

THE IMPACT OF MINIMUM WAGE LEGISLATION
ON EMPLOYMENT IN THE KENYAN
MANUFACTURING SECTOR
(1970 - 2001)

By
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UOVO I'ZNYATTA MEMORIAL

Declaration

This paper is my original work and has not been presented for a degree in any other university

H o* wok
Date


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This research paper has been submitted with our approval as university supervisors

f4r g I ^ Q O
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Dr. Damiano Kulundu Manda

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DEDICATION

To my parents, the late Simon and Felicity for all they ^{^ a v e}
me in life

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Abstract

The impact of minimum wages on the labor market has been a recurrent and controversial issue in the theoretical and empirical literature. Most of the studies have focused on industrialized countries and the few on developing economies are in Latin American countries. By using secondary time series data collected from various government and statistical publications, this study attempts to estimate the impact of minimum wage on employment in the Kenyan manufacturing sector for the period 1970 - 2001. The results suggest a relatively mild unemployment effects in the short-run but no significant impact in the long - run. The results revealed positive employment effects of growth in national output, but a negative employment effect in the sector following increases in imports.

CHAPTER ONE: INTRODUCTION

1.1. Background to the Problem

Minimum wage is a legal wage below which no employer is allowed to pay¹. The "Raison d'etre" of a minimum wage is to protect the lower income earners, especially those not directly affected by the processes of collective bargaining (Vandemoortele, 1984).

Like other aspects of labour market regulation, minimum wage has been one of the most controversial policy instruments among economist and policy makers². On one hand supporters of the policy have argued that the setting of minimum wages improves the economic conditions of low-wage workers, but at the same time minimum wages can eliminate jobs for the same group where employers are unwilling to hire at the minimum wage. This controversy has heightened from the mid 90s with the publication of a book by Card and Krueger (1995) challenging conventional wisdom among economists that there were negative employment effects. In their study they found an increase in employment in the US fast-food industry following an increase in the

minimum wage.

Minimum wage in Kenya

Minimum wages in Kenya have been part of the government's comprehensive policy to regulate the labour market right from independences. According to Vandemoortele (1984) minimum wage has had two fold objectives; *First*, it formed part of the high wage policy pursued by the government in the early 1970s. High wages, by stabilizing labour

force, increasing productivity and enhancing capital intensity of production, were expected to accelerate the pace of industrialization, the major avenue towards economic growths. Secondly, and perhaps more important, has been to protect the workers welfare, in particular low-income earners especially those not involved in the collective bargaining processes.

With the advent of the Structural Adjustment Programmes, especially in the early 1990s, the labour market in Kenya underwent through considerable liberalizations. The minimum wage laws however were left intact in spite of the removal of price controls in the product market. Over the years, adjustments of the minimum wage legislation have traditionally been undertaken virtually every Labour Day (1st of May) with an aim of compensating workers for the erosion of their purchasing powers since the last revision of the wage. The adjustment takes into account the effect of changes in the entire economy and performance of various sectors (Manda, 2002)⁶. The review of minimum wage is done through tripartite agreements (involving ministry of labour, federation of Kenya employers and central organisation of trade unions) with the support of independent members like industrialists and academicians (Manda, 2002). The increase in minimum wage is usually set separately for agricultural workers (in the Agricultural Wage Order) and for urban and other workers (in the General Wages Order). In the collective bargaining, various Wage Councils negotiate their own minimum wages, usually above the general wages order minimum wages (Ikiara and Ndungu, 1997)

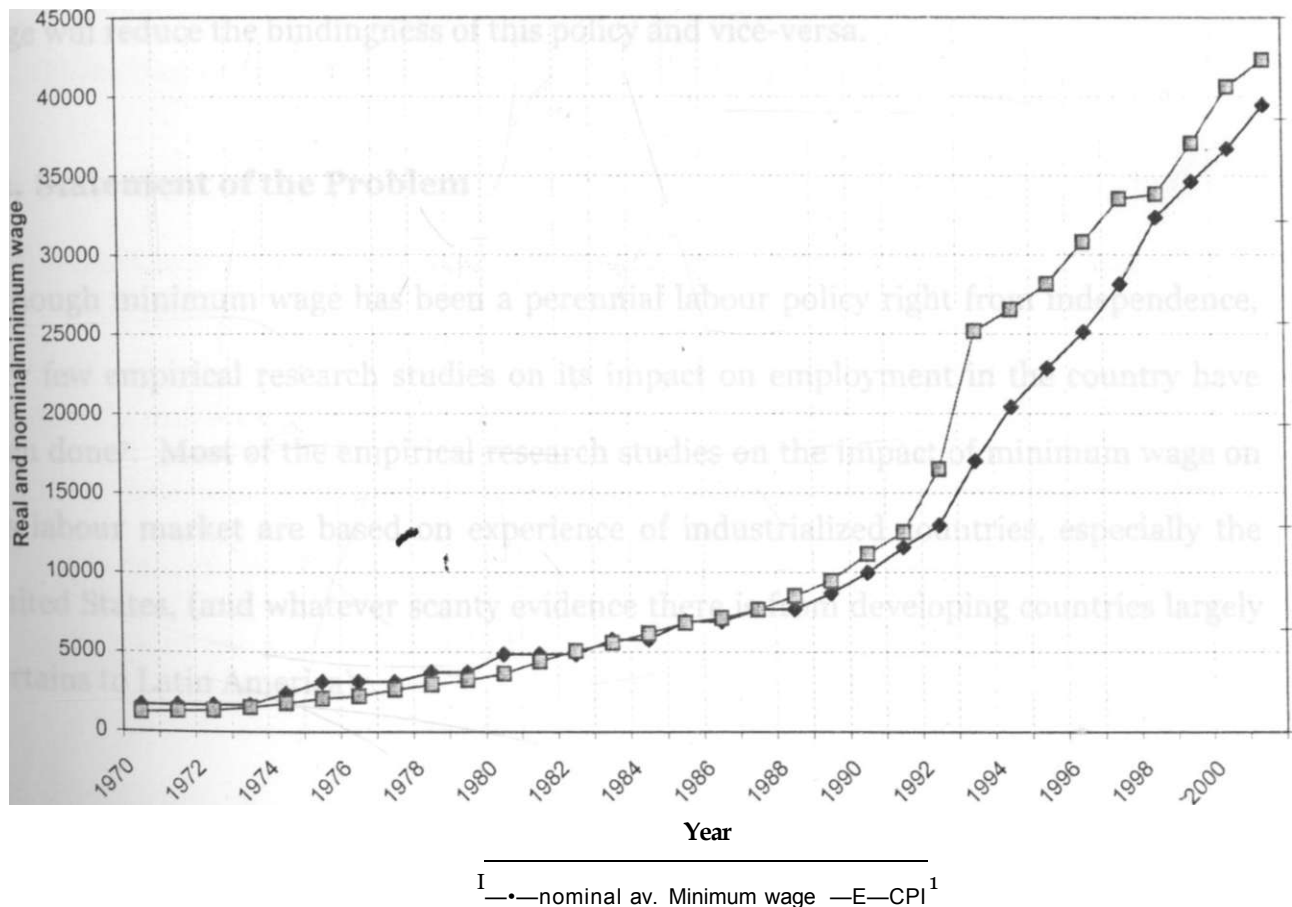
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Trend of minimum wage in Kenya (1970 - 2001)

Whereas Nominal minimum wage has been increasing over the period 1970 to 2001, real minimum wage has generally maintained a downward trend, perhaps an indication that minimum wages have not been fully adjusted to compensate workers for the increased cost of living. **Table 1** (Appendix) **and figure 1** (below), show the trend of Nominal minimum wage (for the General labourer) and the Consumer Price index for the period

Figure 1: Minimum wage and cost of



Source; Various issues of Economic Survey & Statistical Abstract, TCI Ryan (2002)

and own computation

Minimum wage bindingness

The impact of minimum wage on the labour market especially on employment levels (but also on income distribution and labour productivity) depends on a variety of factors and particularly the level at which it is set relative to the average wage (see Vandemoortele, 1984). This can be expressed as the ratio of minimum wage to average wage. According to Vandemoortele (1984) this ratio measures the effectiveness/importance/strength of minimum wage as an instrument of economic policy. The higher this ratio is the more binding the minimum wage is, thus the stronger its' expected impact on the labour market. Increasing average wage relative to minimum wage will reduce the bindingness of this policy and vice-versa.

1.2. Statement of the Problem

Although minimum wage has been a perennial labour policy right from independence, very few empirical research studies on its impact on employment in the country have been done?. Most of the empirical research studies on the impact of minimum wage on the labour market are based on the experience of industrialized countries, especially the United States, (and whatever scanty evidence there is from developing countries largely pertains to Latin America).

However, the generalizability of the industrialized experience to less-developing countries is unclear. On one hand enforcement is weaker in developing countries due to poor administration, the inability by inspectors to carry out adequate inspection of firms and also the high cost of compliance, all of which would suggest that effects minimum wage would be minimised. On the other hand, according to a sample of 17 countries

analysed by the World Bank (1995), there is evidence that minimum wages are less binding in countries with higher per capita national income, which would in turn imply stronger impact of minimum wage on employment in developing countries.

In addition, the few empirical studies on the impact of the policy (on employment) in the country could have been biased as they did not control for factors such business cycle fluctuations, international trade, inflation etc. that may significantly determine employment. Moreover they relate to pre-adjustment period where the economy was less market oriented. (See Vandemoortele and Ngola, 1984)

1.3. Objective of the Study

The main objective of this study is to analyse the impact of minimum wage on employment in Kenya by analysing its impact on the Kenyan Manufacturing Sector.

The specific objective of the study is as follows

- a) To determine the impact of minimum wage on employment in the Kenyan Manufacturing Sector. ¹
- b) Based on the results obtained to outline policy implications

1-4- Justification

The Manufacturing Sector has been chosen partly due to data availability and partly due to the need for accuracy in analysis, a quality which dis-aggregated data has. The manufacturing Sector in this paper is understood as the sum of all the productive

activities classified under the Manufacturing Sector by the Economic Abstracts (1974 onwards)

1.5 Significance

Given the perennial problem of high rates of unemployment on one hand and raising levels of poverty on the other, the critical question with regard to minimum wage hikes is not just the negative employment effects as predicted by most studies (theoretical and empirical), rather it is whether the induced wage increase is worth the job losses. If it (minimum wage) raises the wages of the most poverty stricken at a little cost to employment, then it is a desirable way of redistributing income. It is with this in mind that this study seeks to give an empirical estimate of the impact of minimum wage on employment in the manufacturing sector and thereby provide a basis for deciding on the desirability, timings and levels of minimum wage hikes if any.

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CHAPTER TWO: LITERATURE REVIEW

There is an enormous body of research, both theoretical and empirical, on the impact of minimum wage on employment but mainly from developed countries especially the United States. This section discusses both the theoretical and empirical studies. The theoretical studies have been analysed within the framework of labour market models. Zavodny (1998), Saget (2001), Bugarin & Moller (2002) among others analyse most of the models.

2.1. Theoretical Literature

Basic neoclassical model

The Basic Neo Classical Model is the standard economics textbook model. It has been the basis of theoretical studies such as Stigler (1946), Brown, Gilroy & Kohen (1992), Gramlich (1976) and Card & Ashenfelter (1999) and others, who argue that under perfect competition, if a minimum wage is binding, it will lead employers to move back along their demand curves, causing a reduction in employment opportunities for low skilled workers. The model is based on assumptions of perfect competition, information and choice, with wages set at the market clearing level and reflecting the marginal Productivity of labour.

Neoclassical model with differentiated worker skills

This *

is also known as the substitution model which unlike the basic neoclassical model incorporates workers with different skill levels. It yields the prediction that minimum

wage will lower employment among low-wage workers but may not lower total employment. Zavodny (1998) in his article discusses this model by supposing two types of workers, skilled and unskilled, and the firms can imperfectly substitute among the two. The market-clearing wage for unskilled workers is W_h and the market wage for skilled workers is W_2 . Each firm's profit maximising problem is then

$$\text{Max } n(h, L) = pfQ_i, h) - W_{Ai} - W_2 l_2 \quad \dots(1)$$

Profit maximisation requires that the ratio of the value of the marginal products of the two types of the two types of workers be equal to the ratio of their wages, which can be written as follows

$$\frac{dfduU/ctU}{df(li, l_2) / ol_2} = w, \quad \dots(2)$$

$$\frac{df(li, l_2) / ol_2}{dfduU/ctU} = W_2$$

Equation 2 yields the ratio of skilled to unskilled workers hired at each firm. If the minimum wage above the market clearing wage of unskilled workers but below the wage of skilled workers is imposed, the ratio of marginal product of skilled to unskilled workers would be less than the ratio of their wages. Firms can either reduce the number of unskilled workers leaving the number of skilled workers unchanged or substitute skilled for unskilled workers"(Welch, 1974 "Ripple Effect)⁸. Which outcome occurs depends on the specific form of the production function. If all firms hire more skilled workers, the market wage for skilled workers, W_2 , is likely to rise and such a wage increase will dampen the increase in the number of skilled workers employed. Employment of workers who initially earn less than the minimum wage declines and the employment of higher - paid workers may rise, but the effect on total employment in ^determinate. The total employment effect cannot be positive in this model because the wages of at least one, and possibly both, types of workers increase.

Neo classical models with incomplete coverage

Both the basic neoclassical and the substitution models assume complete coverage of minimum wage. However this is not always the case; the earliest model to include a sector in which workers were not covered by the minimum wage was put forward by Welch (1974). Jones (1997) gives two possible reasons for incomplete coverage; first poor written legislation i.e. not all workers are covered by the legislation. For example, employers have no legal obligation to pay apprentice and casual workers the minimum wage or it is common practice for part time workers, domestic workers, self-employed and children's labour to be excluded from coverage or the case of those outside the wage sector e.g. those engaged in agricultural activities from which no wage is earned but survive from revenue from sales. Secondly, Evasion by firms of minimum wage legislation because the probability of detection is low as enforcement lax due to poor administration and inability by inspectors to carry out adequate inspection of firms and also the cost of compliance is high. This is supported by Rama (1996) who argues that in developing countries the setting & enforcement capabilities are much weaker than those in developed countries (hence higher incidence of non compliance). Freeman (1992) adds a third reason for incomplete coverage; Collusion between employers and employees. He argues that if an extensive unemployment results from minimum wage hikes, minimum wage will not be enforceable because both workers and employers will have an incentive to collude to avoid the law and save jobs.

"Partial coverage gives rise to a dual economy; one covered by the minimum wage

(formal) the other not (normally informal). Bell (1995) talks instead of three

sectors (i) a large urban formal sector where coverage is complete and enforcement is present; (ii) a somewhat smaller urban informal sector in which coverage and enforcement are rare and incomplete and (iii) an uncovered rural sector.

The effect of a minimum wage in this case (incomplete coverage) is two fold; firstly, the introduction of the minimum wage results in a decrease of employment in the covered sector since labour demand in the competitive model is decreasing function of wage. Secondly, workers who loose their jobs in the covered sector will move to work in the uncovered sector, therefore depressing wages in the uncovered sector. As some of the workers have reservation wages above the wage equilibrium in the uncovered sector, total employment is less than employment in the absence of minimum wage. Therefore the final effect on employment very much depends on the size of the minimum wage increase and also on the substitution effects between formal and informal employment.

Fajnzylber (2001) within the context of incomplete coverage slightly varies the model above. According to his modified version, the imposition of a minimum wage would reduce employment in the uncovered sector. This he says is due to three reasons. *First,* the enlarged attractiveness of the formal sector after a minimum wage increase could lead more informal workers and individuals out of the labour force to look for jobs in the formal sector. *Secondly,* employers could choose to respond to a higher minimum wage by substituting away from registered towards unregistered informal workers. *Thirdly,* the case where the minimums wage is used as a numeraire not only in the formal sector but also in the informal sector.

Basic monopsony model

Although a majority of economists believe that the neo-classical model (in all its variations) provides more useful insights into the workings of the labour market, critiques have argued that it represents a theoretical construct with characteristics that simply do not exist in the real world (Waldman, 1997). Moreover, the emergence of theoretical and empirical evidence of neutral and sometimes positive employment effects of the minimum wage could be viewed as evidence in favour of the monopsony model of the labour market or cases where the minimum wage is not binding. Stigler's (1946) monopsonist's model predicts that minimum wages can raise employment over a limited range. A Monopsony firm in this model is a price taker in the product market but has some degree of market power in the labour market. When the firm is confronted with an increase in the minimum wage above the ongoing wage (which is less than the workers marginal productivity in the case of a monopsony), monopsony theory predicts that the best strategy; over a certain range, is to increase the level of employment.

Dynamic monopsony or search models

Includes models by Burdett and Mortensen (1989) and Machin and Manning (1992); where workers have different reservation wages and/or have imperfect information about job opportunities offered by different firms. These models focus on firms' search for workers or workers search for jobs. Firms' ability to hire or retain workers depends their wages and on wages offered by other firms. Firms that offer relatively higher wages attract and keep more workers, and if workers are of varying quality, firms that

offer higher wages have higher quality worker. Thus these models operate like the traditional monopsony model in that firms set wages instead of acting as price takers in the labour market, but they are considerably more complex. Imposing a minimum wage or raising the existing wage floor could result in increased employment.

Wessels theory

Wessels (1997) posits a theory on low wage industry, in particular restaurants with tipped workers, which might operate like a monopsony. If the restaurant hires an additional worker, average tips per worker falls and the restaurant has to make up for the loss in each workers wages. This dynamic creates a gap between the marginal cost of labour and wage, a characteristic of a monopsony. Wessels also shows that the employment in the restaurant industry first rises and then falls as the minimum wage for the tipped workers increase, matching the predictions of the monopsony model.

Efficiency wage models

The model developed by Ageron'-and Aizenman (1999) departs from neo classical theory n assuming that skilled workers are paid an efficiency wage. These authors argue that a reduction in the minimum wage increases the demand for unskilled workers in the formal sector and contributes to a decrease in labour supply in the informal sector; thus leading to an increase in the informal sector wage. Thus as the wage paid to workers in the informal sector rises, the wage paid to the skilled workers is rated up. In turn the :vage increase for skilled workers reduces their employment. However the overall effect on employment is indeterminate.

Response in productivity models

According to Stigler (1946), gives An increase in the minimum wage, if it is effective will do one of the two things: it will either result in the laying off of those workers whose value is less than the minimum or it will result in an increase in productivity among low-efficiency workers. Thus in the presence of productivity effects of minimum wage, negative employment will be reduced or eliminated. Bugarin and Moller (2002) give possible reasons for minimum wages to have productivity effects.

- The higher wage reduces worker turn-over, increasing the level of worker experience and reducing training cost.
- The higher wage attracts more skilled and productive workers to the labour force
- Higher wage employers demand more effort from employees
- Higher wage employees tend to increase work effort to keep their positions
- The firm uses labour saving capital

Economists have explained this model in various ways since the start of the 20th Century. The first to explain w^f s JSidney Webb (1912) whose elaboration came to be known as the "Webb effect". It argues that a wage floor can lead to greater efficiency because workers become more productive. Although an increase in the minimum wage may well result in a wage exceeding the marginal product of the worker, the employer now has an incentive to find ways to increase productivity either by getting his workers to produce more by substituting technology for labour. The worker too has incentive to unprove his or her skills so that the value of his or her labour will justify the new wage. To

get workers to produce more may involve on the job training. Felin (1923) also erved that employers who pay more are in turn forced to take interest in their

employees - to educate them to a level that will make them worth the wage. This view is supported by Freeman (1994) and Lynch (1994) who argue that higher wages, by reducing the level of turnover and therefore encouraging employers to offer on-the-job training, might lead to increased efficiency and productivity. Gordon (1995) also argues that those who are forced to pay higher wages would simply be forced to find ways to improve their productivity. Shapiro and Stiglitz (1984), argue that raising the minimum wage might have the effect of offering positive inducement to work. Workers will work harder and thus be more productive. And employers concerned about shirking will pay less in monitoring costs as higher wage is likely to result in less shirking. Hartley (1992) many firms can legally pay the prescribed wage without reducing employment by adjusting their operations to increase the amount of effort per hour of labour input. Waldman (1997) also argued that a minimum wage would make workers more productive because it would better enable them maintaining physically, which in turn would sustain them spiritually.

Price effect model

Zavodny (1998) argues that the basic competitive model with one or two types of workers assumes that prices do not change when the minimum wage increases and firms reduce employment. However the decline in employment is likely to cause total output to fall, and in turn, the decrease in output will cause prices to rise. This increase will cushion the decline in employment, but is unlikely to completely counteract it.

Kennan (1995) hungry teenager theory

According to this theory, a minimum wage increase is likely to boost the earnings of some workers and these workers may spend their extra income on low wage goods and services, such as fast foods. Such an increase in demand may offset the dis-employment effect of the minimum wage hike (Kennan, 1995). Waldman (1997) advances a similar argument. He explains that insofar as a higher wage will offer low-wage workers more purchasing power, they in turn will be able to demand more goods and services. As they do this, business will produce more, and they in turn will hire more workers, which may have the inevitable results of naturally bidding up wages across the board. Therefore, an increase in the minimum wage, though it may lead to some short-term adverse consequences, will lead to long-term benefits to the whole economy.

Effects on fringe benefits models

Zavodny (1998) in his article explains the fringe benefit theory as follows; firms could attempt to offset an increase in their wage bill due to a minimum wage hike by reducing other labour costs such as fringe benefits and training. If firms can completely offset a minimum wage increase by cutting other costs such as non-wage compensations, they might not reduce employments

Endogeneity models

1 the above models assume that wage floors are imposed or raised, ignoring how minimum wage is determined. However the level of minimum wage may depend on the expected effect on employment. Freeman (1992) argues that on the face of the evidence

that minimum wages rarely distort labour markets seriously may mean that interventions are endogenous to economic conditions, thus sensitive to their costs and benefits, rather than exogenously given, from this perspective minimum wage hikes will not be implemented if expected employment effects are high or will be implemented if negative employment effects are minimal. This would account for negligible employment effects following a minimum wage rise.

2.2. Empirical Literature

As an answer to the ambivalence of the theoretic predictions, a large number of studies using empirical data and different estimation techniques have been developed over the years.

Most empirical works have focused on the overall impact of minimum wage on employment with an enormous amount of them showing a negative association between minimum wage and employment. Given the prevalence and availability of data, it is not surprising that most of these studies relate to industrialized economies especially the United States and Britain. Brown, Gilroy and Kohen (1982), in a survey conducted of the literature, concluded that for a number of years, a large number of economists accepted as a best - guess estimate that, on average, for each 1% increase in minimum wages, employment would decrease by 1/3 %. Gerald (1987) who examines the impact of minimum wage over a period of three years finds that unemployment rates increase by 1.5% as a result of increasing minimum wages by 40%. Currie and Fallick (1993) also found that employed individuals affected by the increase in the minimum wage in 1979 and 1980 were 3% to 4% less likely to be employed a year later. Lustig and

McLeod (1987) also found that increasing minimum wage by 10% would increase unemployment by between 0.5% and 1%. More recent works of Neumark et al. (2000) and Bird and Manning (2003) also found negative employment elasticities with respect to minimum wage. There is also empirical evidence in support of negative employment effects from developing countries. Bell (1995) estimated the impact on manufacturing employment of the erosion of minimum wage in Mexico and its increase in Colombia in the 1980s. She found significant minimum wage effects in Colombia but not in Mexico. In Colombia, an increase of 15% in the real minimum wage is found to have reduced employment by 5% during the 1977-87. In Mexico, the very low value of the minimum wage may very well explain the finding that no dis-employment effect is observed for this country.

Until recently negative employment effects of minimum wage were taken to be the norm, however a number of empirical studies, most notable the controversial findings of Card and Krueger (1995), have found that increasing minimum wage does not necessarily have dis-employment effects, but actually leads to higher level of employment. In studying of the effects of minimum wage legislation in the contiguous states of New Jersey and Pennsylvania at a time when minimum wages increased in the former but not in the latter, Card and Krueger (1995), found evidence of positive employment effects resulting from an increase in minimum wage. The study focused on employment at fast food restaurants, which are typical minimum wage employers in the US. Data from a telephone survey of some 400 of these restaurants indicated an expansion of employment in New Jersey compared to the Pennsylvania control group. An earlier study by Azam (1992) had also found a positive relationship between minimum wage and employment in the case of wheat production in Morocco during (1971 ~ 1989)*

Controlling for the market price of wheat and other cereals, an increase in the real minimum wage in agriculture was found to increase wheat production and therefore the demand for labour. Also a study for the UK by Dickens, Machin and Manning (1994) concluded that elasticity of employment to minimum wage was negligible if not positive.

A number of other studies have focused on the impact of the policy on different segments of the labour market differentiated by skills, age or gender. Neumark and Wascher (1992, 2000, and 2003) found that a 10% increase in the minimum wage reduces teenage employment by 1% to 2% and a decline of 1.5% to 2% among young adults. Currie and Fallick (1996) & Neumark and Wascher (1995b) find that teens who initially earned less than the subsequently imposed minimum wage are less likely to remain in employment a year later than teens who initially earned more than the new minimum wage. Katz and Krueger (1992) suggest that minimum wage increases caused Texas fast food restaurants to substitute full time for part time employees, who may be less skilled. Bird and Manning (2002), in their study of the impact of the policy on employment in Indonesia, found that negative income effects are greatest for the vulnerable groups of workers: female and the young workers.

Most of the empirical works from developing countries in Africa, Asia and Latin America have highlighted the impact of the policy in the context dual economies where coverage minimum wage is not complete. Jones (1997) in a case study of Ghana finds that the Entry's minimum wage policies during the 1970s and 1980s led to a reduction of formal sector jobs and an increase in informal sector jobs. Bird and Manning (2002) study of the impact of minimum wage on employment and earnings in the formal sector of Indonesia, found that minimum wage interventions expanded

informal sector employment while slowing employment growth in the formal sector. Hamidi and Terrell (2001) on a study of the impact of minimum wage policy (1980 - 1992) in Costa Rica, found that employment in the covered sector rose by 0.56%, but no effect on the uncovered sector identified with the self-employed. In Brazil, Fajnzylber (2001) found negative employment effects in both the covered and uncovered sectors, but more on the uncovered sector.

2.3. Overview

At a glance the enormous empirical and theoretical studies seem to suggest that the impact of minimum wage on employment is ambivalent, however a critical analysis reveals that the impact of the policy does not have to be homogeneous as it depends on the structure of the labour market, the level at which the minimum wage is set and the extent of coverage of the legislation. These three will differ not only between countries but also between sectors within the same country. Nevertheless it is evident that negative employment effects are prevalent in these studies thus highlighting the relevance of the neoclassical model in all its variations. Most of the studies both theoretical and empirical in developing countries seem to have relied on the neoclassical model with incomplete coverage. Studies in industrialized countries have focused the impact of the policy on particular segments of the labour market like teenagers and women.

CHAPTER THREE: METHODOLOGY

3.1. Model specification

The study employs the neoclassical theory in specifying the model used to estimate the impact of minimum wage on employment in the Kenyan manufacturing sector. The neoclassical model postulates an inverse relationship between minimum wage and employment. Vandemoortele (1984) however argued that the impact of minimum wage depends on the level at which it is set relative to average wage. The ratio of minimum wage to average wage is therefore a measure of how binding minimum wage is. The higher this ratio is the more binding the minimum wage and thus the stronger its' expected negative impact on employment. Besides minimum wage bindingness, the model also incorporates other variables which macroeconomic theories hypothesize as influencing employment. The model adopted is based on Jones's (1997) model specification.

$$EMPTT_t = F(BIDMW, CGDP, M)$$

Where

EMPTT Annual total number of persons employed in the manufacturing sector

BIDMW = Minimum wage bindingness. It is the ratio of minimum to average wage

CGDP GDP at constant price (Kshs). It captures the effect of economic production on the manufacturing sector employment

IMP Annual level of imports measured using the import quantum indices. It captures the impact of imports on employment.

*^{ue} equation to be estimated is

$$jMEMPTT = p_0 + p_1 LNBIDMW + p_2 LNCGDP + p_3 LNM + e,$$

\Where e_i is the random error term

^he model includes two lags of all the explanatory variables to capture any lagged effects. To normalize the series, a natural log formulation of the equation is adopted and consequently LN is added in front of the variables.

Hypothesised signs and rationale

Variable	Ho Sign	Explanations
LNBIDMW		According to the Neo-classical theory, an increase in minimum wage will cause negative employment effects
T n c g d p	+	In a labour intensive sector, economic growth as measured by increasing GDP will most likely increase employment
LNIMP		Increasing importation of foreign competing substitutes for the local manufactured products will most likely produce negative employment effects

3-2. Estimation of the model

The OLS technique is used to estimate the equation. Diagnostic tests are carried out before actual estimation to ascertain the model specification and explanatory power.

Normality Test

This test is carried out to ensure that variables used in estimation are normally distributed. The Jarque-Bera test statistics test is used to carry out this test. The test involves computing the standard deviations, skewness, probability and kurtosis. Under the null hypothesis of a normal distribution, the Jarque-Bera statistic is distributed as X^2 with 2 degrees of freedom. The reported Probability is the probability that a Jarque-Bera statistic exceeds (in absolute value) the observed value under the null—a small probability value leads to the rejection of the null hypothesis of a normal distribution.

Time series properties

Non-Stationarity of time series data has often been regarded as a problem in empirical analysis. Working with non-stationary variables leads to spurious regression results from which further inference is meaningless. The first step is therefore to test for stationarity of the variables. The conventional Augmented Dickey-Fuller (ADF) tests **and** graphical observation are used to test for stationarity.

If there are non-stationary variables, the next step will be to establish whether they are cointegrated. Differencing of variables to achieve stationarity leads to loss of long-run Properties. A model of only differenced variables gives only a short-run response. The concept of cointegration implies that if there is a long-run relationship between two or more non-stationary variables, deviations from this long-run path are stationary, tables are said to be cointegrated if they are integrated of the same order and if a linear combination of these variables is stationary. To establish this, the Engel-Granger

two step procedure is used. This is done by generating residuals from the long-run equation of the non-stationary variables, which will then be tested for stationarity using the ADF tests. If the residuals will be found to be stationary at 5% level of significance an error correction formulation of the model will be adopted. In addition a correlation matrix for the variables will be explored for comprehensive analysis.

All OLS estimates were achieved with the statistical software package "EViews"

3.3. Data type and source

The study makes use of secondary time series data for the period 1970 to 2001. The main sources of these data include: Government of Kenya Statistical Abstracts and Economic surveys, a publication; Policy Timeline and Time Series Data for Kenya (2002). The data for most variables is annualised except for minimum wage which is given on a monthly basis. This is annualized by multiplying by twelve. Table 1 summaries data relating to the variables¹⁰.

CHAPTER FOUR: FINDINGS AND RESULTS

4.1. Summary statistics

Table 2 shows calculated summary statistics which are used to establish normality of the data

Table 2: Summary statistics

	EMPTT	BIDMW	CGDP	M
Mean	169782.3	0.2812	86,400,000,000	144.5357
Median	176550.0	0.2863	88,500,000,000	126.0000
Maximum	219200.0	0.3457	119,000,000,000	290.0000
Minimum	100683.0	0.2110	48,000,000,000	21.00000
Std. Dev.	37537.45	0.0331	23,000,000,000	59.4091
Skewness	-0.3334	-0.2154	-0.0780	0.4011
Kurtosis	1.9708	2.7509	1.6121	2.8730
Jarque-Bera	1.7543	0.2890	2.2756	0.7697
Probability	0.4160	0.8654	0.3205	0.6806
Observations	28	28	28	28

Source: Own calculations

The median is a robust measure of the centre of the distribution that is less sensitive to outliers than the mean. Hence large deviations of the mean from the median would indicate presence of outliers. Except in the case of imports, variations of the mean from the median are relatively smaller for the other variables. The skewness for a normal distribution is zero. Except for import which is highly positively skewed, constant GDP manufacturing sector employment and minimum wage bindingness have a negative skew implying a long tail to the left. The kurtosis for a normal distribution is 3 in which case minimum wage bindingness and imports are closer to the mark than the other two variables. However on the basis of Jarque-Bera test, we cannot reject the null hypothesis that constant GDP, manufacturing sector employment, imports and minimum wage bindingness are normally distributed.

4.2. Correlation matrix of variables in levels

Table 3: correlation matrix

	LNEMPTT	LNBIDMW	LNCGDP	LNIM
LNEMPTT	1.000000			
LNBIDMW	-0.266647	1.000000		
LNCGDP	0.980636	-0.306468	1.000000	
LNIM	0.225262	-0.442344	0.319732	1.000000

Source: Own calculations

Table 3 shows that there is negative correlation between manufacturing sector employment and minimum wage bindingness. There is high positive correlation between manufacturing sector employment and constant GDP and relatively low positive correlation with imports. These results rule out multicollinearity since correlation between explanatory variables is low.

4.3. Time series characteristics

Table 4: Test for stationarity

Variable	Intercept	Lag	ADF at Level	Critical values 5%	ADF at 1 st Difference	Critical values 5%	Integration level
LNBIDMW	Yes	1	-0.8734	-2.9798	-3.0317	-2.9850	I(i)
LNEMPTT	No	1	-1.0915	-3.5796	-3.9284	-3.5867	I(d)
LNCGDP	No	2	-1.2009	-2.9798	-4.0275	-2.9850	I(d)
LNIM	No	1	-2.5730	-2.9665	-6.1888	-2.9705	I(d)

Source: Own calculations

Table 4 shows that the natural logs of the variables, bindingness of minimum wage, manufacturing sector employment, constant GDP and imports were found to be stationary after differencing them once and therefore integrated of order one I(i).

4'4• Cointegration results

Since the variables are integrated of the same order, we test for cointegration using residuals from the cointegrating equation. Following Mwega & Ndungu (1999), a Long-Run equation was estimated with non-stationary independent variables as regressor.

Table 5: Cointegration equation

	LNEMPTT
Constant	-9.3827 (-12.1014)**
LNCGDP	0.8600 (26.7537)**
LNBIDMW	-0.00064 (-0.0001)
LNM	-0.0465 (-2.4487)**
R-Squared	0.970328
Adjusted R Squared	0.966619
F-Statistic	261.6168**

** indicates that it is significant at 5%

The residuals from the above equation were tested for stationarity. The results revealed that the residuals were stationary at 5% level of significance. Therefore the variables, minimum wage bindingness, imports, constant GDP and manufacturing sector employment are cointegrated and this is a long-run relationship exists between them.

The long-run relationship between changes in minimum wage and employment in the manufacturing sector is negative as hypothesised, however it is not significant. In other words annual increments in the value of the official minimum have no significant long run effects on minimum wage. The long run positive employment impact of growth in national output is consistent with the a priori expectations. Increase in imports results produces negative employment effects in the manufacturing sector. This again is consistent with the a priori expectations.

4-5' Model Re-specification

Having identified a stable long-run relationship between manufacturing sector employment, constant GDP, Minimum wage bindingness and imports, an error correction formulation is adopted with variables in their 1st difference and the ECT which is lagged once since current values is not a valid regressor. (Its inclusion would render the equation singular). The new model is specified below.

$$DLNEMPTT = p_0 + p_1 D LNBIDMW + p_2 DLNCGDP + p_3 DLNM + p_4 ECT_{t-1} + \varepsilon_t$$

D is put in front of the variables to indicate where they have been differenced once

$$\text{Where } ECT = DLNEMPTT - C_0 - C_1 D LNBIDMW - C_2 DLNM - C_3 DLNCGDP$$

ECT is the error correction term. It reflects attempts to correct deviations from the long run equilibrium path and its coefficient can be interpreted as the speed of adjustment or the amount of disequilibrium transmitted each period to economic growth. The C's can be interpreted as parameters of equilibrium relationship about which economic theory is informative (Ndung'u 1993).

4.6. Regression results

The above models with their associated lags were estimated using OLS for time series data.

Table 6: Regression results

	General Model	Reduced Model
	DLNEMPTT	DLNEMPTT
DLNBIDMW	-0.0930 (-1.7295)	-0.0609 (-2.0899)*
DLNBIDMW(-i)	0.02561 (0.4978)	
DLNBIDMW(-2)	0.06653 (1.3988)	0.03158 (1.2436)
DLNCGDP	1.0607 (4.2953)**	0.8701 (7.8250)**
DLNCGDP(-i)	-0.1318 (-0.7630)	
DLNCGDP (-2)	-0.3212 (-2.0601)*	-0.1495 (-2.0444)*
DLNM	-0.0648 (-4.3528)**	-0.0401 (-8.3018)**
DLNM (-1)	-0.0269 (-2.6651)**	
DLNM (-2)	-0.0211 (-2.5155)**	-0.0079 (-1.9376)*
ECT(-i)	-0.1753 (-1.1074)	-0.3297 (-4.2231)***
Constant *	0.0122 (1.6269)	0.0031 (8.3440)**
D7879		0.05918 (0.9777)**
Durbin-Watson Statistic	1.2554	1.9234
R-Squared	0.7309	0.9124
Adjusted R-Squared	0.5387	0.8686
F-Statistic	(3.8031)**	(20.8306)**
Schwarz criterion	-4.4931	-5.8728
S.D. dependent variable	0.0248	0.0248
Standard error of regression		0.0090

Source: Own calculations

general to specific modeling strategy was used to obtain an empirically stable TMsimonious model. The reduction strategy consists of removing the longest lag of each

variable with low t-values and then using the F-test and Schwarz criterion to check validity of the simplification carried out.

Thus starting with a general model 1, the coefficients of the first lags of minimum wage bindingness, constant GDP and imports were omitted since they had very low t values. Also an impulse dummy, D7879, added after critical analysis of residuals to capture the period of the coffee boom 1978-1979. An analysis of residuals showed a shock to the system during that period. Therefore general model was reduced to model 2. The Schwartz criterion decreased for each model from -4.4931 to -5.8728 while the F-Statistic increased from 3.8031 to 20.8306. Hence the simplification seems to be statistically valid.

Before accepting these results two diagnostic tests were carried out. Durbin- Watson statistic is low (less than 2), which would indicate a problem of positive serial correlation; however from the Breusch-Godfrey Serial Correlation LM Test rejects the observed statistic is not significant hence the null hypothesis of presence of first order serial correlation was rejected. * t

Since Autoregressive Conditional Heteroscedasticity (ARCH) affects the DW statistic (low value would indicate ARCH effect), the ARCH effect test was done to test for Heteroscedasticity. From the results of this tests, the observed statistic is not significant I therefore the null hypothesis of presence of autoregressive conditional I heteroscedasticity was rejected.

4-7« Discussion of results

It can be seen that the model explains a large proportion of variations in manufacturing sector employment ($R^2 = 0.87$). It can also be seen from the F-test that the model passes the goodness of fit test at the 1% level of significance. The reliability of the regressor in explaining variations in employment is strengthened by the relatively low standard error of regression of 0.009.

The coefficient for minimum wage is -0.0609 and is significant at 10% level. This means that current changes in the minimum wage impact negatively current changes employment. This is consistent with the postulated hypothesis. The coefficient for the second lag, although reported is not significant. Thus lagged changes in minimum wage do not produce any significant changes in current employment.

The coefficient for National output is 0.87 and is significant at 5% level. This means that current changes in national output have positive impact on current changes in employment. However there is an unexpected change in direction of impact of lagged national output changes over employment. This needs to be studied further.

The coefficient of imports is -0.04 for current changes and -0.0079 lagged changes. Both are significant at 5% level. This means that both current and lagged changes in sports have negative impact on current changes in employment. This is consistent with postulated hypothesis.

The lagged error correction term (ECT t-i) included in the model to capture the long-run dynamics between the cointegrating series has the expected negative sign and is statistically significant at 5%. The coefficient indicates a speed of adjustment of 33% from actual employment in the previous year to equilibrium employment. This is a very low speed of adjustment implying that all errors are not corrected within one year and most of the time the labour market is operating out of equilibrium.

CHAPTER FIVE: CONCLUSION AND POLICY IMPLICATIONS

The overall objective of this paper was to examine the impact of minimum wage on employment in the Kenyan manufacturing sector. Time series data collected from various statistical publications was tested for stationarity before being used to estimate the empirical model. Regression results were only accepted after several diagnostic test were done

The regression results revealed that whereas the negative impact of minimum wage in the short-run is significant, in the long-run changes in minimum wages do not significantly reduce employment in the sector. The results are consistent with other findings Carneiro & Corseuil (2002). As postulated, changes in National output have had a positive impact on employment in the manufacturing sector both in the Long-run and in the short-run. As expected growth in general imports negatively affects employment in the sector both in the short-run and in the long-run.

One of the major objectives of minimum wage since independence has been protecting the low income groups especially those not affected directly by the bargaining process.

One important question is whether minimum wage do indeed protected such group or on the contrary such a policy leads to a loss of jobs for this group of people. With raising employment in the country and the need of maintain international competitiveness of Manufactured sector products via low labour cost it would seem that minimum wage

Policy is more of an obstacle due to the negative employment impact. Clearly there is **t** to ensure that minimum wage changes are not pegged on inflation but on labour Activity. In this regard the decision by the government to base future minimum

Wage Changes on productivity will
unemployment effects of . . .
^ are minimized
earners.

along way in ensuring that the policy's
^ the same time it benefits the low income

»

Foot Notes

¹ In Kenya the legal provision which enables the government to impose a minimum wage is in CAP 229 "The regulation of Wage and Conditions of Employment Act"

² There is considerable disagreement regarding institutional interventions in developing country labour markets. On one side are economists who see unregulated labour markets as neo classical bourses in which government regulation of wages, mandated contributions to social funds, job security, and collective bargaining create "distortions" in otherwise ideal world. These economists view their task as a technical one of measuring the adverse effects of these policies. On the opposite side are institutionally oriented economist who believe that the social aspects of labour markets create large divergences from the competitive ideal as to make that model a poor measuring rod for policy. These analyst stress the potential benefits of interventions, hold that regulated markets adjust better than unregulated markets to shocks, and endorse tripartite consultations and collective bargaining as the best ways to determine labour outcomes. When efficiency conflicts with the social protection of labour, they place greater weight on the latter.

³ Other forms of labour market regulation included

- *Redundancy Laws*, which were aimed at ensuring job security,
- *Wage guidelines* which set the minimum and maximum limits for negotiated wage settlements by taking into account the cost of living among many other factors,
- *Trade Union regulation* in which the Government sought to regulate and restrict trade union activities,
- " *Tripartite agreements* in which the employers pledged to increase employment by a certain percentage if the workers agreed to a wage freeze and abstain from strikes for a specified period (Manda, 2002),
- *Kenyanization of the public service, exclusion of non-citizens from rural trade immediately after independence and use of work permits* to control employment of expatriates.

Whereas minimum wage and wage guidelines regulated the price of labour, the other forms of regulation regulated employment of labour.

⁴ Since early 1970s, it became apparent that the growth strategy (via high incomes) was not going to solve the problem of unemployment. Development strategy paid more attention to distributive aspects of growth. High wage policy was abandoned, and wage policy became an instrument for employment promotion. Low-income policy would not only address the issue of income inequalities, but also encourage more employment opportunjjes through the use of labour intensive technology. (Vandemoortele, 1984)

⁵ After the abolition of virtually all price controls by 1994, it was found necessary to remove restrictions imposed on wage negotiations by wage guideliness. Trade unions from 1994 could seek compensation for price increases without hindrance of wage guidelines. Also, with the implementation of trade reforms in the early 1990s, it became necessary to amend the redundancy laws to allow domestic firms flexibility in labour employment in the face international competition. Through the Finance Act of 1994, the government relaxed the redundancy procedures to make it easier for firms to lay off their workers. Employers from then on could declare workers redundant without having to seek permission of the minister of labour. They were only required to notify the ministry of labour and the trade union movement of the reasons for and the extent of the intended redundancy (Ikiara and Ndungu, 1999)

⁶ In the recent years, the main consideration by the government has been the need to increase employment opportunities through keeping wage rates in line with productivity of the workers and ability of employers to pay the wages. The prominent view by workers and workers organizations is that minimum wages are too low to accord an average worker a bare minimum standard of living as implied in the policy. On the other hand, employers are of the view that minimum wages are high relative to workers productivity. In addition, the government is viewed as having the upper hand in the determination of Minimum wage rates. Also the enforcement of the statutory minimum wage is a problem due to lack of opacity on the part of the government, lack of cooperation from employers and general lack of awareness P* the part of the workers. (Manda, 2002)

7 Most of the literature on the labour markets in the last four decades has concentrated on the effects of education on wages and the returns to education (Bigsten, 1984; Knight and Sabot, 1981; Knight, Sabot and Hovey, 1992; Manda, 2002a; Appleton, Bigsten and Manda, 1999) impact of unionisation on manufacturing sector wages (House and Rempel, 1976b; Manda, Bigsten and Mwabu, 2001), labour market segmentation (Neitzert, 1992), education, productivity and inequality (Knight and Sabot, 1990) and structural adjustment and the labour market (Ikiara and Ndungu, 1997 and Milne and Neitzert, 1994). [Manda, 2002]

8 Assuming that skilled workers are paid higher than unskilled ones, then the substitution model partly formalises Welch (1974) "ripple effect", in which he explained as follows, "If all those who earn less than the minimum are substitutes, then employers will substitute in favour of those workers whose relative costs have increased least and hence (indirect) effect may dominate. This is the presumption underlying the ripple effect, which holds that for workers above a minimum, labour demand increases and the effect declines with the distance from the minimum. For workers who would have been below the minimum converse holds and adverse employment effects with distance from the minimum" (Welch 1974 pg. 292)

9 Zavodny (1998) notes that although this theory is plausible, it is unlikely that low wage employers, have been able to substantially reduce non-wage labour costs because they provide very little in fringe benefit and training.

10 The study will use secondary data collected from various sources. Annual minimum wage was calculated from the monthly general labour minimum wage for Mombasa and Nairobi excluding housing allowance. Mombasa and Nairobi are chosen as most manufacturing firms are based in these two major towns. Annual average wage for the sector is also calculated from the annual average of public and private average wage which are given separately. Annual total employment in the manufacturing sector is also calculated as the sum of private and public sector employment which are given separately. It is tabulated thousands of persons employed annually. Annual inflation is calculated as

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Appendix

Table is Data Set

YEAR	EMPTT	M\V	BIDMYV	CGDP	M	INF	DEF	CPI
1970		1680				0.075	30.43	0.03782
1971		1680			265	0.037	31.89	0.04053
1972	84,738	1680			207	0.054	34.87	0.042
1973	94,437	2220		47379828887	228	0.089	38.15	0.04796
1974	101,333	2112	0.2420	48016487971	242	0.163	44.14	0.05538
1975	100,683	2760	0.2770	55100152595	142	0.178	51.84	0.06481
1976	108,815	3120	0.2941	55044087001	161	0.1	59-95	0.06933
1977	117,965	3720	0.3169	59393950291	151	0.127	71.07	0.08204
1978	130,090	3720	0.3017	55305324188	21	0.126	71.89	0.09169
1979	138,418	3720	0.2858	62082417033	177	0.084	75.98	0.10053
1980	141,300	4848	0.3227	64279788944	190	0.128	82.59	0.11317
1981	146,300	4848	0.2902	69331296091	119	0.126	90.18	0.13685
1982	146,800	5760	0.3106	70308000000	100	0.223	100	0.15744
1983	148,800	5760	0.2868	71229413322	72	0.146	110.56	0.17316
1984	153,100	5760	0.2614	72503438961	91	0.091	122.94	0.19187
1985	158,800	6912	0.2916	75980556776	82	0.108	133.47	0.21213
1986	166,200	6912	0.2699	81022641935	97	0.105	146.22	0.22176
1987	172,900	8160	0.2909	85833022332	105	0.087	153.97	0.23798
1988	180,200	8160	0.2663	91157437120	125	0.123	168.02	0.26447
1989	182,800	8676	0.2585	95433031054	127	0.135	183.84	0.29437
1990	187,700	9972	0.2712	99433650937	108	0.158	198.35	0.34649
1991	188,900	11568	0.2901	100864674787	112	0.196	221.28	0.38996
1992	190,300	13740	0.3104	100057523456	99	0.273	263.2	0.51299
1993	193,600	16992	0.3384	100410894785	114	0.46	326.64	0.78362
1994	197,500	20400	0.3457	103048451155	114	0.288	377.76	0.82568
1995	204,800	22848	0.3057	107595092111	193	0.016	419.78	0.87602
1996	210,500	25128	0.2760	112057878329	219	0.09	458.09	0.95871
1997	214,500	28140	0.2603	114403288207	192	0.112	533-74	1.0432
1998	217,100	32364	0.2509	116240477365	182	0.066	583.4	1.05282
1999	219,200	34632	^ .2312	117741859735	215	0.058	616.25	1.15248
2000	218,700	36708	0.3172	117548075944	207	0.1	662.54	1.26356
2001	216,600	39456	0.2110	118878842838	290	0.058	735.24	1.31694