dropping between 1994 and 1995 at a rate which ranged between 28.8 and 1.6 per cent. From 1997 to 2014 inflation generally rising and declining at a rate not more than 15 per cent. The wide oscillations in inflation were attributed to various factors. Among these include the depreciation of the Kenya shillings that was witnessed in the 1990s which partially led to higher prices for imported raw materials, capital and final consumer goods and subsequently to persistent domestic inflation (GoK, 1990). Inflationary pressures were worsened by decontrol measurers that were announced which impacted prices of final consumer goods both indirectly and directly (Dayan, 2015). Similarly, in the 1990's under the Structural Adjustment Programs (SAPs) price decontrols were affected which in turn negatively impacted on consumer's budget, withholding of donor aid to Kenya coupled with financing of imports using foreign exchange certificates rather than the official allocation subsequently pushed up prices of imports leading to a rise in

general price level for final consumer items (GoK, 1993). Other factors included increases in administered prices, devaluation of the shilling and monetary expansion. The lowest inflation in the 1995 was attributed to continued pursuit of tight monetary policy by central monetary authorities. Then the rise after 1995 was due to upward adjustment in prices of petroleum products and dry weather conditions that prevailed in early 1996 which affected prices of vegetables (Republic of Kenya, 1996; Dayan, 2015).

The variation in the changes of inflation in the 2000 was as a result of various factors. These included decrease in the prices of basic foodstuffs, stability in the Kenya shillings exchange rate, and decline in the price of crude oil, prudent monetary policy, and increase in prices of imports, aftermath of the 2007 post-election violence, bad weather and global high food prices (Dayan, 2015). The changes in inflation levels over the years are linked directly to wage bill in the country as illustrated in figure 1. This is because this had a bearing on not only minimum wages but also on clamor for salary increase among the unionist employees. For instance, over the same period, civil servants registered their trade union which continued to agitate for salary increase while the government had to stay afloat with the adjustments for cost of living. Minimum wages in Kenya have been subjected to periodic reviews following the their establishment in the 1930s (Dayan, 2015). Minimum wage reviews are done annually and follow Labour Day celebrations, which are always held on 1st of May of every year. According to Dayan (2015) the rate of inflation is one of the most important parameters taken into consideration while adjusting minimum wages (MWs). Inflation rate rose drastically between 1990 and 1993, for instance the rate ranged between 15.8 to 46 per cent. The inflation rate then dropped between 1994 and 1995 at a rate which ranged between 28.8 to 1.6 per cent. From 1997 to 2014 inflation was generally rising and declining at a rate not more than 15 per cent.

The enormous variations in inflation have stimulated much interest in its effect on minimum wages in Kenya. The rate of changes in MWs has been varying overtime. Under A WAB the increase ranged between 6 and 31 percent while the increase in MWs as determined by GWAB ranged between 4 and 30 per cent. During the period 1994-2014 national GDP has been varying at a rate ranging between - 0.8 to 6.9 per cent. Changes in MWs have been at variance with the changes in the inflation rate except for the periods 2007, 2008 and 2014 when there was MW increase freeze. During the aforementioned periods, Kenya recorded a growth rate of 6.9, 1.52 and 5.5 per cent respectively. Percentage change in GDP has remained below percentage change in MWs except in 1993 when the country recorded a negative growth rate and in 2007, 2008 and 2014 when there was MW increase freeze. For the periods 2007,2008 and 2014 workers were prone to experience decay in their purchasing powers caused by

increase in the cost of living. It is therefore necessary to examine how MWs have impacted on wage bill in Kenya.

Statement of the Problem

In Kenya, this is considered the highest in Sub-Saharan Africa (IEA, 2014). This is expected to contribute towards various internal and external macroeconomic effects. Among these include crowding out resources that could be used in other development priorities such as social and infrastructure development needed for long term growth and development; large fiscal deficits with macroeconomic instability in terms of inflation which may lead to wage-price spiral, exchange rate impact. Others include unsustainable public debt arising from high wage bill with may lead to refinancing and sovereign risks; and finally, loss of competitiveness of the economy, ultimately impacting negatively on growth and employment (GoK, 2014; IEA, 2014, Okech &Lelegwe, 2015). The trend in the increase continues to strain government's budget which in the end, denies the economy the much needed resources for infrastructure and key social services like health and education (GoK, 2014). To contain this, the government has from time to time adopted various strategies including pay cut for senior government officers, freezing employment, putting a cap on interest and provision of subsidies (to contain inflation),harmonization of salaries for civil servants, merging of state corporations and parastatals, delays in the disbursement of pensions and payments to the elderly and marginalized persons, among other measures (KIPPRA, 2013; GoK, 2014).

Despite the initiatives, public sector wage bill continues to increase over time (KIPPRA, 2013; IEA, 2014; Okech &Lelegwe, 2015). Whereas studies and reports have attempted to explain this, a few only documented the causes of increase in public sector wage bill such as duplication of duties, number of commissions, state officers and civil servants without necessarily providing the significance of these variables to inform and sustain public debate and dialogue. Similarly, one would argue that this study only addressed one factors as the cause of high wage bill in this case government structures. On the other hand, Dayan (2017) only addressed the effects of inflation on minimum wages which means just like Okech & Lelegwe only considered one variable without necessarily considering other variables such as government structures and minimum wages. Again the study by Diyan (2015) was very particular by addressing how inflation has affected wage bill. Overall, the study sought to examine the factors contributing to the upward trend in the real wage in the public sector using both conceptual framework and model. Whereas trade union activities may affect wage bill, the current study omitted this variable due to expected problems with its measurement and collection of date from existing sources. It is expected that in the end, this would facilitate the

identification of the significance of the variables which would provide necessary information for purposes of policy dialogue and debate by stakeholders.

Objectives of the study

The purpose of the study was to examine the determinants of real wage in public sector in Kenya over a period of time. In order to realize this, key specific objectives include to examine how government structures influence real wage in public sector in the country; to determine the effect of inflation on real wage the public sector in Kenya and; to examine the effect of social transfers on real wage in the public sector.

CONCEPTUAL FRAMEWORK AND RESEARCH GAPS

Conceptual Framework

To address the study objectives, a conceptual framework shown in figure 1 was used to summarize the relationship between the dependent and independent variables. The conceptual framework provides the linkage between the dependent variable and the independent variables. In the figure, the dependent variable is the public sector real wage bill while the dependent variables are government structures measured in terms number employees at both national and county governments. Others are inflation measured in terms of consumer price index (CPI); minimum wage which was measured in terms of lowest paid wage fixed by law.

Figure 1: Conceptual Framework
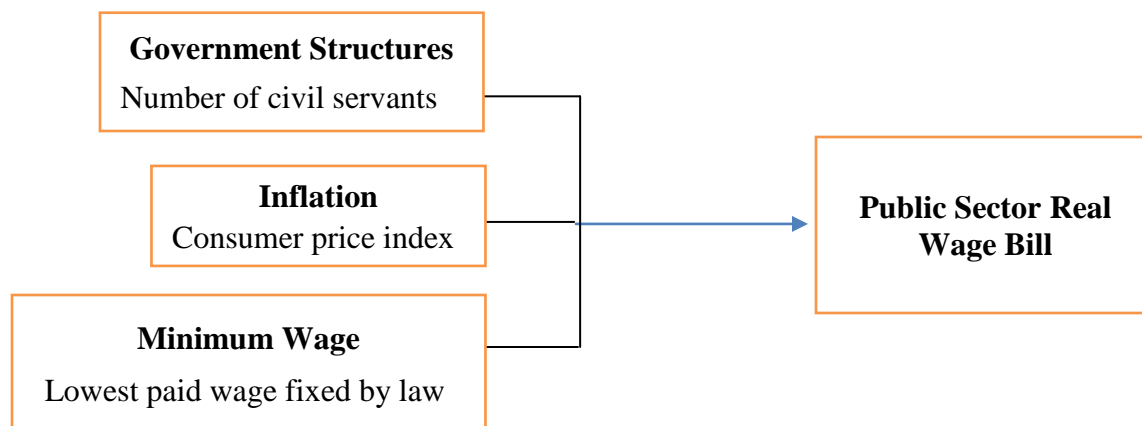
Research Gap

Literature reviewed reveals that there exist theoretical literature in support of public expenditure. Among these include the Ballot Box Theory, Doctrine of Laissez-Faire, Keynesian Theory and Wagner's Law. Others include Pure theory of Public Expenditure, Peacock and Wiseman's

Theory, Veto player theory and Musgrave and Rostow's Development Model. Globally, there exist studies that have attempted to link these theories to public spending at country level in general. Some of these include Abramovitz & Vera (1957), Musgrave & Culbertson(1953) which applied Peacock and Wiseman, Chapman, 2002; Musgrave, 1959 who applied Pure theory of Public Expenditure. It is worth noting that these studies were not only undertaken in the developed world but it has been a while since many of them were undertaken. Additionally, they were not specifically linked to public sector wage bill but public spending in general.

Within the sub-Saharan Africa, there exist general studies on government spending a number of studies exist. These include Ekpo (1995) who regressed the disaggregated components of government capital expenditures; Ogiogio (1995) on the growth impact of recurrent, capital and sectoral expenditures; Odusola (1996) on the interrelationship between military expenditures and economic growth in Nigeria. Others include Fajingbesi (1999) on the relationship between government expenditure and economic growth in Nigeria; Fajingbesi & Odusola (1998) who adopted vector autoregressive (VAR) method in the study of public expenditure and growth in Nigeria; Suleiman (2010) investigated the causal relationship between aggregate public expenditure and its compositions on economic growth for the Nigeria, among others.

Although these studies applied various econometric techniques that will be applied in the proposed study, many of them were sector specific as opposed to the proposed study that will focus on public wage bill. Additionally, unlike in these studies where it is not clear the statistical tests that were done, in the current study various statistical tests will be undertaken before estimating the proposed model. Among these include tests for the Jarque-Bera test for skewness, usual challenges associated with econometric models namely multicollinearity, stationarity, heteroscedasticity and autocorrelation to mention a few.

Locally, whereas a few studies and reports have attempted to explain this (Okech & Lelegwe, 2015; IEA, 2014; GoK, 2014), many of them like Okech &Lelegwe (2015) only documented the causes of increase in public sector wage bill without necessarily looking at the significance of these factors in influencing public sector wage bill. Others like such as duplication of duties, number of commissions, state officers and civil servants without necessarily providing empirical analysis. Additionally, although Okech & Lelegwe (2015) did the qualitative analysis, they did not develop a model upon which the analysis was anchored to examine the significance of the variables that affect public sector wage bill to inform public policy and debate accordingly. Further, key variables like allowances and pensions were equally not captured in the study to examine their significance on public sector wage bill. Against this, the study examined the factors contributing to this trend using both conceptual framework and

model. This will aid in identifying the significance of these variables which provided necessary information for purposes of policy dialogue and debate.

METHODOLOGY

Research Design

A descriptive research design was used to study this research problem. Cooper &Schindler (2003) define a descriptive study as one that is concerned with finding out the what, where and how of a phenomenon. Descriptive research design is based on the fact that the researcher narrates how various events regarding a certain phenomena occur without interfering with the subjects under study. Descriptive studies describe characteristics associated with the subject population and explain the relationship that exists between these variables in order to provide a picture of a particular phenomenon (Cooper& Schindler, 2006). The research focused on determining the factors affecting real wage in Kenya's public sector therefore it was necessary to explore in details the causes of the phenomenon. In this regard, descriptive research design was deemed appropriate. Further the design attempted to describe and define the subject, by creating a descriptive analysis of the problem (Cooper & Schindler, 2003). Various studies have adopted the use of this design to provide a descriptive explanation of various phenomena and it was felt that this could be applied in this case. Some of the studies include Okech &Lelegwe (2015), IEA (2006); IEA (2014), Chege (2015), Muga (2015), among others.

The Data

The target population constituted time series data between 2000 and 2015 on a quarterly basis. It is also assumed that information obtained would provide enough insight to generalize about the situation under investigation.

Time series data in terms of pooled data was collected from secondary sources using fact sheet. The sources included statistical abstracts, economic surveys, Constitution of Kenya, 2010, Public Finance and Management Act 2012. Other sources were financial reports by the Controller of the Budget and Auditor General, Medium Term Expenditure Framework (I & II) and other published relevant reports from Salaries and Remuneration Commission (SRC). These data was collected for the period ranging from 2000 to 2015. This was informed by the fact that it was around this period the economy experienced continuous surge in wage bill and also availability of the data. The data was converted into real terms using 2005/06 financial year (FY) as the base period. The choice of base period was informed by relative stability of the increase between 2004/05 and 2006/07.

Analytical Approach

In this study, the data was analysed using both SPSS and E-Views to obtain various descriptive statistics (line graphs, bar charts) and inferential statistics. However, before estimating the model, various statistical tests were done including normality which was done using the Jarque-Bera test, multicollinearity, stationarity and co integration test.

Measurement of Variables

Table 1 provides a summary of the operationalization and measurement of variables including both dependent and independent variable.

Table 1: Operationalization and Measurement of Variables

Type	Variable	Variable measure	Description
Dependent Variable	Real Wage in Public Sector	Kenya Shillings	This is the amount of money that the government pays for the workers as a result of offering labor services at time t converted using 2005/2006 as the deflator
Independent variables	Government Structures	Measured using the existing government structures including national & county governments, commissions, among others.	Measured by the number of employees of both national and county government who are on payroll only
	Inflation	This refers to the real purchasing converted in terms of consumer price index	This is a quantitative variable measured in percentage in real terms
	Minimum wage	is the lowest wage payable to designated employees as fixed by law.	The variable was measured by the reported values as set under General Wages Advisory Board (GWAB)

FINDINGS

Descriptive Statistics

Table 2 provides a summary of descriptive statistics between real wage bill, inflation, minimum wage and number of workers.

Table 2: Summary of Descriptive Statistics

	Wage Bill	minimum Wage	Inflation	Number of workers
Mean	212315.8286	9.214285714	8.878571	654185.7
Standard Error	20727.24556	1.363490074	1.151596	5090.606
Median	196601.6	10.5	9.6	655800
Standard Deviation	77554.25146	5.101712705	4.308878	19047.3
Sample Variance	6014661920	26.02747253	18.56643	3.63E+08
Kurtosis	0.635711897	0.055767768	-1.0007	0.643433
Skewness	0.965923568	-0.473541959	0.125929	0.23054
Range	272498.9	18	14.2	72700
Minimum	117002	0	2	619800
Maximum	389500.9	18	16.2	692500
Sum	2972421.6	129	124.3	9158600
Count	14	14	14	14
Largest(1)	389500.9	18	16.2	692500
Smallest(1)	117002	0	2	619800
Confidence Level(95.0%)	44778.49165	2.945641218	2.487872	10997.59

The descriptive statistics for all the variables in real terms are as presented in table 2. The mean value of wage bill, minimum wage, and number of workers in Kenya are 212315.83, 9.2142857, 8.878 and 654185.7 respectively. The data collected on wage bill minimum wage, inflation, and number of workers had a standard error of 20727.24556, 1.36349, 1.151596 and 5090.606 and a standard deviation of 77554.25146, 5.101712705, 4.308878, and 19047.3 respectively.

Diagnostic Tests

Various statistical tests were conducted before estimated the model. These included normality correlation and stationarity tests.

Normality Test

This was done using skewness, kurtosis, and Jacque-Bera statistics. The JB test of normality is a test of the joint hypothesis that S and K are 0 and 3, respectively. Table 2 presents a summary of these with their respective p-values. The Jarque-Bera (JB) test statistic was used to determine whether or not the variables follow the normal probability distribution. The Jarque-Berra statistics indicate that all the variables in the model were normally distributed and accepted at 5% level of significance as reflected in the p-values which are less that less than

5% (0.00<0.05). Thus, the Jarque-Berra statistics number of workers, level of inflation, and the minimum wage were normally distributed.

Correlation Analysis

Correlation of the independent variables was performed to test the problem of multicollinearity between the independent variables. Multicollinearity has the impact of increasing the variances and standard errors of the ordinary least squares (OLS) estimates. High variances imply that the estimates are imprecise, and therefore not very reliable. Table 3 presents the correlation analysis findings.

Table 3: Independent Variable Correlation

	Wage Bill	*minimum Wage*	*Inflation*	*Number of workers*
Wage Bill	1			
minimum Wage	0.054468199	1		
Infaltion	0.012098084	0.180633746	1	
Number of workers	0.296462307	-0.033570978	-0.174310297	1

The results indicate that the correlation between the independent variables was less than 0.3. Based on the figure summarized in the table, it was inferred that the model is devoid of multicollinearity. Therefore there was no multicolinearity among the independent variables was detected allowing for the model estimation and therefore there is no reason not to invalidate to regression results.

White General Heteroscedasticity Test

The White's general heteroskedasticity involves estimating an equation in to obtain residuals (μ_t)

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \mu_t$$ …………………………………………………………….. (1)

The running an auxiliary regression is as follows

$$\mu_i^2 = \alpha_1 + \alpha_2 X_{2i} + a_3 X_{2i}^2 + ... \alpha_6 X_{2i} X_{3i} + v_i$$ ………………………………………………… (2)

The squared residuals from the above equation are regressed against the explanatory variables, and their squared values and cross products. The resultant R^2 from this equation is then obtained. With a null hypothesis of no heteroskedasticity it is demonstrated that the sample size (n) multiplied by R^2 ($R^2 = 0.950325$) from parameters asymptotically follows the chi-square

distribution with a degree of freedom equal to the number of regressors that doesn't include the constant term in parameters.

$$n.R^2 \sim R^2_{d.f}$$ …………………………………………………………......(3)

Looking at the probability values of the chi-square distributions ($\chi = 0.936777 \leq 2.126$) in all the white heteroskedasticity tests for the wage bill equation, they are larger than the 5 per cent critical value hence null hypothesis of homoskedasticity is not rejected.

Inferential Statistics

Unit Root Test

Time series data is often known to have problems with non-stationarity. It is important to determine whether a series is stationary (do not contain a unit root) or not stationary (contains a unit root) before using it. One can obtain a high R^2 with non-stationary data even though there is no meaningful relation between variables, otherwise known as a spurious regression between unrelated variables.Therefore before testing for the existence of cointegration among the variables of interest in the study, unit root tests were carried out using Augmented Dickey-Fuller tests as shown in table 4 below. Quarterly data spanning the period from 2000 q1 to 2014 q4 was used.

Table 4: Unit Root Test order 0

		Wage Bill	Minimum wage	Inflation	Number of workers	
		test statistic	test statistic	test statistic	test statistic k=0	test statistic k=1
Augmented Dickey-Fuller		3.013736***	3.013736***	-4.029207***	-1.651915	-3.779282
Test critical values:	1% level	-4.004425	-4.004425	-4.004425	-4.004425	-4.05791
	5% level	-3.008896	-3.008896	-3.008896	-3.008896	-3.11991
	10% level	-2.690439	-2.690439	-2.690439	-2.690439	-2.701103
Stationarity		Stationary	Stationary	Stationary	Stationary at 1st deference	

Notes: *** rep stationary variable at k^{th} order of difference

From the table 4 the results suggests that wage bill, minimum wage and inflation are stationary since their absolute values at 5% level of significance are less than the calculated Augmented Dickey- Fuller value 3.013736 (3.008896), 3.013736 (3.008896) and 4.029207 (3.008896)

respectively. The number of employees is significant at first difference on the absolute value of 3.779282 (3.11991).

Cointegration Results

Given that we have four variables, there can be three or less cointegrating vectors. Cointegration can be done by simply testing the null hypothesis that $r = 0$, $r \leq 1$, $r \leq 2$, and $r \leq 3$. The results, reported in table 5 that indicate one cointegrating equation for the Real wage.

Table 5: Cointegration test results

H_0	Eigen-value statistics	Max-Eigen Statistic	Critical Value at 5% CL	P-value**
$\gamma \leq 0$	0.294764	4.539901	3.841466	0.0331
$\gamma \leq 1$	0.294764	4.539901	3.841466	0.0331
$\gamma \leq 2$	0.412338	6.910841	3.841466	0.0086
$\gamma \leq 3$	0.045025	0.598905	3.841466	0.4390

Normalizing the cointegrating variable with respect to Wage bill, results in the following cointegrating relationships.

WB = β_0 + 0.29(MW) + 0.412(In) + ε_t………………………………………………………..(4)
(Long-run for wage billfunction)

The results suggest that the minimum wage and inflation have positive long term effects on wage bill with parameters of 0.2947, and 0.412, with their p value of 0.0331 and 0.0086 respectively being less than p=0.05. Despite the fact that the number of civil servants has effect on the real wage, however there is no prove that it has a long term effect as shown by its parameter of -0.045025 and its p value of 0.4390 that is greater than the critical value of 0.05.

Error-Correction Models

It has been found that there is only one un-cointegrating vector. Error correction models were therefore estimated and results reported in table 6. The estimation period for the error correction model for the wage bill equation a 2010: q4 to 2014 q4. For each export category, the analysis began with 2 lags of the regressors which were then reduced sequentially by eliminating the insignificant lags based on the Akaike AIC criteria to achieve a more parsimonious model. Since there was evidence of heteroscedasticity in the residual series, this was corrected to achieve consistent error terms and covariance. The error correction model results as shown in table 6, 7

and 8 explains the speed at which the dependent variable (wage bill) returns to equilibrium after a shock in at least one of the dependent.

Table 6: Error Correction Model Results for Equation 1 (WB= f (MW)...+e) – (minimum wage)

Vector Error Correction Estimates		
Sample (adjusted): 2003Q1 2014Q4	Standard errors in ( ) & t-statistics in [ ]	
Cointegrating Eq:	CointWB Eq1	
WB(-1)	1.000000	
MW(-1)	20929.01	
	(7897.41)	
	[2.65011]	
C	-429629.2	
Error Correction:	D(WB)	D(MW)
CointWB Eq1	0.171969	-3.21E-05
	(0.07601)	(4.2E-05)
	[2.26233]	[-0.76152]
D(WB(-1))	-0.553180	5.99E-05
	(0.49348)	(0.00027)
	[-1.12097]	[0.21854]
D(WB(-2))	0.165239	-8.70E-05
	(0.58875)	(0.00033)
	[0.28066]	[-0.26611]
D(MW(-1))	-2818.698	-0.112014
	(1373.64)	(0.76248)
	[-2.05200]	[-0.14691]
D(MW(-2))	-1160.159	-0.193946
	(1021.51)	(0.56702)
	[-1.13573]	[-0.34205]
C	34144.24	-0.231758
	(14640.7)	(8.12677)
	[2.33214]	[-0.02852]
R-squared	0.637449	0.467156
Adj. R-squared	0.335324	0.023120
Sum sq. resids	1.37E+09	421.4350
S.E. equation	15098.54	8.380881
F-statistic	2.109882	1.052067
Log likelihood	-128.3366	-38.37982
Akaike AIC	22.38944	7.396636
Schwarz SC	22.63189	7.639089
Mean dependent	22562.69	-0.583333
S.D. dependent	18519.53	8.479476

		Table 6...
Determinant resid covariance (dof adj.)	1.14E+10	
Determinant resid covariance	2.85E+09	
Log likelihood	-164.6822	
Akaike information criterion	29.78037	
Schwarz criterion	30.34610	

In the table above it is clear that the error correction coefficient for the cointegrating equation 1 is positive (0.171969). The coefficient is confirmed significant since the T-statistic = (2.26233) which is greater than the critical value of T= 1.96. The value of R^2 was 0.63 which implied that equation is explained by the model. The log-likelihood shows the likelihood that the model explains the model explains the relationship real wage bill with minimum wage.The Akaike information criterion (AIC) is an estimator of the quality of statistical models for the data hence AIC provides a means for model selection. In the ECM the akaike criterion seem to agree with the schwarz criterion and hence proves the reliability of the model as they are 29.7 and 30.3, respectively.

Table 7: Error Correction Results for Equation 2 (WB=f (inflation) +e)

Vector Error Correction Estimates		
Standard errors in ( ) & t-statistics in [ ]		
Cointegrating Eq:	CointEq1	
SER01(-1)	1.000000	
SER03(-1)	1004.816	
	(4207.75)	
	[0.23880]	
C	-236718.9	
Error Correction:	D(SER01)	D(SER03)
CointEq1	0.285529	-5.51E-05
	(0.14736)	(4.2E-05)
	[2.19769]	[-1.30908]
D(SER01(-1))	-0.394725	6.89E-05
	(0.52765)	(0.00015)
	[-0.74808]	[0.45659]
D(SER01(-2))	-0.168254	-1.35E-06
	(0.63305)	(0.00018)
	[-0.26578]	[-0.00744]
D(SER03(-1))	266.5643	-1.009190
	(866.960)	(0.24784)
	[0.30747]	[-4.07199]

Table 7...

D(SER03(-2))	836.3134	-0.683114
	(883.369)	(0.25253)
	[0.94673]	[-2.70510]
C	33818.05	-0.897938
	(16169.9)	(4.62247)
	[2.09142]	[-0.19426]
R-squared	0.582640	0.758104
Adj. R-squared	0.234840	0.556525
Sum sq. resids	1.57E+09	128.6761
S.E. equation	16199.67	4.630985
F-statistic	1.675216	3.760820
Log likelihood	-129.1813	-31.26161
Akaike AIC	22.53022	6.210269
Schwarz SC	22.77267	6.452722
Mean dependent	22562.69	0.408333
S.D. dependent	18519.53	6.954065
Determinant resid covariance (dof adj.)		3.61E+09
Determinant resid covariance		9.02E+08
Log likelihood		-157.7734
Akaike information criterion		28.62889
Schwarz criterion		29.19462

In the table above it is clear that the error correction coefficient for the cointergating equation 2 is positive (0.285529). The coefficient is confirmed significant since the T-statistic = (2.19769) which is greater than the critical value of T= 1.96.The value of R^2 was 0.58 which implied that 58 percent of the equation is explained by the model. The log-likelihood shows the likelihood that the model explains the relationship between wage bill and inflation. In the ECM the akaike criterion seem to agree with the schwarz criterion and hence proves the reliability of the model as shown by the values 28.6 and 29.6, respectively.

Table 8: Error Correction Results for Equation 2 (WB=f (No of workers)+e)

Vector Error Correction Estimates
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
SER01(-1)	1.000000
SER04(-1)	6.460290
	(2.11955)
	[3.04796]
C	-4430595.

Error Correction:	D(SER01)	D(SER04)	
CointEq1	-0.199194	-0.160439	Table 8...
	(0.11489)	(0.09968)	
	[-1.73374]	[-1.60950]	
D(SER01(-1))	0.881910	1.391088	
	(0.51499)	(0.44682)	
	[1.71248]	[3.11333]	
D(SER01(-2))	0.637551	0.490554	
	(0.81734)	(0.70914)	
	[0.78003]	[0.69176]	
D(SER04(-1))	0.927818	8.62E-05	
	(0.57868)	(0.50207)	
	[1.60334]	[0.00017]	
D(SER04(-2))	0.720387	-0.004084	
	(0.39030)	(0.33863)	
	[1.84574]	[-0.01206]	
C	-7627.187	-35212.52	
	(19823.3)	(17199.1)	
	[-0.38476]	[-2.04735]	
R-squared	0.572866	0.652903	
Adj. R-squared	0.216921	0.363655	
Sum sq. resids	1.61E+09	1.21E+09	
S.E. equation	16388.26	14218.78	
F-statistic	1.609423	2.257245	
Log likelihood	-129.3202	-127.6162	
Akaike AIC	22.55337	22.26937	
Schwarz SC	22.79582	22.51182	
Mean dependent	22562.69	3500.000	
S.D. dependent	18519.53	17824.45	

Determinant resid covariance (dof adj.)		3.41E+16
Determinant resid covariance		8.52E+15
Log likelihood		-254.1408
Akaike information criterion		44.69014
Schwarz criterion		45.25586

In the table above it is clear that the error correction coefficient for the cointergating equation 3 is negative (-0.199194). The coefficient is confirmed insignificant since the T-statistic = (-1.73374) which is less than the critical value of T= 1.96. 57 percent of the equation is explained by the model as shown by an R^2 of 57%. The Akaike information criterion estimates the quality

of statistical models for the data. In the ECM the akaike criterion seem to agree with the schwarz criterion and hence proves the reliability of the model as shown by the value of 44.7 and 45.2 respectively

DISCUSSION

Government Structures

Government structures measured in terms of the number of workers was statistically significant with a positive coefficient implying that as the number of workers increased, the wage bill equally increased. This finding supports Okech & Lelegwe (2015) whereby it was noted that following the promulgation of a new constitution in 2010, a number of offices were created including the Senate arm of Parliament and the increase in the members of National Assembly from 222 seats to 349, while at the same time created political positions for county women representatives aimed at promoting gender representation. The constitution further provided for gender consideration whereby there was no more than two thirds of one gender in appointive and elective offices leading to the provision of nomination positions targeting the female gender. Additionally, with the Constitution, commissions were created with the aim of enhancing service delivery. For instance, the constitution created the Parliamentary Service Commission (PSC), Teachers Service Commission (TSC), Judicial Service Commission (JSC) and Public Service Commission (PSC) which generally do the same thing for different types of employees of the same National Government (GoK, 2010).

Similarly, these commissions, although independent, seem not to supposedly have the ability to fairly and justly determine the salaries of their respective employees in line with the economic realities. In this regard, the Salaries and Remuneration Commission (SRC) was created to help them do that minor function. The Commission of Revenue Allocation (CRA) and the Controller of National Budget (CNB) can also do the work of the other. Since the constitution had to be implemented, Parliament created a committee in charge of implementing the constitution, while at the same time also decided to have a commission to do the same work in the name of the well paid Commission for the Implementation of the Constitution (CIC). In summary there are a myriad of commissions (with full secretariat) for the various departments of Government carrying out duties and roles that the Public Service Commission as had been the case. For the commissions to functions however, they require a full secretariat given the number, of the commissions created by the constitution, this is expected to have an impact on the share of revenue consumed in terms of salaries and wages (Okech &Lelegwe, 2015).

Similarly, the constitution created a devolved government structure thereby creating forty seven (47) Governors and their forty seven (47) deputies notwithstanding their respective secretariat and support staff (GoK, 2010). Also, the offices of County Commissioners and regional coordinators who are the representatives of the National Government at the County and regional levels and their respective secretariat further increased the number of workers thereby contributing to increased wage bill. Additionally, though the National Government supposedly trimmed down the Cabinet, other offices were created that the country may not necessarily require. Among these include offices such as Political Adviser to the President and the office of Digital Media and Diaspora (and their respective secretariat) whose functions can be carried out by the Ministries of Information and Communication Technology (ICT) and Foreign Affairs, respectively (Okech, 2014).

Statistics show that Kenya has a total workforce of twelve (12) million, ten (10) million of whom are in the informal sector. The remaining two (2) million make up the formal sector which is comprised of the government civil service jobs, parastatals as well as the private sector (KIPPRA, 2013). It is estimated that Kenya currently has a civil service workforce of about 700,000. According to KIPPRA (2013), this is one of the largest public work force compared to other sub-Saharan African (SSA) countries that are relatively at par with Kenya in terms of the rate of economic growth and development. The situation is made worse by the existence of "ghost" workers both in the national and county governments based on recent head count and audit of the workers (GoK, 2014; KIPPRA, 2013).Additional in a report by IEA (2014), it was noted that a lot of money has been and is still being paid to non-existent workers, or those who have left service, or even those who do not work in the civil service but whose details are in the governments' payroll. This audit is expected to go a long way in helping reduce the wage bill as it will curb wastage and misuse of public funds (IEA, 2014). Additionally, sections of the public sector are represented by active unions, which articulate demands for the central government to raise wages of their members. The mainstream civil service workers, primarily of the lower cadres, are represented by the Union of Kenya Civil Servants.

Inflation and Wage Bill

In the study, it was rejected that inflation has no significant relationship with real wage bill which therefore meant that inflation in deed does affect wage bill. This is because with inflation, workers realize a decline in their wages and in the process through either their trade unions seek salary increase which in the recent past has contributed to the ballooning of wage bill in the country. A study by Groshen & Schweitzer (1997) established that wage adjustments operate most immediately at low inflation rate. It was contended that inflation generated

disruptive and unintended wage variations which continued to mount until inflation reached the rates of 7 to 10 percent. The study further concluded that labour market provides little guidance on the preferred low inflation target. Lemos (2004) also found that increasing the minimum wage increases wages and prices with small adverse employment effects in Brazil. The findings imply a general wage price inflationary spiral where the perpetual increase in inflation repeals some of the initial positive wage effects. The study concludes that the eventual increase of minimum wage is dependent on inflation. This study mainly focused on minimum wage unlike the current study where real wage will be considered using time series.

Cuong (2011) contended that increase in monthly inflation was triggered by increase in consumption demand during the New Year festival which coincides with minimum wage increases. The study also found that there have been 9 increases of the minimum wage since 1994. According to Cuong (2011) the real minimum wage increased by around 118 per cent while the CPI increased by 254 per cent during the period 1994 to 2009. The study established that the point estimates of both the short-run and long-run effects of minimum wage increase were negative implying that the estimates were not statistically significant at 5 per cent. The main weakness of the study by Cuong (2011) is that it did not take into consideration other variables that might affect real wages such as the minimum wage and government structures which will be considered in this study.

Minimum wage and Wage Bill

The study has established that this variable had significant relationship with real wage bill in the country. This finding relates to the descriptive results where it was found that the government has over the study period continued to spend on pensions following the structural adjustment programmes in terms of employment and the social protection schemes initiated in the 2000s to boost the marginalized groups especially the elderly and the persons living with disabilities. In Kenya, as reported elsewhere the government introduced the schemes in June 2011starting with then Nairobi, Nyanza and Eastern provinces (GoK, 2003; Mango *et al.*, 2007). The aggregate payments over the period were very limited and practically stagnant. Most striking are the findings that the poorest quintile lost out in absolute terms and gains for the second bottom quintile were only about one percent annually. Mango *et al* (2007) notes that the underlying levels of inequality, although there is positive momentum in some key respects, including with respect to market access through improved infrastructure and diversification of farm and off-farm activities.

CONCLUSION

Kenya's recurrent expenditure in general and real wage bill in particular is soaring and urgent strategies need well thought out by the government in consultation with relevant stakeholders including trade unions, need to reverse the trend. If the trend continues, the country is likely to fall short in the realization of Vision 2030 commitments. The country is likely to not only suffer in terms of international competitiveness, but also budget deficit which may plunge the country into monumental public debt. Similarly, low developmental expenditure may impact negatively on economic growth and improved welfare of the populace; and unemployment as the employers will not afford the high wage bill and may resort to automation. From the study number of workers, minimum wage and inflation account for a higher consideration in the variations in real wage bill with inflation and minimum wage significantly affecting real wage bill over the study period.

Managerial Recommendations

In terms of managerial implications, it is recommended that there is need to fast track the review and implementation of staffing norms at both county and national government in consultation with key stakeholder including trade unions. This is because number of workers, minimum wage and inflation account for the variations in wage bill. Thus a functional review of the government departments and organizations can expose areas of duplication, and identify non-core functions which can be outsourced. This will require rationalization of various government departments to weed out duplication of work which means double pay. Additionally, SRC should undertake a comprehensive review of the salaries of workers by engaging all stakeholders in line with the current macroeconomic trends especially inflation and the economic performance of the county measured by its gross domestic product. Salaries and wages may need to be pegged on job responsibilities and productivity and where possible some merged, redesigned, or eliminated. This way, minimum wage guidelines that many a times are considered populist in nature will be addressed. In these undertakings, safeguards should be put in place to ensure that no employee is disadvantaged through decreases in pay with some job groups, especially in the lower cadres, merged or re-graded where possible.

Policy Recommendations

For policy purpose, constitution reforms are necessary aimed at reducing the number of non-productive state office such as the number of National Assembly, County Assembly, Constitution Commissions as well senior government offices where there are cases of duplication of duties. As a country, we do not have to employ people who work less than an

hour daily on a full time basis. Some of these employees earn more on sitting allowance than most Kenyans earn after 30 days of hard labor. Thus a consideration should be made whereby commissioners are paid per sitting and productivity as opposed to monthly pay out. Similarly, SRC need to lead the review of the wage policy by engaging all stakeholders to avoid legal issues that will eventually affect the implementation process. Although the existing performance contracting is a fairly good measure of productivity upon which minimum wage may be anchored, it does not effectively cascade to individual employees especially in the lower cadres. In terms of inflation, the government may need to put in place necessary measures aimed at curbing inflation in the country. This will require implementation of supply side policies that are necessary in encouraging productivity and hence economic growth. The Kenyan government in collaboration with employer's representatives, consumer federation and social partners undertake appropriates measures to harmonize wages based on the changes in prices over time.

Scope Further Studies

This study was undertaken from a national perceptive by addressing the factors that influence real wage in the public sector in terms of inflation, minimum wage and number of workers. It will be necessary for a comparative study to be undertaken between counties and where possible between departments. Similarly, a few policy changes have been initiated by Salaries and Remuneration Commission regarding wage bill therefore, it will be necessary for such changes to be incorporated and how these have impacted on wage bill in the country. It is also suggested that a study is conducted to analyze the empirical impact of wage bill on the implementation of the various socio-economic projects envisaged under the vision 2030 and operationalized in the Medium Term Expenditure Framework (MTEF).

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