

Determinants of Wage Inequality in Zambia

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Declaration

I Mukuka Samuel Mulenga declare that this dissertation

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APPROVAL

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Abstract

The global rise in wage income inequality has been an important topic in labour economics over the past few decades. Many studies have been undertaken to ascertain the factors affecting wage inequality. However, little research exists for Zambia on this topic in spite of the importance that is attached to labour matters in successive governments in the country. Thus the study sought to establish the determinants of wage inequality in Zambia. It further wished to document the inequality trend over the past 20 years.

The study employed the data from the Living Conditions Monitoring Survey and Labour Force Survey obtained from the Central Statistical Office to complete this analysis. A quintile regression of wages was used to decompose the observed inequality within the human capital and market segmentation framework, while the Gini coefficients and generalized entropy estimates were used in measuring within group inequality. The study further used the Juhn Murphy Pierce decomposition approach to evaluate the main drivers of wage inequality among the Zambian employees.

It was established that wage inequality has been declining throughout the reference period (1991 – 2011). This could be explained by the increased number of tertiary educated employees in the labour force whose real mean wages were seen to be rising throughout the period. Furthermore, it was discovered that wage inequality is higher among females than it is among men with similar characteristics though there was a declining trend over the review period. Additionally, the study showed that the public-private wage sector premium has been rising, with inequality high and rising among private sector employees.

The study thus established that education exerts the largest influence on wage inequality while gender and the regional location of workers also play a significant (though diminishing) role. The study recommends increased changes in the supply of skills through investments in human capital, to catch up with the rise in demand for skilled labour if wage inequality is to be reduced in Zambia.

To Francis and Chiluba, Tamara and Kayla – I continue to praise God for you

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List of Abbreviations

CSO – Central Statistical Office

ILO – International Labour Organisation

JMP – Juhn-Murphy-Pierce

LCMS – Living Conditions Monitoring Survey

LFS – Labour Force Survey

OECD – Organisation for Economic Co-operation and Development

ZMW – Rebased Zambian Kwacha

1.0 Introduction

According to a number of studies, strong positive global economic performance during the 1990s has achieved modest and consistent real wage gains for workers in most of the Organisation for Economic Co-operation and Development (OECD) countries (World Bank, 2001; Betcheman, 2002). Furthermore, the same studies show that many countries in both Africa and South Asia experienced real wage declines and increasing wage inequality levels during the 1990s. It is argued that rising global wage inequality relates to a change in the wage structure that is demand-driven, emanating from technical changes that have favoured skilled labour in the production process (Kosters, 1998). An analysis of the United States (US) labour market concludes that the skills composition of the workforce improved over time, but that the increase in the supply of skills did not keep pace with rising demand (Ibid).

Some of the trends and patterns found in other countries are also evident in South Africa. McCord and Bhorat (2003), using the October Household Survey (OHS) data in an overview of the South African labour market, show significantly higher levels of wage inequality than in some OECD countries. But, while internationally education and experience are important determinants of earnings differentials, in South Africa factors such as discrimination by race and barriers to mobility (rural/urban, formal/informal) have been associated with larger differentials than the norm (Standing et al, 1996).

In Zambia however, it is yet to be established as to what the picture is like for the labour market dynamics with regards to wage inequality trends. This is largely because the labour statistics are scarcely available and previous research in this area is dated. Furthermore, the literature reviewed shows that there has not been any comprehensive research in Zambia to establish the determinants of the perceived wage inequality. This however does not imply that the Zambian economy has been oblivious to the question of wage inequality all these years. Quite to the contrary, there have been various concerted efforts aimed at redressing the plight of workers particularly those in the lower income brackets through such policies as the minimum wage. The effects of these policies, however, remain undocumented and as such, it is difficult to ascertain whether or not

wage inequality has been redressed. It is for this reason that this study sought to establish the pattern and trend of wage inequality in Zambia over the last 20 years (for which statistics are available) and further outline the determinants of wage inequality.

1.1 Background

The trend toward rising inequality has been a global phenomenon; with differences in degree and timing, wage dispersion has increased throughout the developed and developing worlds (Davis, 1992; Blau and Kahn, 1996; Katz, Loveman and Blanchflower, 1995). In general, rising overall wage dispersion has been concomitant with increases in wage differentials based on observable proxies for skill, such as experience, education and occupation. Literature has established that not only does inequality lead to higher poverty levels at current income levels; it constitutes a barrier to poverty reduction. There are a number of studies (Bourguignon, 2003; Ravallion, 1997, 2004; Lopez and Serven 2006a; Perry et al, 2006) that show that the growth elasticity of poverty reduction is lower (in absolute value) in countries with high levels of income inequality. In other words, countries with higher inequality levels require a faster growth rate to achieve the same poverty reduction than countries with low inequality.

According to the CSO (2013: 3) the majority of Zambians have continued to live in poverty notwithstanding the country recording high positive growth rates in excess of 5% over the past 7 years. Results from the 2006 and 2010 Living Conditions Monitoring Surveys (LCMS) show that poverty levels have remained high despite recording a decline from 62.8% to 60.5%.

What has compounded this problem is the fact that the majority of Zambians have not had decent and well-paying jobs over this period. The current government soared to victory in the 2011 elections mainly due to their ability to convince the young population of better employment prospects once elected into power. Indeed the current government is the first to document a policy direction on job creation. The Zambian government has further sought to redress the plight of many workers who seem to have been receiving low wages. To this effect, the government has implemented specific policies effecting

minimum wage provision for domestic and general workers in different industries in the country.

Nonetheless, the gap between the lowest paid workers and the highest paid workers in the country has remained significantly high. According to the 2012 Zambia Labour Force Survey, workers in managerial occupations had the highest average monthly earnings at ZMW 10, 524.134 while the national average monthly income was estimated at ZMW 1, 724.106 and workers in elementary occupations had average monthly earnings at ZMW 977.023. Furthermore, it was reported that only 10.1 percent of the labour force earned incomes in excess of ZMW 3,100.

According to the Decent Work Country Profile (2012) the share of paid workers with monthly earnings below two-thirds of median monthly earnings (low pay rate) excluding agriculture, generally remained more or less constant between 2005 and 2008, at 35 per cent. In urban areas, the low pay rate was lower (33 per cent) than in rural areas (41 per cent); it went up in urban areas while it declined significantly in rural areas between 2005 and 2008.

The factors behind -the observed wage inequality, however, remain at best speculative in Zambia and thus the study sought to establish these factors and further trace the trend in this phenomenon over the past 20 years.

1.2 Statement of the Problem

Inequality has important implications for social cohesion (i.e. whether we as a society feel more as one nation with common interests). Social cohesion is important because a more united nation would be able to have internal peace and its citizens would lead happier lives. According to Galbraith (1998) when citizens have diverging access to services (due to income and social inequality) the result can be social and political fracturing. Inequality may endanger society's ability to think of itself as a single entity or nation and hence promote individualism which may work to increase vice and strife in the economy.

Thus establishing an equitable environment in which different workers with similar characteristics doing equal work earn an equal income is essential to the promotion of stability. Furthermore, reducing the gap between the high income earners and the low income earners should remain a prudential motive of any well-meaning political and social structure that ensures sustained and equitable economic growth. A rational policy response to the observed changes in the real level and structure of earnings must, of course, be based on a diagnosis of the causes of the changes, and “the causes of rising inequality” question has spurred a great deal of research by economists world over. However, such a diagnosis is yet to be done for Zambia and indeed whether wage inequality has been falling or rising in the country is a conclusion that is yet to be reached. It is for this purpose that this study has been undertaken to provide insight into the existence of this phenomenon.

1.3 General Objective

To establish the determinants of wage inequality in Zambia and further determine the wage inequality trend between 1991 and 2012.

1.4 Specific objectives

- To establish the wage inequality trends in Zambia over the reference period
- To assess the effect of gender on wage inequality in the Zambian labour force over the reference period
- To determine the impact of education on wage inequality in the Zambian labour force
- To establish the wage differential trend between the public and private sector employees over the reference period in Zambia

1.5 Hypothesis

- Wage inequality in Zambia has been rising between 1991 and 2012

- The gender wage gap has declined over the period 1991 to 2012 in the Zambian labour force
- Improvements in education work to reduce wage inequality in Zambia
- The public – private wage differential has widened between 1991 and 2012 in Zambia

1.6 Significance of the Study

According to ILO (2012: 15) in general the level of wages in Zambia are insufficient to provide the basic living wage as is shown by the working poverty rate which refers to the proportion of employed persons who live in households below the poverty line. The working poverty rate indicates that the majority of Zambian workers in regular employment remain in relative poverty due to low levels of pay. The working poverty rate, which declined from 73.15 per cent in 1998, was still high in 2006 at 66.39 per cent. Employment together with critical conditions of employment such as the real wage and social protection for the vulnerable therefore remains the most sustainable route out of poverty, as the ILO strongly contends, and Zambia's policy to alleviate poverty must focus on this.

It is therefore incumbent that an understanding of the determinants of wage inequality in Zambia be established. This would help in the policy formulation process aimed at mitigating the adverse effects of wage inequality and ultimately poverty reduction. Implementing policies without an understanding of the factors underlying the existing problems is tantamount to redressing symptoms and not the disease. Thus this paper provided an opportunity for the Zambian labour market to have an understanding of the determinants of wage inequality from the country's perspective. Furthermore, the findings of this paper are useful to government planners and policy makers, in that they provide and thus create awareness on whether or not minimum wage laws should be seen as a panacea for the country's wage inequality problems.

Additionally, this paper provides ground breaking research in Labour economics with regards to the study of wage inequality as such a study is yet to be done in Zambia. Thus

the findings of this research provide an impetus for further research in the field while further contributing to the body of knowledge in the literature.

2.0 Literature Review

In order to have a better understanding of the topic and to appreciate the work done by previous scholars, a review of the literature is imperative. This is useful particularly for model specification and the development of the study methodology. The section thus presents a theoretical review and later an empirical review of the phenomenon of wage inequality. A theoretical framework is then adopted from the theories discussed to provide a premise for the ensuing analysis.

2.1 Theoretical review

Segmented Labour Market Theory

The theory of labour market segmentation contrasts with the view of neo-classical economic theory, which posits the existence of a unified market for labour, consisting of buyers and sellers in open competition with each other. The labour market is seen as functioning in the same way as other markets. In this model, the only difference between different workers' wages and conditions arise from individual differences in their human capital (skills, experience, or formal education) or tastes. Thus observed differences in compensation for labour arise only on the supply side.

Reich (1973) defines labour market segmentation as the historical process whereby political economic forces encourage the division of the labour market into separate submarkets, or segments, distinguished by different labour market characteristics and behavioural rules. Segmented labour markets are thus the outcome of a segmentation process. Segments may cut horizontally across the occupational hierarchy as well as vertically. Reich (1973: 359) argues that the present labour market conditions can most usefully be understood as the outcome of four segmentation processes.

1. Segmentation into Primary and Secondary Markets

The primary and secondary segments, to use the dual labour market theory are differentiated mainly by stability characteristics. Primary jobs require and develop stable working habits; skills are often acquired on the job; wages are relatively high; and job

ladders exist. Secondary jobs do not require and often discourage stable working habits; wages are low; turnover is high; and job ladders are few. Secondary jobs are mainly (though not exclusively) filled by minority workers, women and youth.

2. *Segmentation Within the Primary Sector*

Within the primary sector, segmentation is observed between "subordinate" and "independent" primary jobs. Subordinate primary jobs are routinized and encourage personality characteristics of dependability, discipline, responsiveness to rules and authority, and acceptance of a firm's goals. Both factory and office jobs are present in this segment. In contrast, independent primary jobs encourage and require creative, problem solving, and self-initiating characteristics and often have professional standards for work. Voluntary turnover is high and individual motivation and achievements are highly rewarded.

3. *Segmentation by Race*

While minority workers are present in secondary, subordinate primary and independent Primary segments often face distinct segments within those submarkets. Certain jobs are "race-typed," segregated by prejudice and by labour market institutions. Geographic separation plays an important role in maintaining divisions between race segments.

4. *Segmentation by Sex*

Certain jobs have generally been restricted to men; others to women. Wages in the female segment are usually lower than in comparable male jobs; female jobs often require and encourage a "serving mentality-an orientation toward providing services to other people and particularly to men. These characteristics are encouraged by family and schooling institutions.

Jakstiene (2010: 628) notes that modern labour market segmentation theory arose in the early 1960s. It opened the eyes of many economists viewing the labour market as just a market with people with individual characteristics of education and motivation as well as technology playing a major factor in terms of producing output. This view has since helped economists to look at the demand-side of the market, the nature and strategy of the employers. The idea of non-competing groups has been developed in theories that are identified under the general label of labour-market segmentation theory.

In the theory of labour market segmentation, there exists important differences on the demand side which imply differences in compensation and the like that are not explained by individual workers' characteristics. Since labour markets are far from perfect, non-market institutions such as craft unions and professional associations play a role, as do the different strategies employed by employers, in producing different results for workers with similar characteristics. Typically, labour market segmentation splits the aggregate labour market between the primary sector and the secondary sector as described above.

This model of the labour market segmentation has been developed over the years to accommodate the fact that different job professionals work in completely different job markets. For example, Lawyers and fashion designers work in different markets. Some of the major dividing-lines that have been identified are occupational, geographical, and industrial. Occupational labour-markets arise from the division of labour, increasing differentiation and specialization. These workers are unable to switch between occupations because they require different skills and extensive investment in training and qualifications. For example, nurses and doctors form separate occupational labour-markets even though they work side by side in the same organizations. For example, specifying the minimum qualifications and experience requirements restricts the entry into an occupation even if they work side by side in an organization (Ibid).

Geographical labour-markets are also defined considering that neither employers nor workers can move to another location without acquiring considerable amount of costs. As a result wages can remain higher in big cities as opposed to smaller cities. Thus there would be a vast number of unemployed people in certain parts of the world as opposed to others primarily because of the demographics. The workers also differ in their tastes and preferences for leisure time rather than work and for financial reasons rather than rewards. Their investment is their education, training, work skills, and experience. But it still makes sense to analyse labour supply and demand in the aggregate.

The primary sector and secondary sector, both these sectors possess different wages and each employment characteristics are different. The two markets are connected, with movement between them at specified ports of entry and exit. The jobs in the primary

internal segment are those typical of the hard core of stable employees in a firm, need long on-the-job training in firm-specific skills, have security and good promotion prospects, a high span of discretion, and high material rewards. Professional and skilled craft work requiring occupation-specific rather than firm-specific skills, and often supplied on a contract or self-employed basis.

The secondary external segment provides jobs that are low skilled, offer little autonomy and responsibility, low and unstable earnings, and poor working conditions, including casual and seasonal work. The secondary internal sector offers jobs that are generally low grade but with some on-the-job training, security, and promotion prospects. The concepts of primary and secondary labour-markets have now passed into conventional thought, with the primary labour-market commonly understood to mean people with secure jobs and good conditions of work in public-sector employment, the large corporations and highly unionized industries; while the secondary labour-market is understood to cover small employers, non-unionized sectors of the economy, competitive industries such as retailing, where jobs are less secure and conditions of work and pay are generally the poorest.

New theoretical developments include the concept of International Segmentation of Labour, which considers the different circumstances of the labour process in the global south and north. When labour from the south migrates to the north, this international labour segmentation tends to remain intact within the destination country (Bauder 2006). The concept of "Globally Segmented Labour Markets" by John Asimakopoulou argues within a Marxist political economy framework using Social Structures of Accumulation theory, developed by American economist David Gordon, that neoliberal globalization has expanded labour market segmentation internationally. Accordingly, there are two global regions. The first is in the West where affluent citizens consume global products and services. The second is in the poor global regions e.g. China where poorly paid workers produce the global products and services. Asimakopoulou argues this is a natural evolution of Capitalism's pursuit of profits through surplus labour.

Reich (1975) argues that Labour market segmentation arose and is perpetuated because it is functional that is, it facilitates the operation of capitalist institutions. Segmentation is functional primarily because it helps reproduce capitalist hegemony as follows:

- First, as the historical analysis makes quite clear, segmentation divides workers and forestalls potential movements uniting all workers against employers;
- Second, segmentation establishes "fire trails" across vertical job ladders and, to the extent that workers perceive separate segments with different criteria for access, workers limit their own aspirations for mobility. Less pressure is then placed on other social institutions the schools and the family, for example that reproduce the class structure;
- Third, division of workers into segments legitimizes inequalities in authority and control between superiors and subordinates. For example, institutional sexism and racism reinforce the industrial authority of white male foremen.

A critique of the labour market segmentation theory

In much of the segmentation literature, the focus is fairly narrow, with researchers exploring whether there are earnings differentials between the formal and informal sectors. In some research the distinction between the formal and informal sectors is based on the ILO definition of informality, as defined in Hussmans (2004), that is whether the individual is registered or the firm the individual works for is registered (Badaoui et al. 2008). In other research informality is defined as whether the individual receives benefits from their employer (Pratap and Quintin 2006) or has the correct registration card required in Brazil (Botelho and Ponczek 2011). However it is precisely defined, a binary dichotomy between the formal and informal sectors is helpful in exploring how the regulatory environment affects the earnings of those in the formal sector, but does little to enlighten our understanding of how other labour market institutions affect earnings in both the formal and informal sectors.

This definition does not capture what role the trade unions play or how large the public sector earnings are relative to the private sector. Furthermore, if there are multiple segments within the informal sector (Fields 2005), can they be described or not and how

do own account work compare to wage employment in small firms. These questions seem to have fallen by the wayside in the debates over whether the labour market is segmented.

The literature further argues that formality is not simply a dichotomy between the formal and informal sectors. Chen (2006) has argued that there is actually a continuum of the formality of jobs, with some being more formal than others. In this vein Gunther and Launov (2012) argue that there is heterogeneity within the informal sector in Ivory Coast, and that the data they use suggests there are two distinct segments within informal employment, each of which pays less than the formal sector. Falco et al. (2011) also argue against a binary dichotomy, suggesting that enterprise size is a key determinant of formality in both Ghana and Tanzania. In different ways the papers reviewed above suggest that the labour market is more complex than a description of a simple dichotomy between the formal and informal sectors.

This paper adopts this approach in spirit. Partly this is driven by data considerations, since the data we use does not enable us to classify individuals as working for a registered enterprise along the lines of the most recent ILO definition of informality (Hussmans 2004). Emphasis is however placed on the important distinctions within the formal sector, as well as comparing earnings between jobs that are more and less formal. Unionized, public sector work in Zambia is regarded as highly formalized, unionized regular work in the private sector less so and self-employment or casual employment even less formal. The segmented labour market hypothesis suggests that jobs with higher levels of formality would be higher paying than less formal jobs, even after controlling for observed and unobserved ability. The study tests this hypothesis as a possible explanation for the observed inequality in the Zambian labour force.

The Human Capital Model

The human capital model links expected lifetime labour force participation to one's incentive to acquire marketable training. In turn, this training, acquired in school and on the job, determines earnings potential. Thus expected lifetime work history is the most important motivating ingredient in one's ability to eventually achieve high earnings (Polacheck, 2004).

The process works as follows: There are costs and benefits to human capital acquisition. The costs are direct (such as tuition and learning manuals) and indirect (mostly foregone wages during training). The benefits are mostly increased lifetime earnings. However, there are some other more intangible benefits like how one conducts him/herself in everyday life, as well as social benefits such as reduced crime, lower unemployment, and greater economic growth. The more years one works the greater the opportunity to reap the benefits of higher earnings. So, for example, if one was never to work, marketable human capital benefits would be zero, independent of how many professional or Ph.D. degrees one acquires. In a similar vein, dropping out of the labour force to bear and raise children reduces lifetime work years, which in turn decreases the potential rewards from human capital. These reward reductions decrease the value of human capital investment. In contrast, those who expect to work long hours, and those who foresee the greatest number of years at work have the highest expected returns.

Thus, all else constant, the less one's lifetime labour force participation, the lower the benefits to investment, and hence the smaller one's incentives to invest in training.

The human capital model has been applied in studies explaining the wage differential between men and women. Since, on average, women work fewer hours throughout their lives, one expects women to purchase less human capital investments than men. Lower human capital investments relative to men: translate to lower per hour relative to women's wages. Hence the male female wage gap widens. On the other hand, as women's lifetime labour force participation rises, and as men's lifetime labour force participation falls, one should expect the male-female wage gap to narrow.

Additionally, a worker with anticipated intermittent labour force participation follows a lifecycle-training pattern different than the typical worker. Rather than begin with large, but diminishing amounts of training, investments are initially small. They then rise moderately until the time one permanently reenters the workforce, when child rearing is completed. As a result, women's earnings need not exhibit the usual concave age earnings profiles characteristic of men, given these human capital investment patterns.

For this reason, women's lifecycle earnings profiles are flatter than men's. Further, women's earnings are often non-monotonic (i.e., exhibit a midlife dip), depending on the pattern of intermittent work behaviour. Although rarely emphasized in the literature, these patterns strongly emerge in empirical studies (Polachek, 1975).

Furthermore, as one gets older, earnings rise each year. The rate at which earnings increase from year to year varies with one's age. Young workers, below 35, experience the most rapid per year earnings increases. Workers in their 50s find earnings growth to be relatively meagre. Their earnings rise hardly at all.

Once again, the human capital model explains why earnings growth varies over the lifecycle. Early in life (below age 35), individuals have a whole work-life ahead. With so many years to work, investments in training payoff big-time, since returns are reaped for a long time. Later in life, the "present value" of training is smaller since there are fewer work years to accumulate the returns. Accordingly, older individuals typically purchase less training, and concomitantly earnings rise less quickly.

In conclusion, it can be noted that the human capital theory provides a cogent elucidation of how training influences earnings. The more education and on-the-job training one obtains (i.e., the more human capital one gets), the more one earns. But as earlier shown incentives for acquiring human capital depend on how much one expects to work.

2.3 Theoretical Framework

The study adopts both the segmented labour market theory and the Human Capital model to explain the existence of wage inequality in Zambia. This is because both of these approaches have strong explanatory significance in the Zambian context. It is undeniable that wages in the informal sector are lower than those in the formal sector. However, the distinction between these two sectors can sometimes be overshadowed and the segmentation tends to be broader than the definition encapsulates. Conversely, the human capital model shows that the wage inequality can be ascribed to the differences in the levels of investment in the human capital as observed by such indicators as educational attainment, experience and workers age to mention but a few.

However, it is difficult from the onset to tell which of the two approaches is relevant to the Zambian labour market. As such, the study will test both of these approaches and verify which is more relevant to the Zambian situation.

2.4 Empirical Review

Using data from the March Current Population Survey (1964 – 1990), Chinhui, Murphy and Pierce (1993) document an increase over the past 30 years in wage inequality for males. Between 1963 and 1989, real average weekly wages for the least skilled workers (as measured by the tenth percentile of the wage distribution) declined by about 5 percent, whereas wages for the most skilled workers (as measured by the ninetieth percentile of the wage distribution) rose by about 40 percent. They find that the trend toward increased wage inequality is apparent within narrowly defined education and labour market experience groups. Their interpretation is that much of the increase in wage inequality for males over the last 20 years is due to increased returns to the components of skill other than years of schooling and years of labour market experience. Their primary explanation for the general rise in returns to skill is that the demand for skill rose in the United States over this period.

Causes of wage inequality

According to Topel (1997) increases in inequality are driven by a steady increase in the relative demand for skilled labour, which has outrun the increasing supply of such labour. Topel (1997) notes that the growth of wage inequality has been accompanied by growth in the returns to various measures of skill, such as education and experience, and hence feels that it is natural to think of changing inequality in a supply and demand framework. Thus he outlines the factors that influence wage inequality into supply and demand factors.

On the supply side, factors that change the skill composition of the labour force include immigration, changes in the size of birth cohorts, education and increased labour force participation by women. Measurable factors affecting labour demand which excludes technical change are changes in product demands and reductions in trade barriers.

Education

In many countries, younger cohorts of workers are more educated than are their parents. Entry of these workers into the labour market reduces the returns to schooling because educated workers become relatively abundant. This reduction in the returns to skill will reduce wage inequality. Considerable interest has focused on relative numbers of workers with different levels of educational attainment. There are two reasons for this interest. First, education is the most easily quantified empirical measure of skill. However, it should be remembered that education is only one of many dimensions of skill or talent that are valued in the labour market, so changes in the returns to schooling explain only a portion of observed changes in wage inequality. Second, education is commonly viewed as being central to any long-run solution to rising inequality. If skill differences in wages are too narrow in the future, perhaps the only plausible approach is to increase the share of skilled workers in the labour force through education, on-the job training and other forms of human capital investment.

In recent decades, most industrialized countries have experienced a rapid up- grading of the educational composition of their labour forces, as expansion of public education causes younger cohorts to enter the labour market with more schooling than their predecessors. Absent offsetting shifts in demand, changes in educational composition should reduce the returns to schooling and, perhaps, overall wage inequality.

Much empirical evidence suggesting a strong association between education and inequality has emerged since the seminal work of Mincer (1958). However, some of the evidence is contradictory. For example, Chiswick (1974) found that higher levels of schooling increase inequality. In contrast, Ahluwalia (1976) found a negative association between school enrolment and inequality. However, Ahluwalia's results vary according to the measures employed. Secondary schooling is positively related to the shares of the middle 40 percent and the lower income group, while an increase in the literacy rate is negatively associated with the income share of all income groups except the lowest 20 percent quintile. Winegarden (1979) also reports similar findings; education increases the income share of the bottom quintile income. More recent studies by Sylwester (2003) and

Georgio (2003) find a negative relationship between higher education enrolment and inequality. However, they also find that education has less impact on inequality in African countries compared to other regions.

Inequality and Female Labour Force Participation

In many developed economies, female labour force participation has soared during the past 25 years. At the same time, male wage inequality has increased. The median of the female wage distribution falls at about the 25th percentile of the male distribution, which suggests that women may compete in the labour market with relatively low-wage men. Further, most of the increase in female labour supply occurs because participation is high among younger cohorts, who have fewer years of labour market experience (Blau and Khan, 2000). But while it is tempting to look for causation running from this increase in female labour supply to declining wages of less-skilled men, a connection isn't easy to find. For the facts to fit together, it must be the case that these low-experienced, highly educated women who have entered the labour market are good substitutes for low-skilled men, whose wages fell.

Changes in Product Demands as a Source of Rising Inequality

Increases in demand for products that employ more high-skilled workers, or decline in demand for products that employ low-skilled workers, will tend to increase inequality. However, empirical research has found little evidence that changes in the industry composition of demand have had an important effect on relative wages (Topel, 1997). While demand changes go in the "right" direction, favouring skill-intensive industries, they are small and swamped by changes in the supply of different skill groups. For example, in studying regional differences in wage inequality, Topel (1993) found that the decline of certain industries, like durable goods in the Midwest or trade-sensitive industries generally, had minor effects on wage inequality. Similar results were found in aggregate data by Murphy and Welch (1993) and Katz and Murphy (1992) and in Korean data by Kim and Topel (1995). At least in terms of measurable quantities-which leave out technology, of course-by far the largest part of the story seems to be on the supply (factor proportions) side.

Wage inequality has risen in modern economies because rising demands for skills have made talented people scarcer. As in other market situations, this "problem" of a demand-driven rise in price contains the seed of its own solution. Supply is more elastic in the long run than in the short run. Rising returns to skill encourage people to invest in human capital, which in the long run will increase the proportion of skilled workers in the labour force.

Topel (1997:10) considers the market for schooling, the dimension of human capital investment that is directly observable. Given the unprecedented increase in the returns to education between the periods 1965 – 1990, the public policy debate on whether greater investments in education are socially and privately worthwhile should be over. However, Berliner and Biddle (1995, pp. 100-102) conclude that fewer young people should go on to college.

By increasing the supply of less-skilled workers, even while the demand for them has been falling, this advice is an ingenious recipe for reducing their wages and making wage inequality greater than it already is.

This evidence demonstrates that rising demand for educated workers generates a corresponding increase in quantity supplied, which in the long run will attenuate the growth in the returns to schooling. Furthermore, there is no reason to believe that this behaviour is confined to investments in higher education. It will occur in other realms, such as on-the job training, where the price of skills has risen. Rising stocks of skilled workers in the future, generated by current and future human capital investment, will limit the growth of inequality. This does not imply that inequality will fall in the future; only that skill accumulation will limit its growth. There is no evidence yet that the growth in the supply of skilled workers has kept pace with rising demand.

Change in occupation and industry composition

The change in occupation and industry composition has been hypothesized to have had an effect on the wage structure quite separate from that described here. Some authors (Bluestone and Harrison 1988) and the popular press have emphasized the shift in

industrial composition toward services and away from manufacturing as a shift toward low-wage jobs and a shift toward industries in which high- skilled or highly educated workers do well but less educated and less skilled workers do poorly. This alternative theory suggests that in fact wage inequality has risen as a result of a shift in employment toward low-wage jobs or a shift in employment toward both high- and low- wage jobs. The demand index numbers clearly reject the hypothesis that employment has shifted toward low-wage jobs but support the view of a shift toward high-wage jobs (Chinhui, Murphy & Pierce, 1993).

Other potential causes of inequality

There are three main candidates to explain rising inequality: shifts in relative labour demand, shifts in relative labour supply, and changes in labour market institutions. Within the set of demand-side and institutional explanations, those that have received the most attention are international trade, technological change, the composition of aggregate demand, the decline in the real minimum wage, and de-unionization. On the supply side, changes in the supply of educated workers have been emphasized as an importance influence. Presumably some combination of all of these has contributed to increased wage dispersion.

One broad point of consensus is that a primary cause of rising inequality has been a shift in relative labour demand toward more skilled workers. Katz and Murphy document that for the U.S. economy overall, supply changes alone cannot explain rising income inequality. The main reason is that for most time periods and skill groups, both the relative earnings and relative supply of more skilled workers have been rising. Relative earnings can increase along with relative supply only if relative demand is increasing as well. Katz and Murphy conclude that demand growth has been an important component of the change in factor prices since 1963 and particularly during the 1980s. Autor, Katz, and Krueger (1997) also report an acceleration of the demand shift between the 1970s and 1980s relative to earlier decades. Looking at just the manufacturing sector, Eli Berman, John Bound, and Zvi Griliches and Robert Z. Lawrence and Matthew J. Slaughter (1994) find the same trend: that even though the relative wage of more skilled

workers has been rising, within most industries firms have been employing relatively more of these workers. These facts point strongly toward a shift in labour demand.

The influence of international trade on labour demand

Both trade and labour economists have studied whether international trade has contributed to the demand shift away from less skilled workers. To date, the majority of trade economists working in this area have tested trade's role in a Heckscher-Ohlin framework. The standard assumptions are that all countries make the same sufficiently diversified mix of products under perfect competition and with all factors (in particular, skilled and unskilled labour) perfectly mobile across industries. In this context the Stolper-Samuelson theorem predicts that international trade influences relative factor demands and thus factor prices. The basic idea underlying all versions of the Stolper-Samuelson theorem is straightforward. International trade affects the prices of products, which, in turn, affect factor prices by changing relative factor demands.

Any trade-induced change in a country's product prices alters the relative profit opportunities facing its price-taking firms, which respond by shifting their resources toward (away from) those industries in which relative profitability has risen (fallen). This entails a shift in country-wide demand for factors of production: Demand rises (falls) for the factors used relatively intensively in the now relatively profitable (unprofitable) sectors. Given fixed factor supplies, changed factor demands mean changed factor prices. Thus trade influences relative factor prices via changes in the terms of trade—which may result from trade liberalization and other causes.

Given these concerns, various authors have searched for effects of trade in output or employment quantities. Bound and Johnson (1992) treat trade as a product-demand shock and find that it explains very little of the rise in inequality. Berman, Bound, and Griliches (1994) assume that trade operates by shifting demand across industries only (which could be true, for example, with fixed-input production technologies and an unchanging set of industries produced). Yet they conclude that the large majority of the manufacturing-wide demand shift occurred within industries. From this they conclude that trade played no important role.

The role of labour market institutions

In addition to supply and demand, a possible influence on relative wages is labour market institutions interacting with supply and demand. The two most important ones are unions and minimum wages. And the broad evidence here is that both have mattered: In the two OECD countries with the strongest rise in inequality during the 1980s (the United States and the United Kingdom), both of these institutions weakened in ways that tended to exacerbate inequality.

The decline in trade unions might be an important explanation of rising inequality. Unions reduce inequality by standardizing pay rates among workers within an establishment and across establishments. The threat of unionization also forces non-union employers to raise pay or benefits to keep unions out. Thus, strong unions generally mean less inequality.

Minimum wages obviously tend to reduce inequality, at least among the employed. The fall in the real minimum wage also seems to have contributed to rising inequality in the United States and United Kingdom ((Blanchflower and Slaughter, 1997).

Overall, then, the timing of changes in these institutions and wage inequality suggests a link between them. More systematic research has supported this view. Freeman (1996) argues that one-fifth of the total rise in inequality can be attributed to declining union power. Blau and Kahn (2000) argue that more decentralized wage-setting mechanisms in the United States account for the greater rise in male wage inequality in the United States than in other countries. Fortin and Lemieux (1996) (and, relatedly, John E. DiNardo, Fortin, and Lemieux(1996)) argue that one-third of the total rise in U.S. wage inequality in the 1980s can be attributed to declines in unionization and the real minimum wage along with economic deregulation.

Gender and occupational segregation

Traditionally, economic analyses of the gender pay gap and occupational segregation have focused on what might be termed gender-specific factors-that is, gender differences in either qualifications or labour market treatment of similarly qualified individuals. More

recently, following on the work of Juhn, Murphy and Pierce (1991) on trends in race differentials, some advances have been made by considering the gender pay gap and other demographic pay differentials in the context of the overall structure of wages. Wage structure is the array of prices determined for labour market skills and the rewards to employment in particular sectors.

Gender differences in qualifications have primarily been analysed within the human capital model (Mincer and Polachek, 1974). Given the traditional division of labour by gender in the family, women tend to accumulate less labour market experience than men. Further, because women anticipate shorter and more dis-continuous work lives, they have lower incentives to invest in market-oriented formal education and on-the job training, and their resulting smaller human capital investments will lower their earnings relative to those of men. The longer hours that women spend on housework may also decrease the effort they put into their market jobs compared to men, controlling for hours worked, and hence also reduce their productivity and wages (Becker, 1985).

To the extent that women choose occupations for which on-the-job training is less important, gender differences in occupations would also be expected. Women may especially avoid jobs requiring large investments in specific skills which are unique to a particular enterprise, because the returns to such investments are reaped only as long as one remains with that employer. At the same time, employers may be reluctant to hire women for such jobs because the firm bears some of the costs of such firm-specific training and fears not getting a full return on that investment (Ibid).

Labour market discrimination may also affect women's wages and occupations. Discrimination can arise in a variety of ways. In Becker's (1957) model, discrimination is due to the discriminatory tastes of employers, co-workers, or customers. Alternatively, in models of "statistical discrimination," differences in the treatment of men and women arise from average differences between the two groups in the expected value of productivity (or in the reliability with which productivity may be predicted), which lead employers to discriminate on the basis of that average (for example, Aigner and Cain, 1977). Finally, discriminatory exclusion of women from "male" jobs can result in an

excess supply of labour in "female" occupations, depressing wages there for otherwise equally productive workers, as in Bergmann's (1974) "overcrowding" model.

Wage structure is a factor not directly related to gender which may nonetheless influence the size of the gender gap in pay. Although it has only been recognized recently, the human capital model and models of discrimination potentially imply an important role for wage structure in explaining the gender gap. If, as the human capital model suggests, women have less experience than men, on average, the higher the return to experience received by workers, regardless of sex, the larger will be the gender gap in pay. Similarly, if women tend to work in different occupations and industries than men, perhaps due to discrimination or other factors, the higher the premium received by workers, both male and female, for working in the male sector, the larger will be the gender pay gap.

Wage inequality in the developing World

One explanation for the large sectorial earnings differentials in South Africa posits the existence of institutional features of the labour market which prevent earnings in the formal sector from equalizing the demand and supply of labour in this sector, and which generate sectorial wage differentials for otherwise identical workers, often described as segmentation. In the developing country context the Fields (1975) extension of the Harris and Todaro (1970) model of migration has been the basis for much of the empirical literature seeking to explore whether segmentation exists in the labour market. This model included an urban, informal, free-entry sector, along with the urban formal sector and rural agriculture, where the existence of a minimum wage or union activity in the formal sector created wage differentials between the formal and informal sectors and left those in the informal sector worse off than those in the formal sector.

An alternative explanation for earnings differentials is the traditional neoclassical framework, which emphasizes the productivity of individuals as the primary driver of wages in a competitive labour market. In this explanation of labour market outcomes earnings differentials across different types of employment simply reflect average differences in individual human capital and ability in these different types of employment (Heckman and Sedlacek (1985), Heckman and Hotz (1986), Maloney (2004)). These

explanations are inspired by the Roy (1951) model of the labour market, in which individuals' comparative advantages in either of the two sectors determines their choice of where to work and their earnings.

The emphasis on individual heterogeneity driving both earnings and selection has led to a large part of the segmentation debate focusing on whether studies have adequately controlled for this heterogeneity. For example Quintin (2006) find that there is no evidence that earnings functions in the formal and informal sectors differ in equilibrium, using panel data from Argentina, once they adopt a semi-parametric propensity score matching approach that uses less restrictive assumptions than parametric approaches. Badaoui et al. (2008) find no evidence of an earnings premium for formal sector workers in South Africa once they use the panel dimension of their data to control for unobserved heterogeneity and account for only formal sector workers paying income tax. Botelho and Ponczek (2011) find a large premium for formal sector employees in Brazil using Ordinary Least Squares (OLS), but this becomes a small but statistically significant premium after they use a fixed effects regression to control for unobserved, time invariant heterogeneity.

Consequences of wage inequality

Economic literature suggests several potential channels through which the consequences of wage inequality can be felt. There is, first, the political economy argument (Alesina and Rodrick, 1994) by which the median voter of a highly unequal economy may have a tendency to push for higher redistributive public expenditures and transfers and higher taxes (assumed to negatively affect capital accumulation) to finance the additional spending. There is also the so-called socio-political instability approach (Alesina and Perotti, 1996) by which individuals in highly unequal societies will have incentives to engage in activities outside legal markets, such as crime and violence. For example, using a large panel of international homicide and robbery rates, Fajnzylber, Lederman and Loayza (2002) show that countries with higher inequality levels tend to have higher crime levels: on average a 1 percentage increase in the Gini coefficient appears to increase crime rates by between 1 and 4 percent. Finally, there are economic arguments

linked to the existence of credit constraints (e.g. Galor and Zeira, 1993), by which such constraints coupled with fixed costs and indivisibilities can prevent poorer individuals from investing in education or physical capital.

The differences in educational attainment between the poor and the rich lead to much higher differences in incomes due to the convexity of returns to education. Indeed, the returns to education increase significantly after finishing secondary school, a condition rarely met by children from lower quintile households. This fact not only helps explain the strong persistence of high income inequality given the low observed educational mobility, but actually in conjunction with the presence of credit constraints contributes to explain the low educational mobility itself. Poor parents, who face the need to keep children in school for an extended period of time to actually reap the benefits of their investment in education, also face very high opportunity costs from income forgone from children work, especially during periods of adverse income shocks. The high desertion rates observed among children from poor households should hence not come as a surprise. Actually, this is the main economic rationale of the Conditional Cash Transfers programs that have become so popular in many countries of Latin America in recent years. By lifting the credit constraint, such transfers help effectively reduce the opportunity cost of keeping children in school for poor households that enter the program (Lopez and Perry, 2008).

3.0 Research Methodology

3.1 Data

The study used the 1991 and 1996 priority surveys, the 2002 and 2010 rounds of the Living Conditions and Monitoring Survey and the 2012 Labour Force Survey. All these surveys were conducted by the central statistical office, are all nationally representative and use the similar design. In all these surveys, a two-stage clustered sampling strategy is used to choose the final sample of households. The study focused on paid employed workers in the surveys aged 15 – 65 years old. Thus questions from the section on economic activity and particularly monthly wage earnings in the survey were of primary interest.

3.2 Model and Data

The study estimated the wage variances at various points for different quintiles decomposed by individual characteristics such as education, experience and gender. These statistics were then used to formulate a trend of the wage differential over the reference period.

The Juhn-Murphy-Pierce (JMP) methodology is then applied to the data to decompose the distribution of the wages. The JMP methodology prescribes a tool for describing the components of wage density changes that could be attributed to measured prices, measured quantities and residuals (which they referred to as unmeasured prices and quantities).

The wage equation in time t can be written as:

$$Y_{it} = X_{it} \beta_t + u_{it} \quad (1)$$

Where Y_{it} is the log of monthly wage for individual i in year t , X_{it} is a vector of individual characteristics (including experience and education effects). And u_{it} is the component of wages accounted for by the unobservable variables. For our purposes it is useful to think of this residual as two components: an individual's percentile in the residual distribution, θ_{it} and the distribution function of the wage equation residuals, $F_t ()$. By definition, of the cumulative distribution function, we have

$$u_{it} = F^{-1}(\theta_{it}|X_{it}), \quad (2)$$

Where $F^{-1}(\cdot|X_{it})$ is the inverse cumulative residual distribution for the workers with characteristics X_{it} in year t .

In this framework, changes in inequality come from three sources: changes in the distribution of individual characteristics (that is changes in the distribution of X 's), changes in the price of the observable skills (that is changes in the β 's) and changes in the distribution of the residuals. If we define $\bar{\beta}$ to be the average prices for observables over the whole period and $\bar{F}(\cdot|X_{it})$ to be the average cumulative distribution, we can decompose the level of inequality into corresponding components as

$$Y_{it} = X_{it}\bar{\beta} + X_{it}(\beta_t - \bar{\beta}) + \bar{F}(\theta_{it}|X_{it}) + [F_t^{-1}(\theta_{it}|X_{it}) - \bar{F}(\theta_{it}|X_{it})] \quad (3)$$

The first term captures the effect of a changing education and experience distribution at fixed prices. The second term captures the effects of changing skill prices for observables at fixed X 's, and the final term captures the effects of changes in the distribution of wage residuals. Armed with this simple framework, we can reconstruct what the wage distribution would look like with any subset of components held fixed. For example, with fixed observable prices and a fixed residual distribution, wages would be determined as

$$Y^1_{it} = X_{it}\bar{\beta} + \bar{F}(\theta_{it}|X_{it}) \quad (4)$$

In the study, we estimate how this distribution would have changed through time by predicting wages for all workers in the sample in year t using the average coefficients, $\bar{\beta}$, and computing a residual for each worker based on his actual percentile in that year's residual distribution and the average cumulative distribution over the full sample. The major advantage of this over the more standard variance accounting framework is that it allows us to look at how composition changes have affected the entire wage distribution of observables. We can determine how changes in the distribution of observables have affected other inequality measures such as the inter-quartile range or the ninetieth percentile differential or how the effects have been different for inequality above and below the mean.

Allowing for both observable prices and observable quantities to vary through time, then we are able to generate wages by

$$Y^2_{it} = X_{it} \beta_t + \bar{F}^{-1}(\theta_{it}|X_{it}) \quad (5)$$

In this case we predict wage for each worker in year t given his observable characteristics and the wage equation estimated for year t and again assign him a residual based on the cumulative distribution for all years. Finally, we allow observable prices and quantities and the distribution of residues to change through time, we obtain

$$Y^3_{it} = X_{it} \beta_t + F^{-1}_t(\theta_{it}|X_{it}) = X_{it} \beta_t + u_{it} = Y_{it}, \quad (6)$$

This replicates the actual wage distribution since $u_{it} = F^{-1}(\theta_{it}|X_{it})$ by the definition of the cumulative wage distribution.

With the JMP technique, we are able to calculate the distribution of Y^1_{it}, Y^2_{it} and Y^3_{it} for each year and attribute the change through time in inequality in the Y^1_{it} distribution to changes in observable quantities. We then attribute any additional change in inequality in Y^2_{it} to changes in observable prices, and finally we attribute any additional changes in inequality for Y^3_{it} beyond those found for Y^2_{it} to changes in the distribution of unobservables (that is changes in unmeasured prices and quantities).

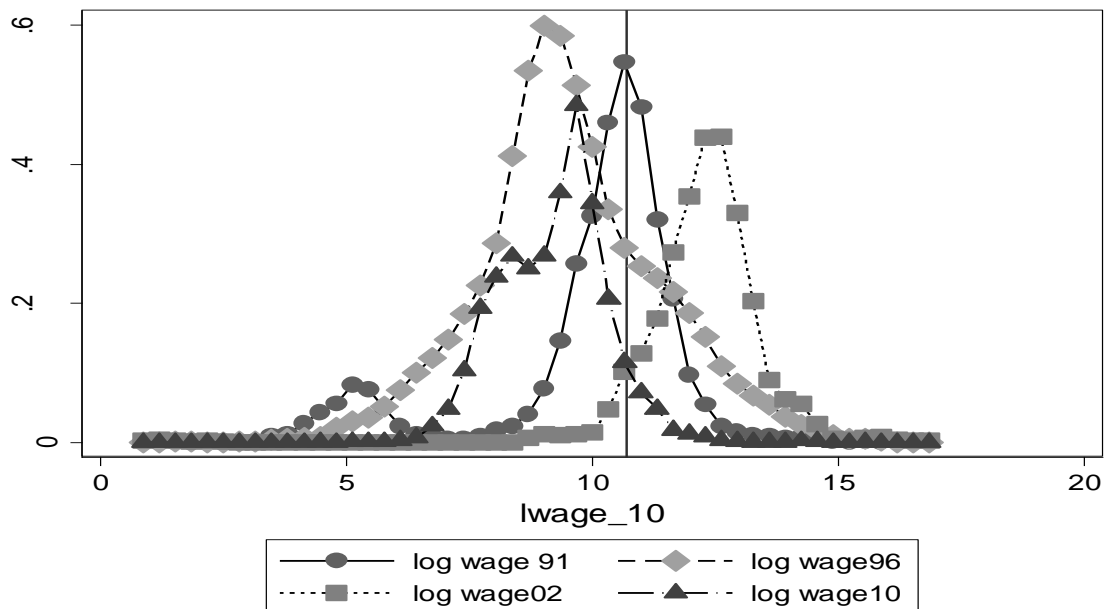
4.0 Presentation and Analysis of the findings

The section presents the findings of the study as outlined in the objectives. The results of the study are then analysed in the context of the reviewed literature to assess how the Zambian experience compares with the rest of the world.

4.1 Wage inequality trends

A compilation of the Kernel density functions¹ described in figure 1 below shows that real wage² inequality has declined between 1991 and 2010. It is apparent that the wage distribution has become relatively flatter in 2010 than in both 1991 and 1996. The 2002 distribution is however not comparable to the other data series as can be seen. This finding is quite contrary to the studies expectation and the literature reviewed as it suggests a decline in wage inequality while the global position of the reviewed literature suggests otherwise.

Figure 1 Kernel Densities of real wages 1991 - 2010



¹ Kernel density estimation (KDE) is a non-parametric way to estimate the probability density function of a random variable. Kernel density estimation is a fundamental data smoothing problem where inferences about the population are made, based on a finite data sample. A kernel distribution can be used when a parametric distribution cannot properly describe the data, or when you want to avoid making assumptions about the distribution of the data. This distribution is defined by a smoothing function and a bandwidth value that controls the smoothness of the resulting density curve.

² Real wages are defined as wages measured in 2009 constant prices.

Figure 2 below shows that the mean of the nominal wage has steadily risen between 1991 and 2010 while the variance has moved in the converse direction. However, when the log of real wages (measured in 2009 prices) are taken, the mean wages indicate a constant-slightly rising trend over the same period as depicted in figure 3. This implies that on average wages in Zambia have remained relatively constant over the review period while the variations in the group distribution of the wages, as measured by the variance, have been declining over time indicating a narrowing of wage inequality over the reference period.

Figure 2 Log - nominal wage Mean & Variance Trend: 1991 - 2010

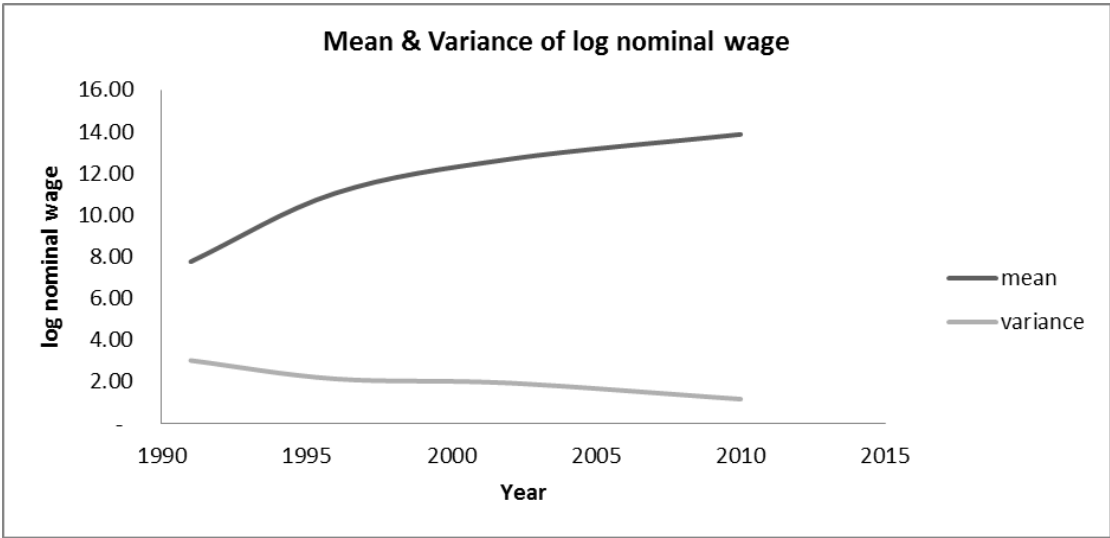
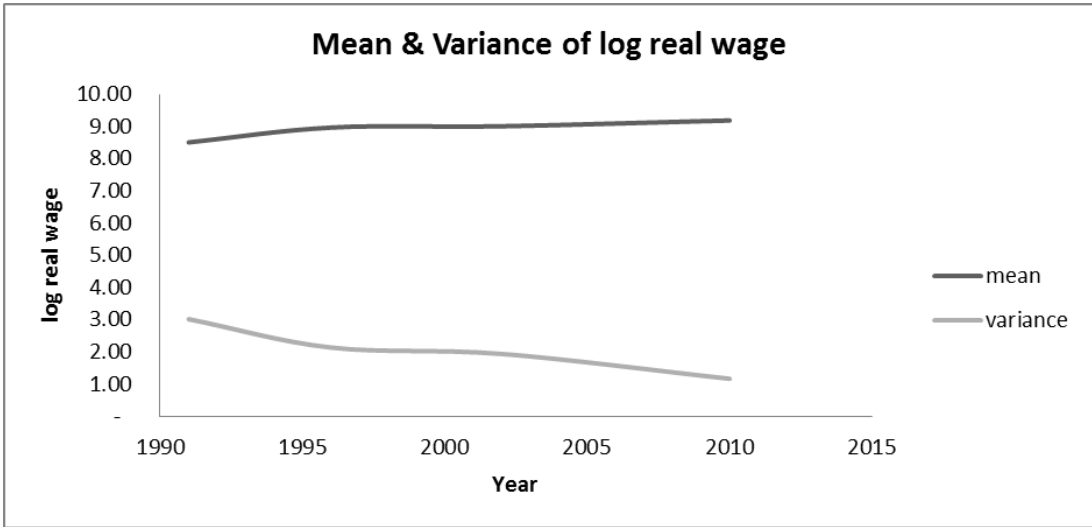


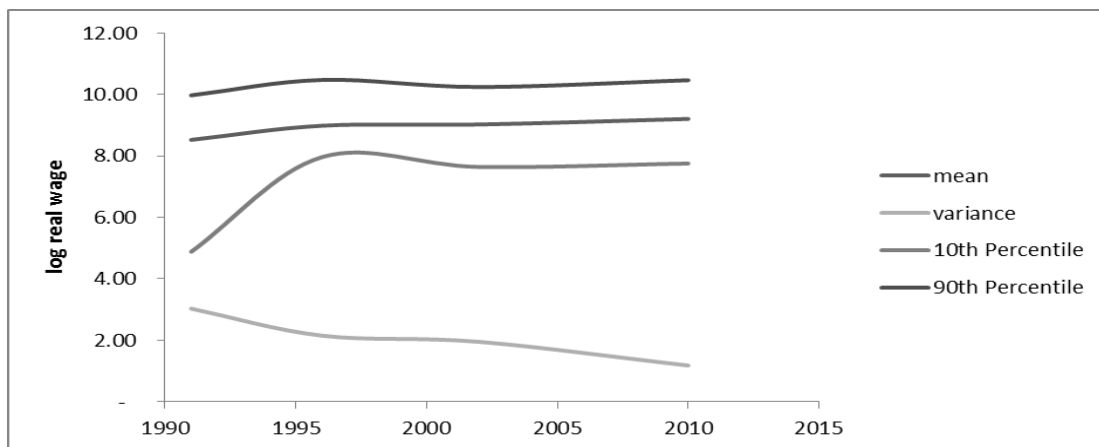
Figure 3 Log-real-wage Mean & Variance Trend: 1990 - 2010



This presents a stark contrast to the general global trend observed in the literature (Davis, 1992; Murphy and Pierce, 1993; Blau and Kahn, 1996; Katz, Loveman and Blanchflower, 1995; Topel, 1997) where the observed wage variance has been increasing signifying increased wage inequality. This difference could however be explained by the fact that the current study only analyses the wages of paid employed workers in the Zambian labor force, who may have much more favorable human capital characteristics.

Figure 4 below highlights a convergence in the log of wages towards the mean particularly for workers in the 10th percentile. There is a sharp increase between 1991 and 1996 in the wages of employees in the 10th percentile but this increase remains constant in the period 1996 – 2010. The high income wage earners however report a steady growth in their nominal wages throughout the reference period a phenomenon not unique to this category alone. This narrowing in the gap between the high wage earners (represented by the 90th percentile wage distribution and the low wage earners represented by the 10th percentile wage distribution) can explain the declining wage gap over the reference period as depicted by the constantly declining variance³.

Figure 4 Log of Real wage trends (mean variance and percentiles)

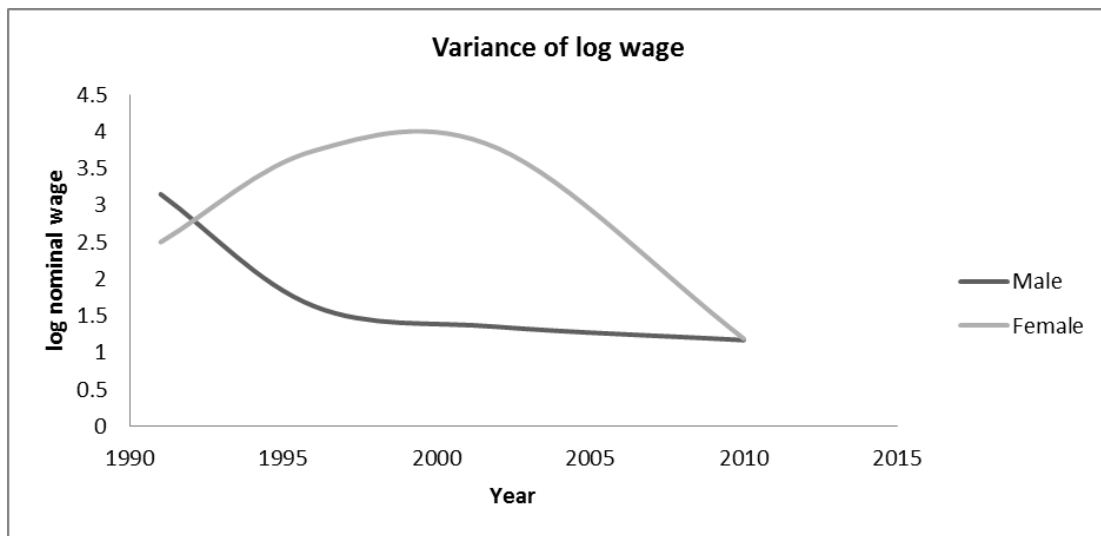


³ The percentile ratios shown in the appendix further attest to the declining wage inequality trends depicted by the declining wage variance and observed narrowing of the percentile distributions. Furthermore, the Gini-coefficient trend (shown in the appendix) attests to the observed declining wage inequality in Zambia

4.1.1 Gender and Wage Inequality

A further introspection of the wage inequality trend among males and females in the dataset as depicted in figure 5 below shows that wage inequality is high and initially rising for women until the early 2000s when it starts to decline. The trend among men however shows that wage inequality has been steadily declining since 1991. Even so, there is convergence in the inequality levels for both men and women in 2010. The high inequality among females could be explained by few highly educated females in the labour force in the early 1990 – 2000⁴ which implied a larger variation between the lowly paid uneducated (majority) and the few highly paid educated (minority) women employees.

Figure 5 Wage inequality trends by gender



⁴ Figures 10 and 11 in the appendix show the education attainment of paid employed women in Zambia. It confirms that relatively few women had more than secondary education in this period

The Zambia Millennium Development goals report (2003:9) documents that the National Gender Policy was implemented in 2000. This policy attempts to redress gender imbalances by promoting, inter alia, equality in access to all levels of education and training (formal and non-formal) and by promoting and increasing participation of women in decision making bodies. Additionally, Government established a Gender Management System, which is a holistic and system-wide approach for gender mainstreaming, for use by government in partnership with stakeholders, including civil society and the private sector. In addition to the National Gender Policy, government also put in place a supportive environment for other partners (like FAWEZA) working to promote girls' education and empowerment of women. At the international level, Government has committed itself to all the gender instruments and conventions including the Beijing Platform for Action and the SADC Declaration and its addendum on Violence against Women of 1997.

The government has further employed Strategies such as the 50-50 Enrolment policy whereby schools were by law compelled to enrol equal numbers of girls and boys at Grades 1, 8 and 10, and the creation of co-education public schools and colleges were implemented in a bid to encourage women education. Other strategies included the conversion of Boys-only public secondary schools into Coeducation High schools; the introduction of the Re-entry Policy in 1997 and the extensive classroom construction component of the Basic Education Sub-Sector Investment Programme (BESSIP, 1998-2002) to improve access to basic education for Grades 1-7 to all eligible Zambian children (Nkosha et al, 2013).

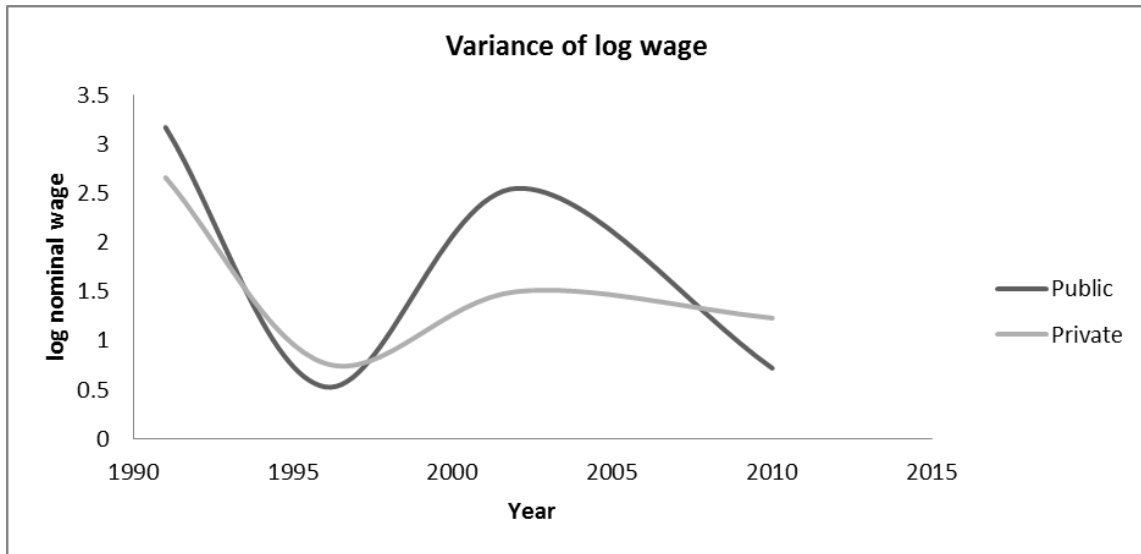
It can further thus be inferred that these deliberate policies to increase women's enrolment in schools and their subsequent preferential employment can account for the declining inequality among the paid women workers.

4.1.2 Public versus Private wage inequality

In analysing the wage inequality by public and private sector employment, we define all paid employees working in local and central government, and all employees in parastatal institutions as belonging to the public sector while all paid workers in the dataset outside this criterion were regarded as private sector employees. The analysis reveals that wage

inequality as measured by the log of the wage variance has primarily been higher in the public sector than it has in the private sector which is consistent with the results from Nielsen and Rosholm (1999:173) in their study on the public-private sector wage gap in Zambia in the 1990s. This trend however reverses after 2008 and we see that wage inequality as measured by the variance rises and is higher among private sector employees than the public sector employees as depicted in figure 6 below.

Figure 6 Public vs. Private Sector Inequality

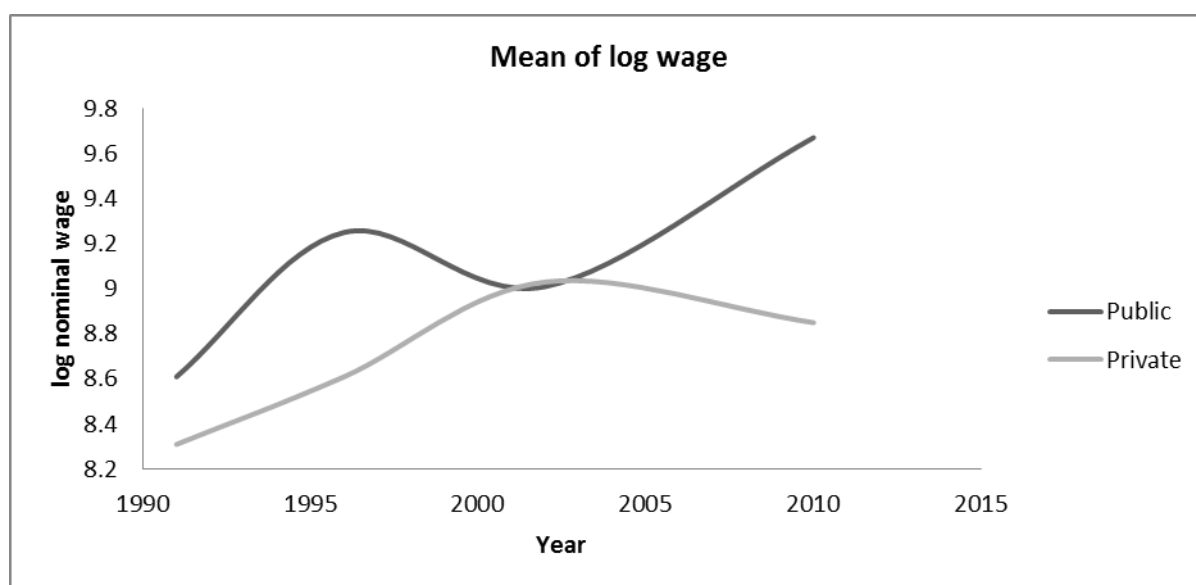


Nielsen and Rosholm (1999) find a positive public-private sector wage gap favouring the public sector in the 1990s which can be seen above. This picture is consistent with the results as depicted in figure 6 below. Public and private sector wages converge in 2002 and thereafter, they move in opposite directions with the wage gap further widening in favour of public sector employees in 2010. Thus it can be inferred that the public-private sector wage gap has remained consistently in favour of public sector employees and further that inequality within the public sector has been sharply declining over the last decade while it has been on the increase in the private sector during the period 1990 – 2010 as shown in figure 7 below. These shifts could be attributed to the different policy reforms (Structural Adjustment Programs, the HIPC programs, etc.) over this period.

The lower wage inequality in the public sector since 2009 can be attributable to the differences in the wage-setting mechanisms of the private sector. The schooling achievements between the two

sectors can also be used to explain the public private sector wage gap. This is so because on average, the public sector employs more educated people on average than does the private sector.

Figure 7 Public - Private sector wage premium



These findings are consistent with the findings of Nielsen (2001: 178) who confirms the standard finding that wages in the large and strongly regulated public sector have traditionally been higher than in the private sector. Their results show a positive gap in favour of the public sector, which increases over time, especially among the least educated at the lowest quintiles of the conditional earnings distribution. In the upper part of the wage distribution, the public –private wage gap is almost unchanged over time but it decreases (to become negative) for those with the highest levels of education. The results thus suggest that the low-skilled generally gain more from employment in the public sector, whereas private employment may be just as lucrative for the high skilled.

4.1.3 Wage inequality and Education

Analysing the log wage variance by education tells a consistent story to the general wage variance trend. It can be seen from figure 8 below that for all education levels, across all sectors, the wage variance has been declining over time and tending towards convergence in 2010. The wage Inequality as measured by the wage variance has consistently been lowest among workers with a tertiary level of education and highest among workers with primary

education. While the decline in the wage inequality among highly educated workers has been smooth, it is not so for workers with primary and secondary levels of education.

Figure 8 Log wage trend by Education

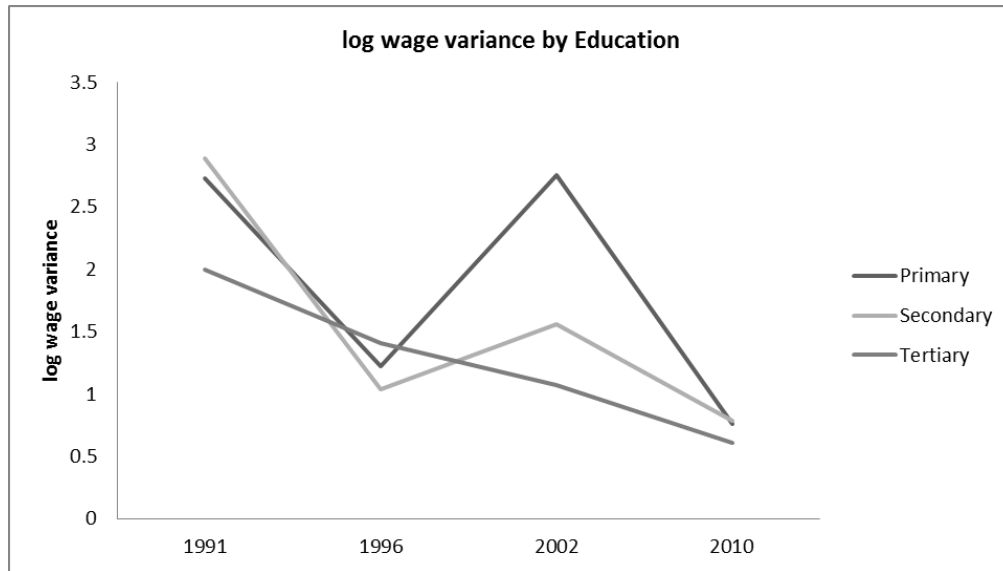
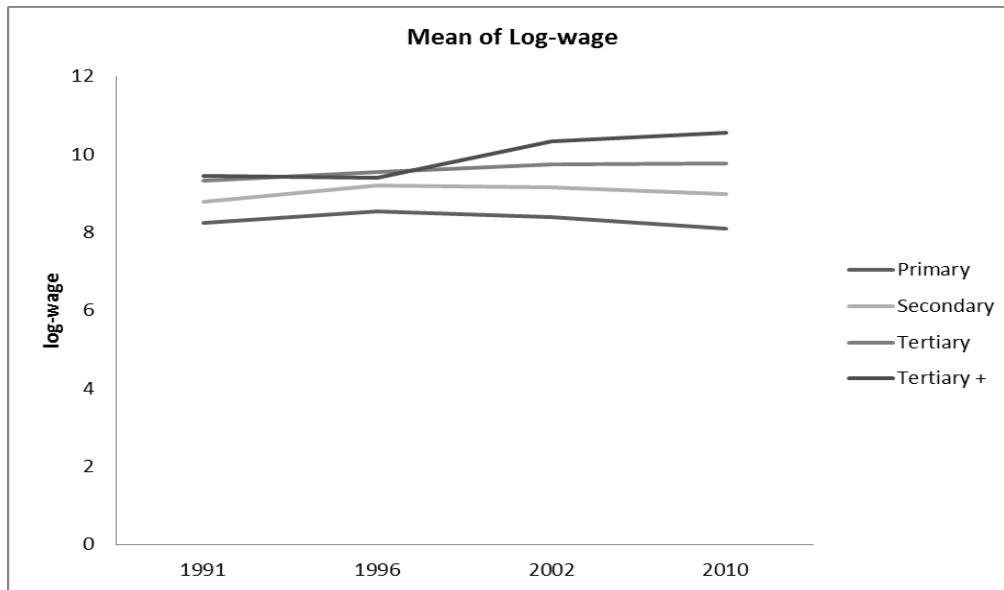


Figure 9 further illustrates that while the log of real wages (measured at 2009 prices (CPI)) has remained constant to slight decline over the period for workers with less than tertiary level of education, the picture is different for workers with at least tertiary education (13+ years) who record an increase in their average wages over the same time. This shows that the returns to education have been high for individuals who have at least 16 years of education over their entire period. This result is consistent with Mphuka and Simumba (2012: 20) who established that returns to education in Zambia were lowest at primary level and keep on increasing at higher levels. Mphuka and Simumba (2012) further conclude that returns to education are highest at tertiary levels thus confirming the observed results.

Figure 9 Log wage mean by education



4.2 Decomposing Wage Inequality

A regression of the log of real wages on a workers education attainment, experience, a square of the experience, work location (that is rural or urban), gender and sector employment (that is public or private) was for 1996 and 2010 observations. The 1996 observations were set as the basis for comparison of results and the JMP methodology was applied to the estimates of the two data points. Table 1 below shows the results of these regressions:

Table 1 Wage determination regression results

	1996		2010	
<i>Inreal-wage</i>	Coefficients ⁵	Standard Error	Coefficients ⁶	Standard Error
<i>Education</i>	0.1477	0.0036	0.2298	0.0032
<i>Experience</i>	0.0602	0.0026	0.0355	0.0034
<i>Experience</i> ²	-0.0009	0.0001	-0.0003	0.0001
<i>Urban</i>	0.2396	0.0285	0.0928	0.0243

⁵ The coefficients are significant at 5 %

⁶ The coefficients are significant at 5 %

<i>Female</i>	-0.2439	0.0227	-0.1686	0.0194
<i>Public</i>	0.2439	0.0210	0.2636	0.0196
<i>_constant</i>	6.4932	0.0547	5.7511	0.0537
<i>R-squared</i>	0.3879		0.4956	

Education

The data reveals that education significantly affects individual wages in the data. It can be seen that holding all other things constant, an additional year of schooling is associated with a 14.8 percent change in the monthly wages in 1996. The influence of education has further increased in that in 2010, an additional year of education was associated with a 23 percent increase in monthly wages emphasizing the increasing returns to education over time. This observation is consistent with the reviewed literature (Mphuka and Simumba, 2012 for instance) and further highlights the growing importance of education in improving wage incomes and the rising returns to education.

Gender

The gender wage premium has however declined over the review period. In 1996, females earned 24 percent less than their male counterparts while in 2010 they earned about 16 percent less than their male counterparts. It is worth mentioning, however, that gender still, though diminished, plays a very significant role in determining wages in Zambia which is further consistent with the reviewed literature (for instance Blau and Kahn, 2000; Blanchflower and Loveman, 1995; Mincer and Polacheck, 1974 etc.).

Public vs. Private sector

The public private sector wage premium has also marginally increased over the review period. In 1996 public sector employees earned 24 percent higher than their private sector counterparts while in 2010 this value increased to 30 percent. This could be attributed to the formal nature of public sector employment relative to the private sector. This result is further consistent with the reviewed literature in the study.

Others

Geographically, employees in urban location earned 24 percent more than those in rural areas in 1996. This value, however, significantly fell to only 9 percent in 2010. This implies that though workers in urban areas still earn higher incomes than those in rural areas, the wage gap between the two categories has declined significantly in the review period.

The importance of individual work characteristics like experience has further declined over the two periods. In 1996, an additional year of experience increased monthly wages by about 6 percent while in 2010 an additional year of experience only raised monthly wages by 4 percent. This is particularly important as Zambia has a high population of youths relative to more experienced adults.

Overall, it is worth noting that all the variables discussed above are significant at 5 percent.

Quintile regression and Thiel T measure results

A quintile regression analysis of the log of monthly wages reported in the 2012 Zambia Labour force survey (CSO) is presented in Table 2 below.

Table 2: Quintile regression results of log monthly wages (2012)

Log(monthly wage)	Coefficients (significant at 1%)							
	Education	Female	Urban	Tenure	Union	Experience	Youth	Married
Q ₂₅	0.135	-0.068	0.22	0.120	-0.67	0.012	0.072	0.179
Q ₅₀	0.146	-0.107	0.16	0.097	-0.58	0.015	0.013	0.141
Q ₇₅	0.153	-0.118	0.18	0.068	-0.40	0.021	0.169	----
Q ₉₀	0.17	-0.152	0.20	0.051	-0.18	0.026	0.146*	-----

*significant at 5%

The simultaneous quintile regression of the log monthly wages shows that an additional year of education accounts for adds 13.5 percent to individuals' monthly wages for workers in the lower income brackets while an additional year of education adds 17% to the monthly wages for workers in the higher income brackets. This further reinstates the established notion that education has a significant impact on wages and hence may account for the observed inequality.

Gender is also seen to play an important role in determining wages. It can be observed that across all quartiles, women earn less relative to their male counterparts (denoted by the negative signs on the coefficients). However, the variation is higher among higher wage earners (16%) than among the low wage earners (7%).

Similarly Union membership has a significant impact on the monthly wages in Zambia particularly among the low income earners. Low wage earning union members, earned 67 percent less than low wage non-union members, while for high wage earners, union members earned 18 percent less than the non-unionised workers. This finding is however curious and contrary to the literature as the expectation is that the unionised workers should earn more than the non-unionised workers particularly among low-wage earners. Nonetheless, this finding highlights the importance of labour market institutions such as unions in the country a finding consistent with DiNardo, Fortin and Lemieux (1996). Furthermore, youth inequality is more defined in higher income brackets than in lower income brackets possibly due to the confounding effects of experience and education.

Females in low wage earning groups earned about 7 percent less than their male counterparts in the same category. The gender wage Inequality was however more pronounced in higher income brackets especially at the top where women earned about 15 percent less than their male peers. Overall Inequality due to Sex as measured by the Gini coefficient was 0.6. The same value was reported for inequality across the different experience groups and rural/urban categories.

JMP Decomposition

Table 3 below shows that both the mean and median wages have increased between 1996 and 2010. This is denoted by the total positive increase in the mean and median wages of 20.38 percent and 40.1 percent respectively. However, the contribution of differences in observable quantities (human capital aspects) accounts for the largest share of the wage differences and opposed to the contribution of differences in observable prices. The positive effect of characteristics on the median indicates that if workers' attributes had been rewarded the same in 1996 as in 2010, real wages should have risen, not fallen. The lower level of wages is explained by changes in coefficients, that is how workers characteristics are

rewarded. This is mainly the consequence of a lower constant and not of lower return to human capital characteristics. Naturally, the effect of the residuals on the mean and the median is not significantly different from zero. Thus, the returns to individual characteristics such as education and experience have significantly increased between 1996 and 2010. Put another way, an individual with the same characteristics would earn more in 2010 than they did in 1996 due to among other things, the lower levels of inflation in 2010 relative to 1996 and the improved economic structure in Zambia

The results of this analysis are significant in that non skill variables like prices have had a reduced effect (negative) on the wages which can be explained by inflation. Real wages have remained relatively constant over the review period as has already been established above. Thus the observed wage inequality (though declining) has come about as a result of the increasing returns to observable quantities which are individual characteristics.

Table 3 Juhn-Murphy-Pierce decomposition of wages

Juhn-Murphy-Pierce decomposition (reference estimates: logwage2010)				
	T	Q	P	U
Mean	0.2038	0.4266	-0.2250	0.0015
Median	0.4090	0.5680	-0.1698	0.1070
T = Total difference (lwage2010-lwage1996)				
Q = Contribution of differences in observable quantities				
P = Contribution of differences in observable prices				
U = Contribution of differences in unobservable quantities and prices				

Table 4 below isolates the effects of the block of variables (Education and Public sector employment). It can be seen that the individual effect of education on the observed differences is more significant than the effect of sector affiliation. This further highlights the fact that education is the most important characteristic in the determination of wage inequality in the observed data series. The public sector effect only worked to reduce the wage differentials over the two periods deflating its importance in explaining the wage inequality distribution over the review period.

Table 4 Juhn-Murphy-Pierce decomposition: The block effects (Education and Public sector Employment)

Juhn-Murphy-Pierce decomposition (reference estimates: lwage2010)				
	T	Q	P	U
Mean	0.2031	0.4266	-0.225	0.0015
T = Total difference (lwage2010-lwage1996) Q = Contribution of differences in observable quantities P = Contribution of differences in observable prices U = Contribution of differences in unobservable quantities and prices				
Quantity effect of (blocks of) variables				
	Education	Public		
Mean	0.478998	-0.28545		

5.0 Conclusions and Recommendations

The global trend for rising inequality observed in the literature motivated the study's inquest. Particularly the study sought to provide clarity on the inequality trends and the determinants of the observed inequality owing to the lack of comprehensive literature on the subject matter. Furthermore, the study sought to isolate the influence of human capital characteristics such as education on workers' wages and further document the influence of gender on wage inequality among the Zambian labour force. Additionally, the study sought to show the trend and influence of the public-private sector wage gap as a source of wage inequality in Zambia. It was hoped that the results of the study would inform the policy makers on how best to tackle the problem of wage inequality and further provide room for further research in the field.

To accomplish its set objectives, the paper employed the use of secondary data from the Living Conditions and Monitoring Surveys of the Central Statistics Office for the period 1991 – 2010 and latest rounds of the Zambia Labour Force Survey. Percentile and variance trends were computed to analyse the wage inequality trends over the period 1991 – 2010. A quintile regression of the data was estimated to show the extent of inequality among different wage distribution. Finally, The JMP method of inequality decomposition was used to isolate the effects of observable characteristics on inequality from those of the observable prices and the unobservable effects. In this analysis, wage incomes from 1996 were compared to those obtaining in 2010.

The study has ascertained that wage inequality has been relatively declining throughout the reference period (1991 – 2010) while the real wages (measured at 2009 constant CPI prices) have had a constant and slightly rising trend. This observation has been contrary to what has been observed globally in the literature. However, it may be worth mentioning much of the consulted literature does not extend its analysis to beyond the early 2000s. A further significant finding is that while real wages remained relatively stable over the reference period, it was not the case for workers tertiary education or higher. The Gender wage gap has further reduced. Wage inequality was initially highest among women than men, however, as at 2010, the data suggests a convergence in the within group inequality levels for both males and females. Likewise the public-private wage sector premium has been

declining though wages in the public sector have been observed to be higher than in the private sector. However, the inequality trend has been declining among workers employed in the public sector while it has been rising for private sector employees after 2002.

The study has since established that wage inequality has largely been driven by the increased return to human capital attributes and education in particular. The education premium has been the single-most important driver of wage inequality over the reference period. However, gender and experience have had a diminishing influence on wage inequality in Zambia while Union membership has a significant bearing on wage inequality outcomes. Thus the study has ascertained that in Zambia, the human capital model is best suited to explain wage inequality. However, it is apparent that segmentation characteristics as reflected in the gender wage gap, the public-private sector premium, unionization and rural-urban divides also have an undeniable effect on wage inequality. Nevertheless, the impact of these variables on wages in Zambia has been diminishing throughout the reference period.

5.1 Policy Recommendations

Emphasize tertiary education: The paper has established wage premiums have been increasing for individuals with tertiary education (more than 16 years of schooling) while this has not been the case for people with less than tertiary education. The paper thus recommends an emphasis on policies aimed at further increasing the distribution of tertiary educated workers. The current policies aimed at achieving universal access to primary and basic education will not do much to improve wage inequality in Zambia.

Equitable geographical distribution of Wages: Enclave development which focuses on urban areas at the expense of rural areas should be avoided to ensure an equitable distribution of wage income returns to all parts of the country and thus reducing regional inequality.

Reinforce gender empowering policies: Discrimination against women in the labour market needs to be redressed through increased monitoring of the implemented policies and encouraging women participation in the labour force. There is need to further augment the current provisions of positive discrimination for women in the labour force so as to further reduce the gender wage gap.

Encourage formalization of informal sector workers: The study notes that wage inequality is low among public sector employees that have such attributes as union membership and pension pay. As such encouraging informal sector employers to formalize their establishments would help reduce the current inequality within the sector to the levels observed among public sector employees.

5.2 Limitations of the study and areas for further research

- The major limitation from the study was the lack of dependable panel or time series data that can be used to estimate a model for wage inequality over time. This was largely because the LCM Surveys which the study will draw from collects repeated cross sectional data. Obviously, the major limitation of repeated cross-sectional data is that the same individuals are not followed over time, so that individual histories are not available for inclusion in a model, for constructing instruments or for transforming a model to first-differences or in deviations from individual means. All of these are often applied with genuine panel data. On the other hand, repeated cross-sections suffer much less from typical panel data problems like attrition and nonresponse, and are very often substantially larger, both in number of individuals or households and in the time period that they span.
- Notwithstanding this shortcoming, the study has established a trend in wage income inequality over the period 1996 – 2010. It would be prudent however if future research can benefit from more updated data so as to analyse and isolate the impact of the minimum wage law implemented in 2012 on wage inequality in the country.
- Additionally, the study has observed that education seems to have a lesser impact on inequality in Africa than in other regions, thus a study should be instituted to find out why this is the case
- Furthermore, a simulation study that depicts the impact of different policy changes (such as the minimum wage, income tax revisions and wage harmonization in the public sector) on wage inequality should be done.

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Appendix

Figure 10 Paid women employees education attainment

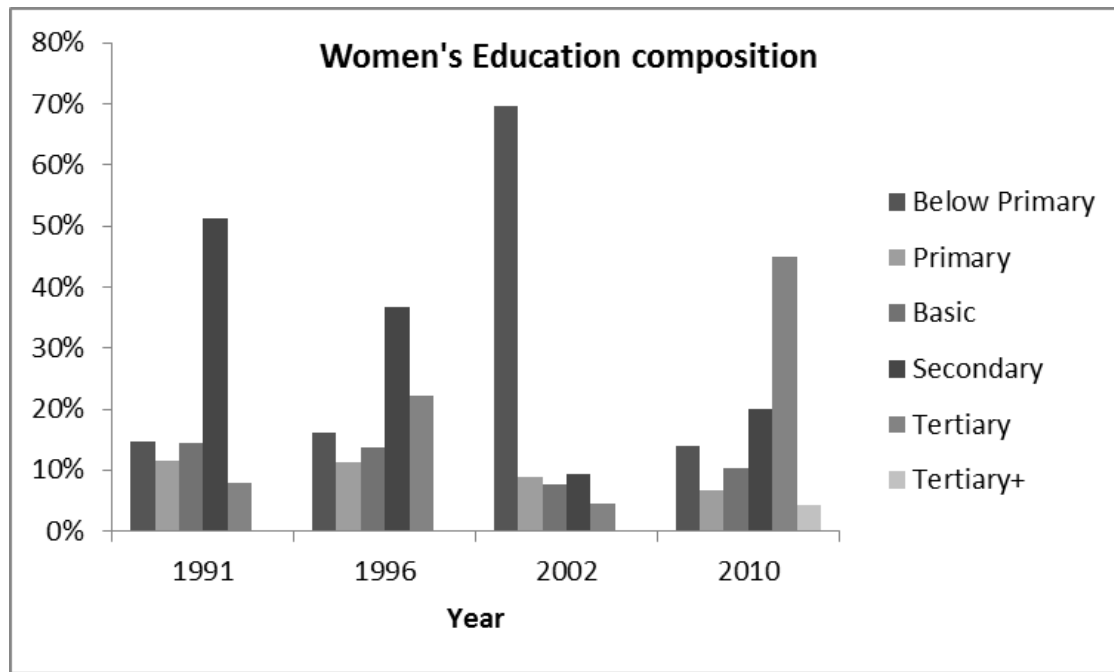
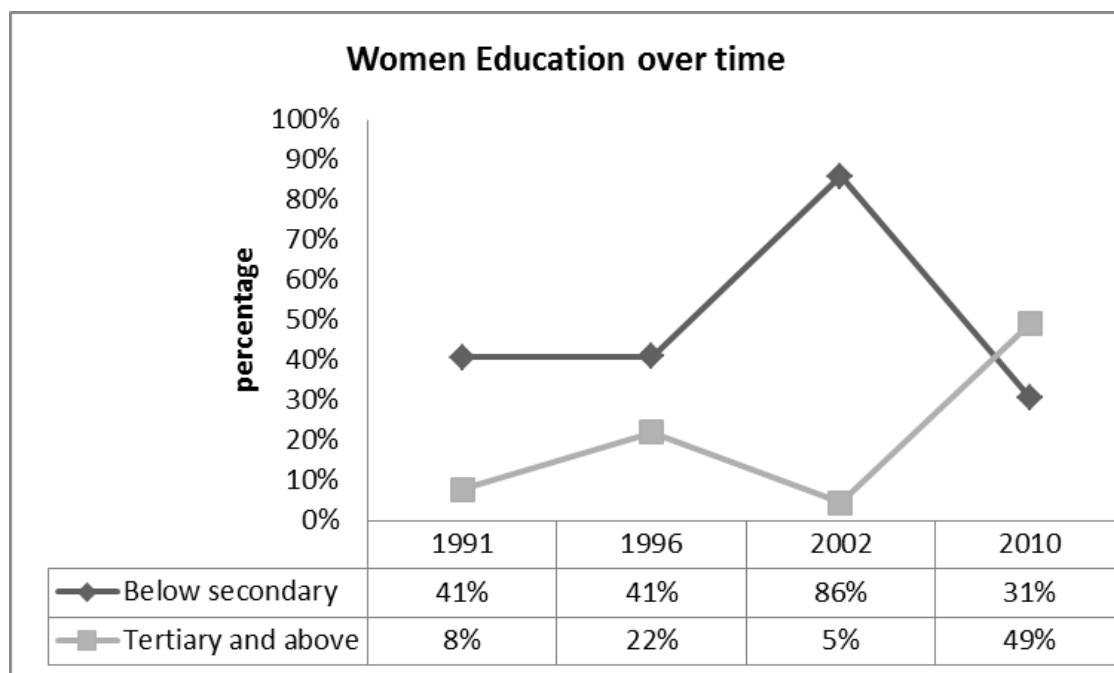


Figure 11 Paid women's education attainment trend



Inequality as measured by the percentile ratios shows a movement towards convergence around unit. However, for all the ratios observed, there has been stagnation around 1.5 and 0.5 for p_{90}/p_{10} and p_{10}/p_{50} respectively. On the other hand the p_{90}/p_{50} ratio has been constant around 1. This shows that wage inequality has remained relatively constant between 1996 and 2010 which is quite surprising considering all the developments that have occurred in the economy over this period.

Figure 12 Percentile Ratios

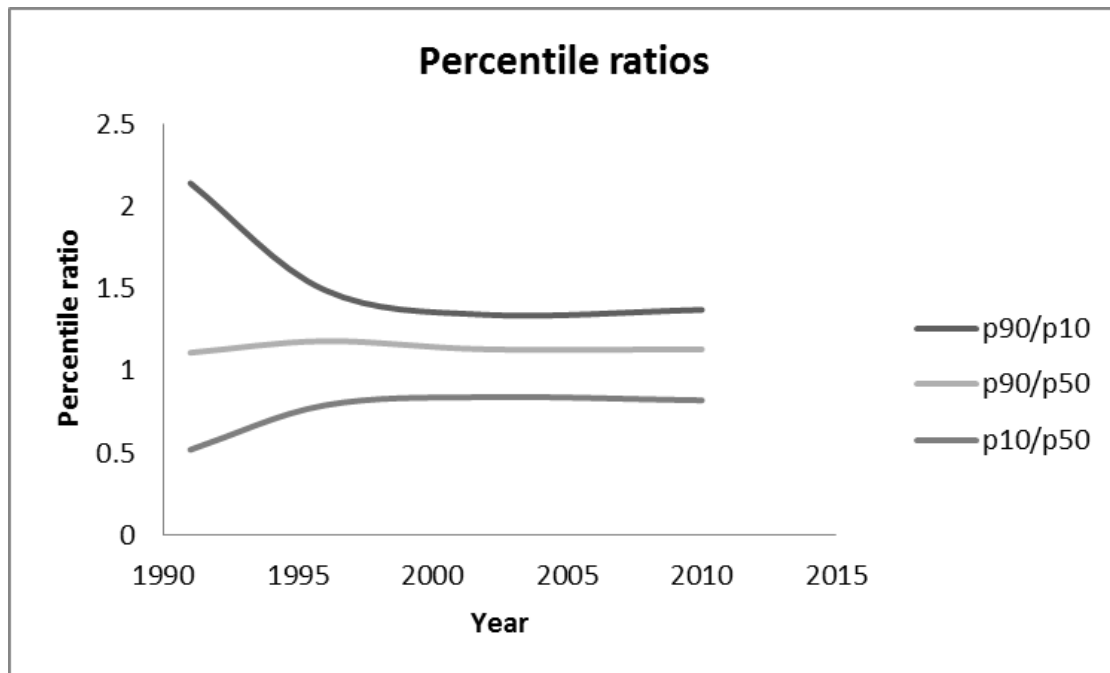


Figure 13 Gini coefficient trends of real wages

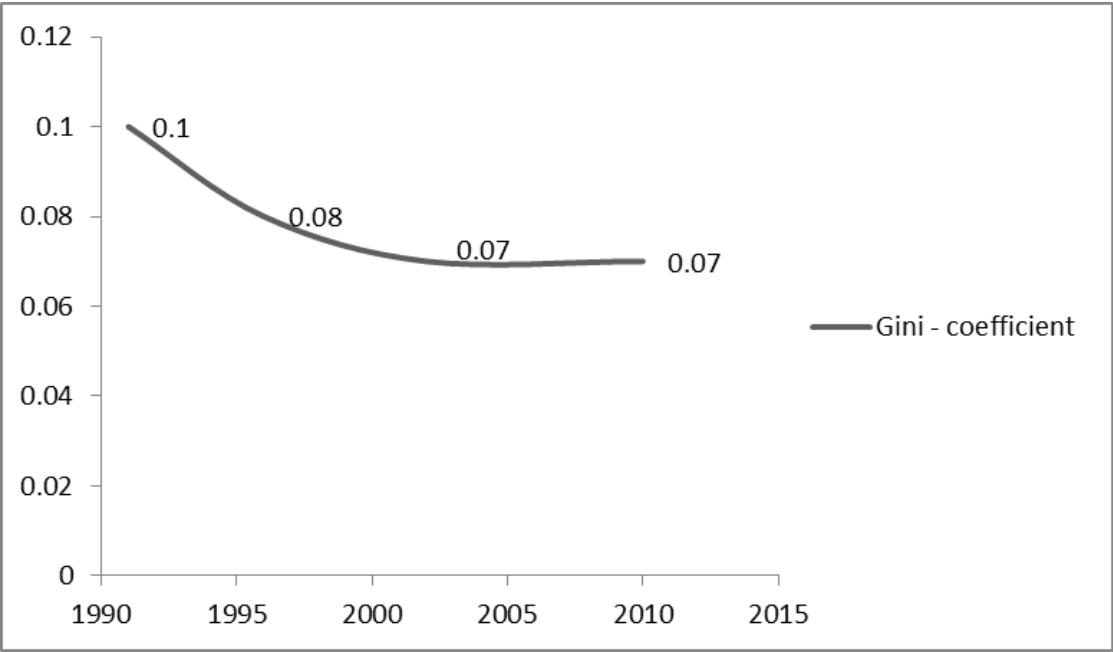


Figure 14 Women's wages in Public vs. Private sectors

