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A Study on the Forecasting of Employment Demand in Kenya Logistics Industry

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Abstract : *This study focused on the alternative to estimate the demand of employment in Kenya logistics. First of all, it investigated the importance and necessity of search about the present circumstance of the country's industry. Next, it reviewed respectively the concept and limitation of several previous models for employment, including Bureau of Labor Statistics, USA; ROA, Netherlands; IER (Institute for Employment Research), UK; and IAB, Germany. In regard to the demand forecasting of employers in logistics, it could anticipate more realistically the future demand by the time-lag approach. According to the findings, if value of output record 733,080 KSH million in 2015 and 970,640 in 2020, compared to 655,222 in 2013, demand on wage employment in logistics industry would be reached up to 95,860 in 2015 and 104,329 in 2020, compared to about 89,600 in 2012. To conclude, this study showed the more rational numbers about the demand forecasting of employment than the previous researches and displayed the systematic approach to estimate industry manpower in logistics.*

Key words : *Demand estimation, Forecasting employment, Regression analysis, Kenya logistics industry, Time-lag model*

1. Introduction

African economy, sharing about 14.8% of world population has been steadily growing, and characterized as newly emerging market for development and investment. Otherwise, previous studies and economists also defined repeatedly that Africa has a growth possibility, though there are a lot of challenges to be solved for realizing its possibilities. ECA forecasted that in 2034, volume of African GDP and composition in the world economy will record nearly quadrupled and double. As a result, the growth possibility of African economy will lead to a necessity for improvement of social and logistics infrastructure.

Most of previous studies presented only the importance of Africa as logistics hub and policy making relevant to it. Especially most of African countries are under poor logistics infrastructure and it is difficult to use some information with relevance due to social infrastructure. In these points of view, this study-especially focused on Kenya, tries to find out strategies of logistics employment based on the prospect of national economic situation and these strategies were not investigated by the other studies. Moreover, according to KITA's report, Kenyan logistics industry was reported to have a significant position among African countries and it is a one reason that this study tries to focus on Kenya.

Kenya in Africa characterized as most modernized economy, more stabilized country in terms of political and economic situation, most attractive business environment having, and mostly powerful long-term development plan implementing. These characteristics are playing a background of achieving the national development's goals —Vision 2030 (Nyarandi, 2012). These national situations suggest that Kenya can provide other African countries with a direction of national development as the best role model and lead them.

Consequentially, it cannot be emphasized enough the

Note) This paper is revised version of an earlier paper presented to KMOU International Exchange & Cooperation Project for Shipping, Port and International Logistics, in November, 2013. The paper was published as the title : Study on prospecting of Africa's logistics industry and developing human training program in the logistics sector focusing Kenya in east Africa.
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fact that Kenya logistics industry survey is timely and important, and forecasting of its future employment is also useful. Namely, the purpose of this study is to suggest a kind of approach with reality to forecast of the logistics employment.

Additionally, all of data was collected from Kenyan government web site, National annual reports, international organization publications and other previous studies. Also, a regression method was actually used to estimate logistics employment.

2. Status of Kenya Logistics

2.1. Kenya in general

According to Kenya Facts and Figures of Kenya National Bureau of Statistics(2012), Kenya, a former British colony, is located in east Africa, bordering the Indian Ocean to the east, Somalia to the northeast, Uganda to the west and Tanzania to the south and has a total area of 582,650 square kilometers with a coastline of 536 kilometers.

The population of Kenya increased less than double from 28.4 million in 1997 to 42.7 million in 2012 and is highly heterogeneous, such as the Kikuyu, the Luhya, the Luo and the Kalenjin etc. Population density in Kenya is higher than other African countries but land area constitutes only 1.9 % of total African land area.

Kenya is the largest and most advanced economy in East Africa as the economic leader in the region. Since independence in 1963, Kenya has pursued at various times import substitution and export oriented industrialization strategies, outlined in Sessional Paper No. 2 in 1996.

Kenya also has a plan to upgrade and extend the country's infrastructure and encourages the foreign direct investment. Redevelopment of the Northern Corridor, Development of a commuter railways system around Nairobi, Building of a standard gauge line to replace the current Kenya-Uganda railway, Design and Construction of a new terminal at Jomo Kenyatta International Airport and Development of a new corridor from Lamu to South Sudan and Ethiopia (LAPSSET) are included in this plan (Njiru, 2011).

According to The 2012 UNCTAD Investment Guide to Kenya, Kenya faces several key structural challenges, most notably the absence of a reliable and affordable power supply. Many companies invest in costly backup generators to ensure a steady supply of electricity. Tax administration is another significant concern. Investors often face delays in obtaining VAT and other withholding refunds, and the customs clearance process can be drawn out as goods are subject to a multiplicity of inspections. Insecurity driven by domestic and foreign factors is another major concern, though the Kenyan government has taken important steps recently to improve its ability to monitor and respond to security incidents.

In political issues, military plays a key role in regional operations against Al Shabaab and religious tension have increased since the onset of the Kenyan military operation in Somalia. Uhuru Kenyatta as president and William Ruto as vice president have elected in March 2013 without any crisis(Blanchard, 2013).

2.2. Economy and Industry

Kenya's economy is the largest and most diverse in East Africa and has experienced moderate growth of 4.2% in 2012, mainly driven by construction, agriculture and financial intermediation. According to African Development Bank Group(AfDB), the economy is expected to reach 5.2% in 2014 but not enough to address the country's development needs. While other African countries recorded CAGR of 1.6% by 2012, Kenya shows 4.2%.

Inflation, poor logistics infrastructure, inadequate power supply and high fuel and electricity costs continue to hamper multiple sectors. Otherwise, Kenya government is trying to pursue privatization, deregulation, and trade liberalization are ongoing, but high tariff rates continue to hinder investment. Kenya's ranking in the World Bank's Doing Business 2013 report fell four places to 121st out of 185 countries, placing it behind Uganda's less sophisticated economy and in 10th place among sub-Saharan African countries.

According to African Economic Outlook, the 2012 Fitch Rating remained a B+ for long-term foreign debt, B for short-term foreign debt and BB for domestic long term foreign debt. Generally, recent Kenya's economic development has relied on small and medium-sized enterprises(SMEs) and SMEs have contributed to 445,900 jobs creating in 2011. But many of barriers, such as poor infrastructure, finding the right quality of staff and access to adequate credit and financing have still remained to be solved.

Generally, the most common industries in Kenya includes; small-scale consumer goods (plastic, furniture,

batteries, textiles, clothing, soap, cigarettes, flour), agricultural products, horticulture, oil refining, aluminum industries, steel industries, lead industries, cement industries, commercial ship repair. Their statistics shows the composition percentage of GDP by sector. Agriculture, hunting and fishing sectors consist of main industry, recording 27.7% of GDP composition in 2011.

Otherwise, transport, storage and communications sectors shares only 11.0 % of total GDP but Kenya places emphasis on improving transport sector as a key pillar and a critical enabler in the successful implementation of Kenya's long term development strategy, Kenya Vision 2030. Industries in Kenya's manufacturing sector mainly engage in processing agricultural, metal, electrical and chemical products and fast consumer goods. The building and construction sector has been a key driver of economic growth in recent years. The private sector has invested heavily in real estate and the government has embarked on a substantial infrastructure development program targeting increased investments in road networks and provision of affordable housing.

The latest value for total trade volume in Kenya was 22,417 million US dollars, showing 15.5% of CAGR. Exports volume has increased more than double from 2,411 million US dollars in 2003 to 6,127 million US dollars, representing 10.9% of CAGR. Imports volume has grown almost 4 times from 3,725 million US dollars in 2003 to 16,290 million US dollars in 2012 and it shows about 18 % of CAGR. The growth rate of imports recorded 17.8 % of CAGR and is higher than the growth rate of exports.

3. Existing Theoretical Models

3.1. Bureau of Labor Statistics, US

Bureau of Labor Statistics projections[1] of industry and occupational employment are developed in a series of six interrelated steps, each of which is based on a different procedure or model and assumptions: labor force, aggregate economy, final demand (GDP) by consuming sector and product, industry output, industry employment, and employment and openings by occupation. The results produced by each step are key inputs to following steps, and the sequence may be repeated multiple times to allow feedback and to ensure consistency. BLS's model of employment projections is summarized by Figure 1.

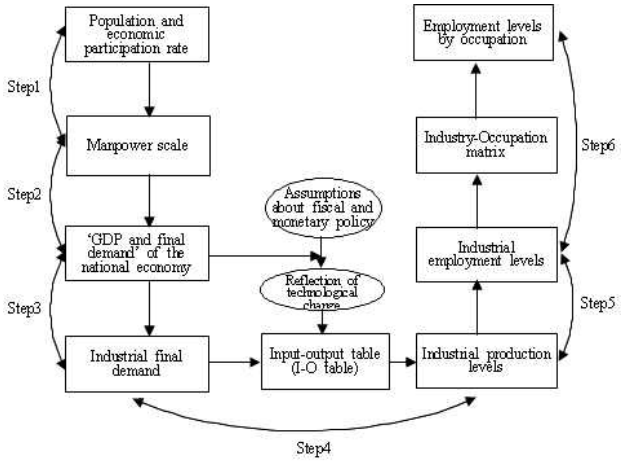

Fig. 1 BLS's model of the employment projections

To be short, over the years, the BLS employment projections have undergone many changes as new data series became available and as economic and statistical tools improved. Since the late 1970s, however, the basic methodology has remained largely the same. Procedures have centered around projections of an inter-industry, or input-output, model that determines job requirements associated with production needs, and the National Employment Matrix, which depicts the distribution of employment by industry and occupation. Projecting employment in industry and occupational detail requires projections of the total economy and its sectors. BLS develops its projections in a series of six steps that examine;

(a) the size and demographic composition of the labor force
(b) aggregate economic growth
(c) commodity final demand
(d) input-output
(e) industry output and employment
(f) occupational employment and openings.

Each step, based on separate procedures and models and on related assumptions, goes through several iterations to ensure internal consistency as assumptions and results are reviewed and revised. Together, the six components provide the analytical framework needed to develop detailed employment projections. BLS analysts solve each component sequentially.

1) A detailed description of BLS projections methods is available at http://www.bls.gov/emp/ep_tech_documentation.htm

3.2. ROA, Netherlands

According to Grip and Heijke (1998), for the Netherlands the Research Centre for education and the labor market, ROA (Researchcentrum voor Onderwijs en Arbeidsmarkt), biennially publishes the report The labor market by education and occupation to 2000, which includes analyses of expected labor-market developments in the light of particular policy issues. Since the matching problems between labor supply and demand can be regional in nature, ROA conducts forecasts for three Provinces of the Netherlands, Limburg, Gelderland and Overijssel, which are published in reports that are largely comparable to the national report. The regional labor-market forecasting by occupation and education is based on the methodology used to forecast national labor-market developments. An advantage of this approach is that the forecasts for the regional demand and supply are consistent with the national forecasts.

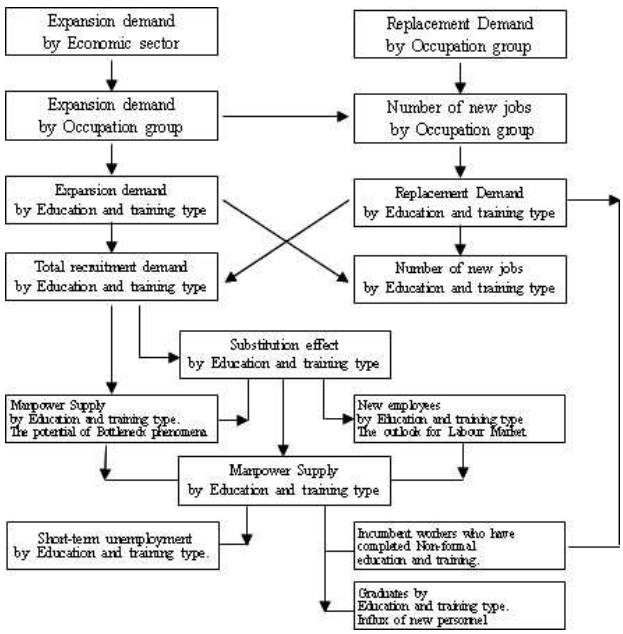

Fig. 2 ROA's labor market model

The information function originally focused on study and career guidance. This improves the functioning of the labor market, since individuals are more able to adjust their human capital investment decisions to labor-market prospects of types of education according to Borghans(1993). Also firms and labor-market agencies may use labor-market forecasts as 'early warnings' on future recruitment problems to outline human resources policies or to design training programs. To sum up, ROA's model has some features as follows:

(a) emphasis on the information functions

(c) high reliability of predictions by reflecting the positive and/or negative alternation of labor market as dividing the demand of labour force into the development demand and substitution demand

(d) stress on the qualitative predictions about the future labour market

3.3. IER(Institute for Employment Research), UK

According to Michael and Schömann(2002), the Warwick Institute for Employment Research,[2] IER was founded in 1981 and is internationally recognized for its labor market expertise for the UK and the EU. Its regular Review of the Economy and Employment has become a standard reference for UK labor market analysis.

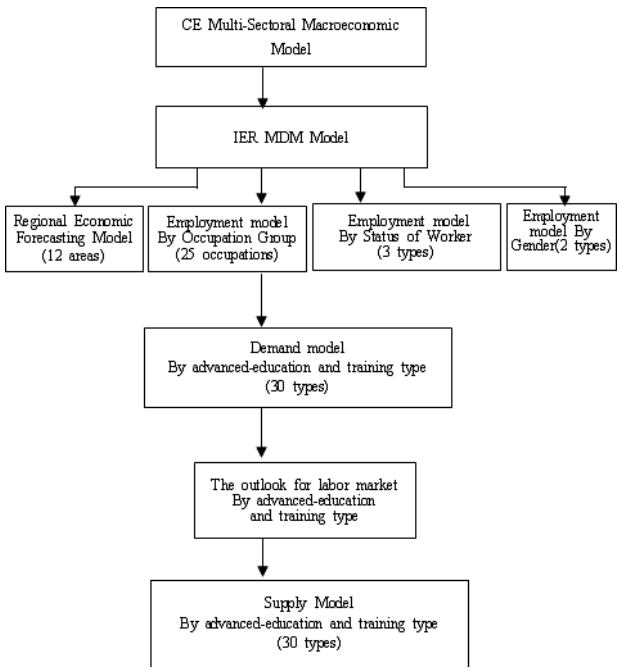

Fig. 3 IER's local economy forecasting model, LEFM

IER's work on local area forecasting forms part of its Local Development and Human Resources program, which combines data analysis of local labor markets with applied work (skills audits, employer surveys, labor market assessments) principally for TECs/LECs, local authorities

2) See the website, http://www2.warwick.ac.uk/fac/soc/ier/software/lefm/

and the Department for Education and Skills. The program also incorporates a training course for labor market analysts. The model is presented by Figure 3.

To sum up, LEFM is a custom built computer package designed to enable users to produce their own economic projections for local areas within the UK. It provides a more complete economic picture of the local area covering various key economic indicators and a number of labour market indicators as well as employment.

3.4. IAB, Germany

The Institute for Labour Market and Employment Research, IAB (Institut für Arbeit und Berufsforschung) in Nürnberg in 1967 as a research institute of the German Federal Institute for Occupational founded.

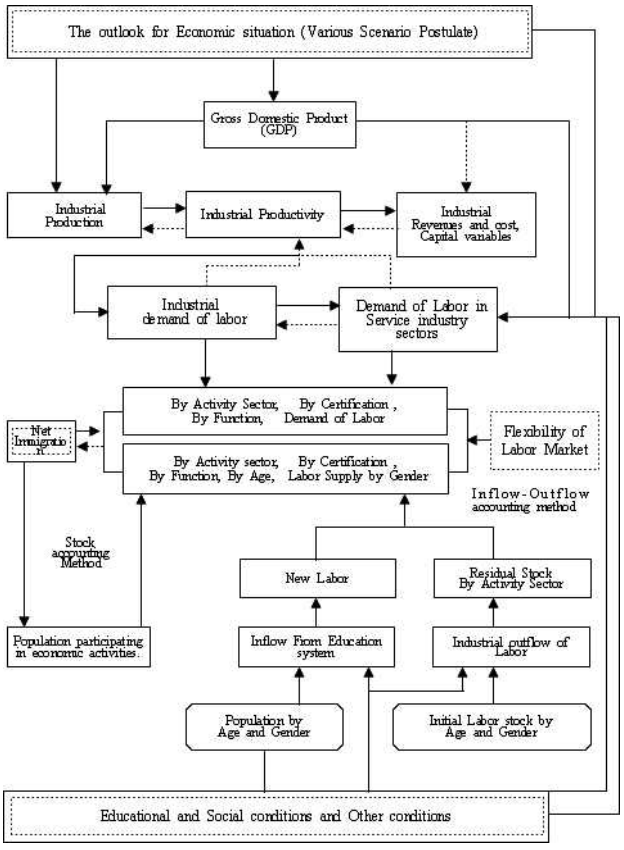

Fig. 4 IAB's model

It studies the labor market on the basis of two legal orders, which are regulated in the field of unemployment insurance in the SGB III and for the basic security for job seekers in the SGB II. The IAB making its research results available to the public and gives independent advice to policy and practice(Tessaring, 1993).

The profile of the IAB dominated since its inception four directors and a director. The IAB is a member of the working group of the federal research facilities. To sum up, IAB's model has some features as follows:

(a) reference to the governmental policy
(b) predictions the demand by field of activity in lieu of the demand of employment by the occupational group
(c) difficulty of the quick response to rapid change of circumstance or environment due to long-term model
(d) using complementarily SYSIFO (System for simulation and forecasting)

4. Research Model and Analysis

4.1. Forecasting Model

In order to heighten the power of forecasting about the employment, this study determined it has to apply various macro-economic indices and individual industry indicators besides an output variable like GDP into the model as factors to affect the employment by the inductive approach considering the characteristics of corresponding industry. Figure 5 gives the process to forecast employment in Kenya logistics industry.

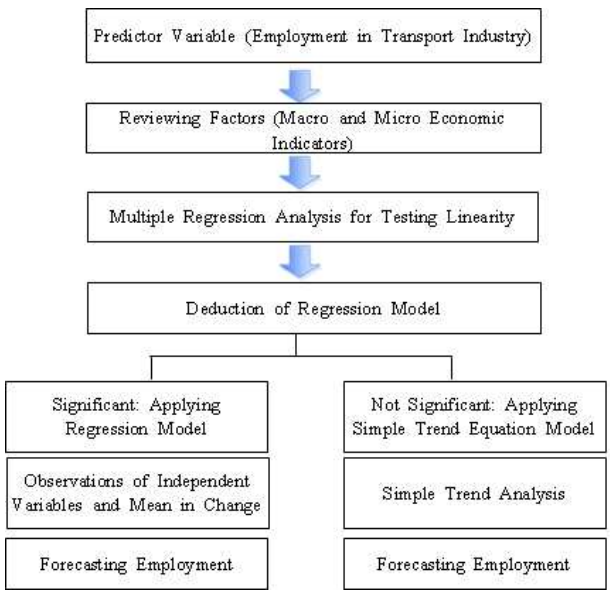

Fig. 5 Forecasting Model in Logistics Industry

This model differs from four models of existing researches in terms of focusing on individual industry

indicators. It would be useful to forecast short or mid term employment due to a kind of statistical approach of regression equations with high coefficient of determination.

4.2. Predictor Variable and Reviewing Factors

First of all, Table 1 presents the wage employment in the private sector by the transport over 2007 to 2011. According to this diagram, total number of the wage employment started decreasing steadily, bottoming in 2009, and rose sharply in 2011.

Table 1 Wage employment in the private sector by industry, 2007-2011 (unit : no.)

year	2007	2008	2009	2010	2011
Railway transport	3,385	2,582	2,677	2,777	2,877
Urban, sub-urban and inter-urban highway passenger transport	11,106	10,304	10,007	10,271	10,341
Other passenger land by road	11,580	11,299	11,399	11,358	12,022
Freight transport by road	11,408	12,037	11,305	11,299	11,535
Pipeline transport	1,596	1,586	1,579	1,588	1,645
Supporting services to land transport	190	199	201	200	198
Ocean and coastal water transport	733	751	747	740	736
Inland water transport	300	295	295	286	285
Supporting services to water transport	9,830	9,976	10,095	9,947	10,183
Air transport caries including aircraft rental	4,736	4,940	5,260	5,874	6,593
Supporting services to air transport	4,484	4,752	4,442	4,654	5,000
Booking and travel agencies	2,522	2,551	2,787	2,931	3,113
Services incidental to transport n.e.c	4,015	4,207	4,208	4,156	4,178
Storage and warehousing	6,417	5,529	5,733	6,301	7,010
Total	72,302	71,008	70,735	72,382	75,716

Source: Annual Economic Survey, Kenya National Bureau of Statistics, 2007~2011.

Next, Table 2 shows the wage employment in the public sector by the transport over 2007 to 2011. The diagram depicts that total number of the wage employment started decreasing, bottoming in 2008, and rose gently in 2011.

Table 2 Wage employment in the public sector by industry, 2007-2011 (unit : no.)

year	2007	2008	2009	2010	2011
Railway transport	3,385	2,582	2,677	2,777	2,877
Urban, sub-urban and inter-urban highway passenger transport	420	413	423	425	431
Other passenger land by road	402	413	423	425	431
Pipeline transport	1,596	1,586	1,574	1,588	1,645
Supporting services to land transport	21	22	22	22	22
Ocean and coastal water transport	146	144	142	137	136
Inland water transport	300	295	295	286	285
Supporting services to water transport	7,083	7,098	7,359	7,292	7,445
Air transport caries including aircraft rental	146	130	122	113	106
Supporting services to air transport	1,910	2,195	2,182	2,407	2,632
Services incidental to transport n.e.c	739	735	739	720	722
Total	16,163	15,629	15,974	16,210	16,751

Source: Annual Economic Survey, Kenya National Bureau of Statistics, 2007~2011.

Additionally, Table 3 illustrates that the wage employment in the private and public sector by the transport over 2003 to 2012. There could be cleary defined pattern between transport/communications and transport / storage, and this can be taken to mean that the wage employment over 2003 to 2006 is predicted. The predictions of grand total employment are demonstrated as in the following table.

Table 3 Wage employment by industry and sector, 2003-2012 (unit : no.)

year	2003	2004	2005+	2006+	2007*
PRIVATE SECTOR: Transport					72,413
Transport and Communications	49,200	62,400	75,100	90,900	113,952
PUBLIC SECTOR: Transport					12,889
Transport and Communications	37,600	38,400	38,600	39,900	36,000
Grand total*	56,648	64,416	71,434	81,006	85,302
	2008	2009	2010	2011	2012
PRIVATE SECTOR: Transport	71,111	70,886	72,541	75,892	
Transport and Storage	56,000	55,400	56,900	59,400	61,600
PUBLIC SECTOR: Transport	12,748	12,986	13,176	13,625	
Transport and Storage	14,500	17,000	17,400	17,100	17,300
Grand total*	83,859	83,872	85,717	89,517	

Source: Annual Economic Survey, Kenya National Bureau of Statistics, 2003~2011.
Statistical Abstract 2012, Kenya National Bureau of Statistics, 2012.
* Provisional, (+) Revised

Finally, Table 4 and 5, both indicate the value of output by transport and communications over 2003 to 2012. The transport includes road transport, railway transport, water transport, air transport, services incidental to transport, and pipeline transport. According to the table, the value of output rose steadily during 10 years.

Table 4 Transport and communications: value of output, 2003-2007 (unit : KSH million)

year	2003	2004	2005	2006	2007
Road Transport	110,899	143,267	159,321	201,672	233,224
Railway Transport	4,609	4,674	4,600	4,556	4,550
Water Transport	11,296	13,187	17,204	21,475	23,233
Air Transport	36,871	46,512	59,670	63,996	80,254
Services Incidental to Transport	13,521	17,947	20,480	29,204	33,971
Pipeline Transport	6,761	7,386	8,270	8,750	8,736
Communications	51,699	55,691	62,687	68,721	88,691
Total	235,656	288,664	332,231	398,370	472,659

Source: Annual Economic Survey, Kenya National Bureau of Statistics, 2003~2011.
Statistical Abstract 2012, Kenya National Bureau of Statistics, 2012.
* Provisional.

Table 5 Transport and communications: value of output, 2008-2012 (unit : KSH million)

year	2008	2009	2010	2011	2012*
Road Transport	273,044	285,262	326,318	388,013	402,452
Railway Transport	4,449	4,747	5,591	2,992	6,048
Water Transport	21,868	21,039	21,483	22,117	29,705
Air Transport	83,010	81,609	84,257	99,176	104,137
Services Incidental to Transport	38,822	40,019	47,977	59,161	59,947
Pipeline Transport	9,222	11,837	13,906	14,174	17,162
Communications	93,426	100,705	105,951	107,502	117,179
Total	523,841	545,218	605,483	693,135	736,630

Source: Annual Economic Survey, Kenya National Bureau of Statistics, 2003~2011.
Statistical Abstract 2012, Kenya National Bureau of Statistics, 2012.
* Provisional.

4.3. Regression

There are some shortcomings in the traditional time series model, also known as input-output model. First of all, this model most likely would show a low statistical significance in case the accumulation of time series data is not sufficient because the period is short, as well as the type of trend through the model would be limitative for the successful estimation due to various range of fluctuation, and different types, for example, diffusion pattern or diminution trend, and so on. The successful estimation, of course, means the high possibility to expect moving similarly as the same pattern for the future time.

The necessity of the mid/long-term estimation by time series model and the importance of the employment estimates cannot be overemphasized. These estimations in the part of employment by industry, however, tend to be intermittently made at five or ten-year intervals by depending only on the typical and formulaic input-output model without the consideration in terms of methodological diversity. In these cases, the feed-back would be almost not given in estimating the employment by particular industries.

No matter what the models are, their usefulness can be primarily proved by the results of the feed-back. In other words, the forecast model not guaranteed the accuracy could lack the usefulness seriously even though the model is based on the rationale through a deduction approach.

A kind of approach to be able to make up flaws of the mid/long-term estimation is the short-term estimation by the time-lag model in this study. If the time-lag model with statistical significance can be established through the past data, it is enough to estimate the employment of industry with only observation of a particular leading indicator by this model.

In summary, the time-lag models to predict the employment by transport industry are as follows,

(1) linearity model $Y_{t+1} = \beta_0 + \sum_{i=1}^{n} \beta_i X_{i,t} + \varepsilon_i$

(2) logarithm model $\ln Y_{t+1} = \beta_0 + \sum_{i=1}^{n} \beta_i \ln X_{i,t} + \varepsilon_i$

Where, a dependent variable Yt+1 means the number of employment next year, and independent variables Xi,t are respectively the i-th discrimination factor in current year t. In this study, the second logarithm model is preferred because the model generally shows higher predictive power, moreover it is for the increase of the ability to normal distribution and the satisfaction of the linearity presumption among variables.

4.4. Leading Indicator

The main point of the approach in this study is to confirm the advance indicators in order to forecast future employment in logistics industry. In fact, there are many indicators characterizing individual industries, which could be observed through this approach, including several variables demonstrating the size of firms, total assets, net equity, sales, and value added. Generally, those size variables have high correlations with the number of employers, that is why, some variables most likely would be determined as one of leading indicators. All of those might be critical indicators each other.

In short, the model in this paper has logical validity, even though its equation is derived inductively, considering the relationship among the employment and firm size variables.

The kind of approach to estimate the employment by industry considering these characteristics must be consecutively conducted every year. If those findings should be accumulated annually, this method could perform a role as the model suggesting some more realistic outcome of forecast concerning the employment.

Moreover, the time lag model to short-term prediction could show various results of simulation about mid/long-term one, at least over 5 or 10 years, by applying the average or recent rate of change of the leading index to the model in order to extend the estimation for the future. Unlike mid and/or long term prediction by trend equations of time series input-output model, this sort of the extension could give feed-back on the outcome annually by newly available data. The feed-back value of the estimation model in this study could strengthen its usefulness.

4.5. Empirical Analysis

Statistical significance of regression

Among the macro-economic indices and micro industrial data, only the prior year value of output is fortunately confirmed as an independent variable with statistical significance according to the regression analysis to estimate the wage employment in transport industry.

$$\ln Y_{t+1} = 7.402168 + 0.301264 \ln X_t + \varepsilon$$

where, Y_{t+1} : wage employment in the year of t+1

X_t : value of output in the year of t

The above regression model has high explanation power because the coefficient of determination is .832, as well as its probability is significant statistically below the 1% of the significance level due to F value of variance analysis, 29.875, and t-value of regression coefficient, 5.465 as shown in Table 6. This table gives the statistical significance of the regression model to estimate the wage employment in logistics and transport industry.

Table 6 Statistical significance of the regression model

R^2	F	coefficient	
		t	probability
0.832	29.875	5.465	0.001

2012 and 2013 estimates of wage employment

Each inputting natural logarithms of value of output in 2011 and 2012, 585,633 and 619,451 KSH million into the regression equation, the numbers of wage employment in 2012 and 2013 are respectively estimated as 89,598 and 91,126 in transport industry of following Table 7.

Table 7 Estimates of wage employment in transport industry, 2012 and 2013

current year	actual value of output	natural logarithm		estimate of wage employment (next year)
		value of output	wage employment	
2011	585,633	13.28045	11.40309	89,598 (2012)
2012	619,451	13.33659	11.42000	91,126 (2013)

Simulation over future years

Based on the fact known to us so far, Figure 6 demonstrates the trend of the value of output in transport except communications, and as showing this diagram, the trend is steadily increasing from 183,957 in 2003 to 619,451 in 2012.

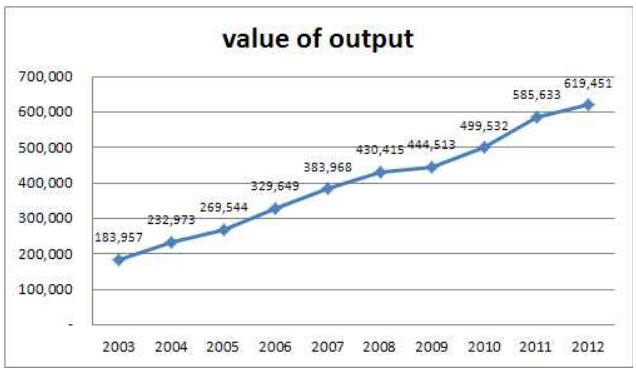

Fig. 6 Trend of transport: value of output, 2003-2012

On the basis of the results, for example, by applying approximately 5.8%, the recent rate of increasing in 2012 to the model, the estimates of output value in current years and employment next years could be calculated continuously as following Table 8.

Table 8 Estimates of wage employment and value of output in transport industry

year	2013	2014	2015	2016	2017
Value of output	655,222	693,058	733,080	775,412	820,189
Next year	2014	2015	2016	2017	2018
Employment	92,680	94,261	95,869	97,504	99,167
year	2018	2019	2020	2021	2022
Value of output	867,552	917,650	970,640	1,026,691	1,085,978
Next year	2019	2020	2021	2022	2023
Employment	100,859	102,579	104,329	106,108	107,918

To conclude, the graph and table can thus be used to predict the estimates of employment, approximately 92,680 to 107,918, during 10 years from now on.

5. Conclusion

This study is a kind of trial approach to estimate the demand of industry employment, focusing on Kenya logistics. The theme cannot be overemphasized. To achieve the research purpose, first of all, this paper has investigated not only the status and prospect of Kenyan logistics industries but also demand prospect of logistics employment based on the national development projects. In consideration of current national situation, Kenyan government project will be implemented systematically and successfully.

As the theoretical background, it mostly reviewed several models; BLS, ROA, IER and IAB. And then it confirmed the limitations and problems of existing models and examined the empirical data with the intention of securing the rationale of this study's remarks.

In demand forecasting, if value of output record 733,080 KSH million in 2015 and 970,640 in 2020, compared to 655,222 in 2013, demand on wage employment in logistics industry would be reached up to 95,860 in 2015 and 104,329 in 2020, compared to about 89,600 in 2012. It is expected that a successful implementation of Kenyan government project will accelerate it than forecasted demand.

In addition, as this paper tried to cover the whole logistics industry of the nation and it would cause low accuracy of forecasting demand. This point could be mentioned as a sort of limitation of the study.

To conclude, this study could show more rational numbers about the forecasting than the other research models and display the systematic approach to estimate employment in logistics industry.

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