Bank *of* Zambia

The Effect of Contractionary Monetary Policy
on Gender in Zambia

By
Chrispin Mphuka
Oliver Kaonga

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Chrispin Mphuka
Oliver Kaonga[1]

University of Zambia
Great East Road Campus

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Abstract

This paper assesses the distributive effect of contractionary monetary policy on gender in Zambia from 2012 to 2014. Using district-level panel data built from nationally representative labour force survey data, we find that monetary policy has a disproportionate effect on the unemployment of men compared to women. This contradicts the hypothesis that women would be worse-off after a fall in aggregate demand following a rise in short-term interest rates to control inflation. The result suggests that in Zambia during this period of 2012 to 2014, the majority of the men were in vulnerable and unstable employment compared to women.

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1. Introduction

Globally, central banks focus on low and stable inflation as the primary goal of monetary policy. The main objective of monetary policy by Central Banks globally is to maintain low and stable inflation. This is with the recognition that high inflation is not good for the economy and the people particularly the poor. However, a singular policy goal of stability can potentially come at the cost of exchange rate appreciation and declines in output and employment (Takhtamanova and Sierminska, 2009). Since 2012, Bank of Zambia (BoZ) has used short-term interest rates (BoZ policy rate) to control inflation. Interest rate changes are intended to work on the demand side of the economy2. In theory, an increase in the BoZ policy rate raises the cost of lending by banks, thereby reducing borrowing for investment and consumption and hence aggregate demand. These effects of contractionary policy on employment are summarized in the concept of the sacrifice ratio, measured as the percentage decline in employment (alternatively, output) in response to a one percent decline in the rate of inflation (Seguino and Heintz, 2012). Additionally, such contractionary monetary policy and the resulting fall in demand can have adverse distributional impacts on women and other groups such as the youth who tend to be concentrated in vulnerable employment (Seguino and Heintz, 2012, Seguino, 2019). What is perhaps important is the channel through which monetary policy affects unemployment and particularly in an unequal manner between females and males. Takhtamanova and Sierminska (2009) offers a number of reasons why this could be the case in a developing country setup. They argue that job segregation, gender differences in labor market attachment and job tenure, and gender employment discrimination could all serve as mechanisms by which women and men experience different effects of monetary policy shocks. But they also argue that these effects could work in either direction in developed countries. This could possibly be the case in developing countries too.

Empirical evidence on the effects of monetary policy on unemployment is scarce and has mixed results. Braunstein and Heintz (2008) analysed data for 51 "inflation reduction episodes" in 17 low- and middle-income countries, which included Kenya and Mauritius as the only two countries drawn from Africa. Isolating inflation episodes using moving average to identify inflation episodes and Hodrick Prescott filter to establish long-run unemployment trends, they found that in 67% of the contractionary inflation reduction episodes, the rate of change of the female to male employment ratio fell below its long-term trend, suggesting that women's employment was disproportionately affected by the slowdown. However, the two African countries, Kenya and Mauritius, included in the study had mixed results. For Kenya, two inflation reduction episodes in 1975-1980 and 1981-1987 were identified. Of the two episodes, one was consistent with the conclusion that women's employment was disproportionately affected. Similarly, for Mauritius, of the three inflationary periods identified, only in two did they establish that women were disproportionately affected. This indicates that the effect of contractionary monetary policy on unemployment disparities on gender might differ from episode to episode even within the same country and from country

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2 For a detailed exposition of monetary policy in Zambia during this period and other periods see Muhanga and Zyuulu (2014)

to country. Therefore, the question of the distributive effect of monetary policy on female-male unemployment is best answered empirically.

The purpose of this study is to assess the effects of contractionary monetary policy on gender. We build a district level panel using micro level Labour Force Survey (LFS) data and regress the ratio of women's to men's unemployment ratio on the policy rate and other control variables. The findings suggest that an increase in the BoZ policy rate typically lowers the female to male unemployment ratio3. Because both the unemployment of females and males increase, it is the differential increase in the two unemployment rates that causes the ratio to fall. This suggests that men are more adversely affected in terms of unemployment following an increase in the BoZ policy rate. Also, the effect is larger when those in the estimation sample are limited to paid employees only or including self-employed but excluding unpaid family workers.

The remainder of the paper is as follows: Section 2 gives literature review on gender differences in unemployment as it relates to monetary policy; section 3 outlines the data and the methodology used in investigating the research problem; section 4 gives the results and a discussion while section 5 concludes.

2.   Gender, Unemployment and Macroeconomic Policy

This section looks at the literature on gender differences in unemployment and how these relate to macroeconomic policy. The first few paragraphs detail gender difference in various settings and why we would expect monetary policy to have differential effects. This is necessary for such a study but perhaps this needs to be motivated in the introduction/background section prior to this literature section.

Table 1 shows the selected statistics on Zambia's labour market summarised from various Labour Force Surveys. From the table, we notice that there is no systematic difference in the overall national unemployment rates. Whereas the unemployment for women was higher than that of men in 2012, the case is opposite in 2008 and 2014. Interestingly, the latest 2017 data shows that female unemployment is higher than that of men. It must be noted that the method used to arrive at this result is different from other years, hence caution must be exercised in its interpretation. The distribution of unemployment in rural areas follows a similar pattern to the national one. However, the urban statistics clearly show that women unemployment is larger than the men's rate, except for 2014. In sum, it is not possible to conclude that overall women's unemployment is higher than men's though this is the case in some periods.

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[3] Preferably it would be nice to see whether the ratio has a long-term threshold below which it falls or goes above. But in case of Zambia, such a threshold does not exist due to the short nature of employment data available.

Table 1: Selected Statistics on Zambia's Labour Market

Year	Labour Force	National Unemployment (Percent)			Rural Unemployment (Percent)			Urban Unemployment (Percent)		
	Total	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
2008	5,003,871	7.9	8.1	7.7	3.5	4	3	18	16.1	20.5
2012	5,966,199	7.8	6.3	9.2	3.2	2.7	4	14.2	11.4	17.1
2014	6,329,076	7.8	8.4	6.5	4.2	4.8	3.7	11.5	12.9	10.2
2017		12.6	11.9	13.5	12.1	12.9	10.9	12.9	11.2	15.2

Source: Labour Force Surveys: 2008-2017

Both theoretical and empirical evidence suggest that contractionary monetary policy has a differential impact on unemployment. This impact is seen in terms of different labour dynamics, including the skills of workers. In his theoretical work, Blanchard (1995), argues that an adverse aggregate demand shock such as a monetary contraction has "ladder effects," that adversely affect lower income individuals. Moreover, Blanchard and Katz (1997) assert that unskilled individuals have significantly higher labor supply elasticities than skilled individuals, and so a fall in the demand for labor as economic growth slows will have a larger effect on the employment prospects of less-skilled workers. It is therefore possible that an increase in unemployment following contractionary monetary policy is greater for low-skilled individuals than for high-skilled workers (Carpenter and Rodgers, 2004).

There are gender differences in the unemployment patterns among males and females both in developing countries and developed countries. These differences could be attributed to demand and supply factors. For example, Seguino (2004) assessed gender differences in unemployment rates in selected Caribbean countries and found that women are much more likely than men to be unemployed. For example, they found that female unemployment in Jamaica in in 2000 was 22.3 percent while male unemployment stood at 10.3 percent. In 2001, Guyana's female unemployment stood at 14.3 percent while male unemployment was 6.2 percent. They actually find that in the majority of the Caribbean countries unemployment was higher among women than men. They attribute this partly to national economic conditions and job segregation. As such, they argue that relying on economic growth to reduce gender inequality in job access may not suffice and hence they call for more targeted efforts to ensure that women stand a fair chance of being hired. On the supply side, women and men face different constraints in their decisions about whether or not to look for wage work. Norms and traditional structures of gender and kinship influence the social expectations of women and men in the household. Prevailing social norms in most African countries place the primary responsibility for domestic work and child care on women, while men are considered as financial providers.

Additionally, women's choices and the resulting outcomes are constrained by differences in men's and women's endowments of key resources, such as skills and time, as well as different preferences with regard to time use, occupation and discounting the future. These endowments and preferences are shaped by contextual factors including social norms and institutions that govern the roles of men and women in the household, economy and society. For example, improvements in education and skills may enhance a woman's agency, and thus her ability and interest in pursuing traditionally male-dominated higher-earning occupations. However, women especially young women, attain lower education levels compared to males and this tends to disadvantage employment of females (Chakravarty, Das and Vaillant, 2017; Azmat, Güell and Manning, 2006).

Gender inequalities in education are a result of supply and demand factors that interact with cultural considerations to limit the opportunity of females to gain an education. In some developing countries, the supply of education is strongly affected by the availability of a culturally acceptable environment for educating females. Although there may be access to schools in principle, in some cultures, schools would have to be built in a culturally appropriate way before parents would allow their daughters to attend (Stotsky, 2006). On the demand side, there are no sufficient regulations to firms on how they should not disadvantage females in employment by demanding the employment of males. Also certain jobs have traditionally been perceived as male areas making it hard for females to join in. On the contrary low skill factory jobs male be easily available and firms may demand females for such jobs. This is certainly going to influence how jobs are distributed among males and females.

Evidence from LFS in Zambia shows that women have a lower attainment of education. Fewer have attained any skilled training. For example, the 2012 LFS shows that 13 percent of males had skilled training compared to only 4.5 percent of females (GRZ, 2012). Moreover, the higher the level of education, the more skewed the distribution is in favour of men. Table 2 shows the distribution of education attainment in 2008, 2012 and 2014. Column two shows the total number of education attainment for those aged 15 years and above. The table shows that out of 6.3 million people at the age of 15 and above, the majority of the employed are up to secondary education level and only a small proportion are able to reach certificate and degree levels.

Therefore, the gender disaggregation of the education attainment reveals that at primary education level, women are in the majority exceeding half of those attaining education in all three years. The proportion changes at higher level of education with around 25% of those with a degree being women compared to men who account for the remainder. This just indicates that in the case of Zambia, women have lower levels of education endowment. This implies that in the case of a reduction in aggregate demand, the women would be more adversely affected compared to men. There are many studies that have come to this conclusion (e.g., Seguino and Heintz, 2012; Braunstein and Heintz, 2008).

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Table 2: Education Attainment by Gender 2008-2014

	Total Labour Force		Total Percent	Male		Female	
	Number	Percent Share		Number	Percent	Number	Percent
Year 2014							
Total	6,329,076	100	100	3,045,159	48.1138	3,283,917	51.9
Nursery	28,294	0	100	11,285	39.88478	17,008	60.1
Grade 1-7	2,567,741	41	100	1,086,932	42.33028	1,480,809	57.7
Grade 8-12	2,718,537	43	100	1,528,941	56.24132	1,189,596	43.8
A Levels	47,831	1	100	28,026	58.5938	19,805	41.4
Certificate	230,457	4	100	135,339	58.72636	95,119	41.3
Degree	39,504	1	100	29,315	74.20768	10,189	25.8
None	696,713	11	100	225,321	32.34058	471,392	67.7
Year 2012							
Total	5,966,199	100	100	2,885,146	48.4	3,081,053	51.6
Nursery	13,449	0	100	5,006	37.2	8,443	62.8
Grade 1-7	2,534,975	43	100	1,121,176	44.2	1,413,799	55.8
Grade 8-12	2,298,901	39	100	1,313,763	57.1	985,138	42.9
A Levels	37,375	1	100	23,302	62.3	14,073	37.7
Certificate	219,443	4	100	126,120	57.5	93,324	42.5
Degree	31,330	1	100	24,086	76.9	7,244	23.1
None	830,726	14	100	271,692	32.7	559,034	67.3
Year 2008							
Total	5003871	100	100	2,603,822	52.03615	2,400,049	48.0
Nursery							
Grade 1-7	2,168,526	43	100	1,018,816	46.98196	1,149,710	53.0
Grade 8-12	1,866,353	37	100	1,176,212	63.02195	690,141	37.0
A Levels	200,470	4	100	121,964	60.83903	78,506	39.2
Certificate							
Degree	23,632	0	100	17,487	73.99712	6,145	26.0
None	744,890	15	100	269,343	36.15876	475,547	63.8

Source: Authors' calculation from GRZ (2014), GRZ (2012), and GRZ (2008)

On the demand side, gender discrimination results in differential access to employment opportunities. Women are laid off first because employers presume that it is more important for men to be able to fulfil their traditional bread-winning responsibilities. The presumption that men should bear the primary financial responsibility for provisioning families has been linked with higher unemployment for women relative to men in OECD countries (Algan and Cahuc 2006). Differential hiring practices also contribute to gender segregation in employment (Braunstein and Heintz, 2008). For example, labor intensive exporters prefer

to hire women both because women's wages are typically lower than men's, and because employers consider women to be more productive in these types of jobs (Anker and Hein 1985; Elson 1996). As a result of these gender differences in labor demand and supply, changes in macroeconomic structure and policy have differential effects on men's and women's work (Seguino, 2004).

The literature suggests that there are a number of reasons why an increase in interest rates is likely to impact more on women than men. Takhtamanova and Sierminska (2009) offer four main reasons why this is the case, particularly in developed countries. They argue that the cause would include employment segregation, labour market attachment, job tenure and gender discrimination. The interesting question is to what extent these reasons could be valid in the case of Zambia.

On labor market disaggregation, Takhtamanova and Sierminska (2009) argue that more women than men tend to work in a different and narrower range of occupations. In terms of industries, in the US in the 1970s, for example, 28 percent of men were employed in manufacturing and 17 percent in services versus 21 percent and 42 percent respectively of women. In the 1990s, this number changed to 21 percent of men in manufacturing and 25 percent in services versus 11 percent and 47 respectively for women (Francine Blau, Marianne Ferber, and Anne Winkler 1998). This raises the possibility that changes in the interest rate may have unevenly distributed gender employment effects. More men than women are employed in manufacturing and agricultural professions while more women than men tend to concentrate in administrative, public, and service sector occupations. While this argument seems valid for developed countries, to what extent is this true in developing countries?

On labour market attachment, Takhtamanova and Sierminska (2009) argue that a differential sensitivity of men's and women's employment to interest rates can result from gender differences in the division of part-time and full-time work and labor market attachment (resulting from men's and women's different roles in the care economy) and its correlation with occupational segregation. In both Europe and the US, women have a considerably lower presence in full-time work compared to men (see for example, Rebecca Blank, 1998).

A third reason Takhtamanova and Sierminska (2009) argue that monetary policy could exert a differential employment response is the difference between genders in job tenure. Researchers have found that women have shorter tenure (one reason is that they leave work to start families) and consequently may be laid off faster than men (see Alison L. Booth, Marco Francesconi, and Carlos Garcia-Serrano [1999] for the case of the UK).6 As a result, in times of economic downturns women may suffer more in terms of employment. However, workers with substantial tenure also may be disproportionately hurt in terms of employment during economic downturns. Christopher Ruhm (1987) finds that although the inverse relationship between job duration and turnover rates holds in the US, workers with substantial tenure in recently held jobs are more vulnerable during cyclical fluctuations. This effect is strengthened in sectors that are hit particularly hard by recessions. Overall, it is clear

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that there are differences in job tenure between men and women, and that tenure affects employment responses to economic conditions.

Fourth, employer gender discrimination can also result in employment segregation and cause a gendered employment effect resulting from changes in interest rates. Employers may perceive the productivity of men and women differently and prefer to hire one over the other, either in hiring/firing the more productive or hiring/firing the seemingly less productive and offering a lower wage. This type of behavior may not be evident when the economy is operating close to full employment but can certainly be in effect in times of economic downturns (Takhtamanova and Sierminska, 2009).

Table 3 shows that in the case of Zambia between 2008 and 2012, women were more concentrated in service and sales and skilled agriculture forestry and fisheries. The question is to what extent are these types of jobs susceptible to fluctuations due to macroeconomic changes. What is of note is that technical and professional associates have a highly skewed employment towards men rather than women. Ideally, if these jobs are in the formal paid employment segment, it would be rightly argued that this would account for more stable employment for men compared to women. This, however, is only true when looked at from a formal versus informality perspective.

Table 3: Employment Distribution by Profession

Occupation	2012				2014			
	Population	Both	Male	Female	Population	Both	Male	Female
Managers	52,194	100	72.6	27.4	32,274	100	70.9	29.1
Professionals	218,034	100	56.8	43.2	231,073	100	61.6	38.4
Technicians and Associate Professionals	74,332	100	72.5	27.5				
Clerical Support Workers	36,854	100	48.1	51.9	60,879	100	56.7	43.3
Service and Sales Workers	769,737	100	46.6	53.4	333,037	100	42.2	57.8
Skilled Agricultural, Forestry and Fisheries Workers	2,676,600	100	47.2	52.8	3,285,785	100	48	52
Craft and Related Trades Workers	378,840	100	83	17	348,111	100	79.2	20.8
Plant and Machine Operators and Assemblers	147,171	100	96	4				
Elementary Occupations	1,136,605	100	33.8	66.2				
Other	8,754	100	77.6	22.4	303,951	100	63.7	36.3
Not Stated	553	100	0	100	11,736	100	49.7	50.3
Total	5,499,673	100	49.1	50.9	4,606,846	100	51.9	48.1

Source: Labour Force Survey Reports 2012 & 2014

Gender differences in the division of part-time and full-time work and labor market attachment are correlated to occupational segregation (Takhtamanova and Sierminska, 2009). Table 4 reveals that at the national level in Zambia, in 2008 and 2012, more women than men were concentrated in part-time jobs. This is particularly true when one looks at the rural employed where in all years the concentration of part-time jobs among women is

higher. Interestingly, at national level there is a switch from more females in part-time jobs compared to males between 2012 and 2014. In 2014, there is a higher proportion of males in part-time jobs at national level though the difference is marginal. The fact that generally more women are concentrated in temporary and part-time jobs makes these jobs susceptible to upswings and downswings triggered by macroeconomic policy changes. However, the proportion of men in part-time jobs has been increasing over the three survey years. This dynamic contradicts the conclusion that women may be disproportionately affected because they are in part-time jobs.

Table 4: Percentage (unless otherwise stated) of employed Persons on part-time

Residence	Both	Male	Female	Number of Employed Persons
Year of Survey 2008				
All Zambia	68.6	61.8	76	4,606,846
Rural	82.2	78.1	86.1	3,345,547
Urban	32.6	26	42.3	1,261,299
Year of survey 2012				
All Zambia	50.4	45	55.7	5,499,673
Rural	63.6	61.8	65.1	3,394,134
Urban	29.2	19.6	39.3	2,105,539
Year of Survey 2014				
All Zambia	29.1	29.8	28.5	5,859,225
Rural	39.3	41.3	37.4	3,394,221
Urban	15.1	14.5	15.7	2,465,004

Source: Labour Force Survey Reports 2008, 2012 & 2014

Moreover, the evidence on Zambia suggests that there are more women employed in the informal sector compared to the formal sector. For example, the 2012 LFS shows that 91.3 percent of the women were employed in the informal sector compared to males whose proportion stood lower at 77 percent.

Table 5 shows that between 2012 and 2014, there has been an increase in the share of women working in the agriculture sector. The downside is that the majority of these jobs are informal and unpaid family workers who may be affected by economic swings. As already observed, the retail and wholesale sectors are associated with more women compared to men. Another point worth noting is that the professional, scientific and public administration jobs are largely dominated by men. It is these type of jobs that may not be susceptible to swings in the economy.

Table 5: Employment by sector 2012 to 2014

Industry	2014				2012			
	Population	Both	Male	Female	Population	Both	Male	Female
Total	5,859,225	100	48	52	5,499,673	100	49	51
Agriculture, forestry and fishing	2,864,158	100	40	60	2,872,331	100	48	52
Mining and quarrying	82,725	100	91	9	88,251	100	86	14
Manufacturing	223,681	100	69	31	216,660	100	69	31
Electricity, gas, steam and air conditioning	16,175	100	85	15	12,211	100	79	21
Water supply; Sewerage, waste management...	11,283	100	67	33	14,790	100	52	48
Construction	182,806	100	97	3	187,906	100	96	4
Wholesale and retail trade; repair of motor vehicles etc.	692,078	100	45	55	645,571	100	46	54
Transportation and storage	152,052	100	96	4	137,301	100	92	8
Accommodation and food service activities	72,078	100	48	52	62,671	100	46	54
Information and communication	20,322	100	61	39	42,104	100	57	43
Financial and insurance activities	17,342	100	52	48	14,941	100	53	47
Real estate activities	5,154	100	46	54	7,257	100	49	51
Professional, scientific and technical activities	13,856	100	81	19	19,378	100	65	35
Administrative and support service activities	52,631	100	86	14	57,801	100	86	14
Public administration and defense	72,767	100	86	14	60,750	100	78	22
Education	158,617	100	51	49	150,215	100	52	48
Human health and social work activities	63,255	100	48	52	62,180	100	42	58
Art, entertainment and recreation	10,163	100	63	37	10,267	100	73	27
Other service activities	107,310	100	41	59	110,550	100	42	58
Activities of households as employer	1,020,054	100	40	60	722,524	100	20	80
Activities of extraterritorial organizations	3,790	100	83	17	4,016	100	71	29
Not elsewhere classified	16,930	100	43	57	-			

Source: Labour Force Survey Reports 2012 & 2014

The evidence here shows the dynamics in the employment of female and males and how these have evolved over time with differing characteristics. What is not fully established is how monetary policy changes have affected these gender unemployment differentials. Why the theoretical arguments are presented in this section, on changes in monetary policy account of any of these employment dynamics remains an empirical issue that is explored fully in the remaining sections of this paper.

3. Data description and Methodology
3.1. Data Description

The study used LFS conducted by the Zambia Statistics Agency (formally Central Statistics Office)4. Our analysis is informed by the three waves of LFS 2008, LFS 2012 and LFS 2014. Based on these independent surveys, we build a district-level panel dataset which we then use to empirically estimate the monetary policy effect on male versus female unemployment. We compute district based unemployment rates from which we construct unemployment ratios. The use of the district panel is to mitigate the lack of data that would otherwise allow for a time series analysis because labour statistics are collected at irregular intervals and their collection started in the 2000s.

We obtained the figures for the central bank policy rate and the interbank rate from the Bank of Zambia annual report (BoZ, 2015).

3.2. Methodology

To understand the distributional effects of monetary policy on gender, we estimate a panel econometric model following the model developed by Seguino and Heintz (2012). These authors investigate the impacts of contractionary monetary policy on gender and race using federal funds rate, the interest rate on overnight loans between banks, as the indicator of contractionary monetary policy. In this paper, we proxy monetary policy using the Bank of Zambia monetary policy rate and the interbank rate. We use the ratio of female unemployment rate to male unemployment rate as dependent variable. The focus is to observe the impacts of central bank policy rate on the ratio of female unemployment rate to male unemployment rate. We thus estimate the equation as specified below

$$U_{it}^{FM} = \beta_0 + \beta_1 BPR_t + \beta_2 X_{it} + \mu_i + \epsilon_{it}$$

Where U_{it}^{FM} is ratio of female to male unemployment in district i at period t, BPR is the BOZ policy rate or proxy for monetary policy over time. X_{it} is a matrix of other independent variables likely to affect female to male unemployment ratio. We believe that the proportion of women in the population has an effect on the ratio of unemployment rates. We also expect that the size of the agriculture and wholesale and retail sectors has an effect on the dependent variables. The two sectors are among the sectors which traditionally absorb women in the labour market. The full set of covariates include female share of the population, share of population with grade 12 and above, share of agriculture workers, share of workers in retail and wholesale sector. The variable μi captures the district effect and it is the idiosyncratic error term. We opt to use fixed effect panel data analysis to capture the district-specific effects.

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[4] The LFS is a household-based sample survey aimed at collecting data on the labour market activities from eligible individuals. LFS collects data on variables including economic activity, employment, hours of work and under-employment, unemployment/job search, previous work experience and household chores.

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The issue is that there is no panel of employment data. Therefore, we build the panel by calculating the unemployment figures for each of the 74 districts for which we have data for all the study period. It is possible and justifiable to do so as the LFS are not only representative at national and provincial, but also at district level. The fact that after 2011, the number of districts increased, there is effort to pick only the districts that were in existence before and continued thereafter.

4.   Results and Discussion

This section gives the results of the study and also discusses the findings. The section starts by giving summary descriptive statistics of the data that is used in the analysis and then presents and discusses the panel econometric results showing the distribution effect of monetary policy in Zambia focusing on the period 2008 and 2012.

4.1. Summary Statistics

The difficulty comes in establishing whether a period is characterized by expansionary or contractionary fiscal policy. Taking a time series helps establish this fact. Figure 1 shows that from December 2009 to December 2012, The Bank of Zambia reduced the policy rate over this period. After 2012, the policy rate was adjusted upwards. Without any further monetary evidence, we can deduce the period between 2009 and 2012, BOZ was pursuing an expansionary policy. On the contrary, from 2012 to 2015 the Central Bank was pursuing a contractionary monetary policy. Table 6 gives descriptive statistics of both the monetary policy variables and the employment situation in Zambia. For the period 2008 to 2012, the BoZ policy rate stood at 20.8 percent, 9.3 percent and 12.5 percent in 2008, 2012 and 2014, respectively.5 We therefore, characterize the period 2008 to 2012 as the expansionary monetary policy episode and the period 2012 to 2014 as the contractionary monetary policy episode. As an alternative indicator of monetary policy, we also present the interbank rate during the two episodes. The pattern of the interbank rate and the monetary policy rate is similar, which allows us to present results for both scenarios.

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[5] As the policy rate was introduced long after 2008, the measure here is a proxy using the 90-day Treasury bill rate.
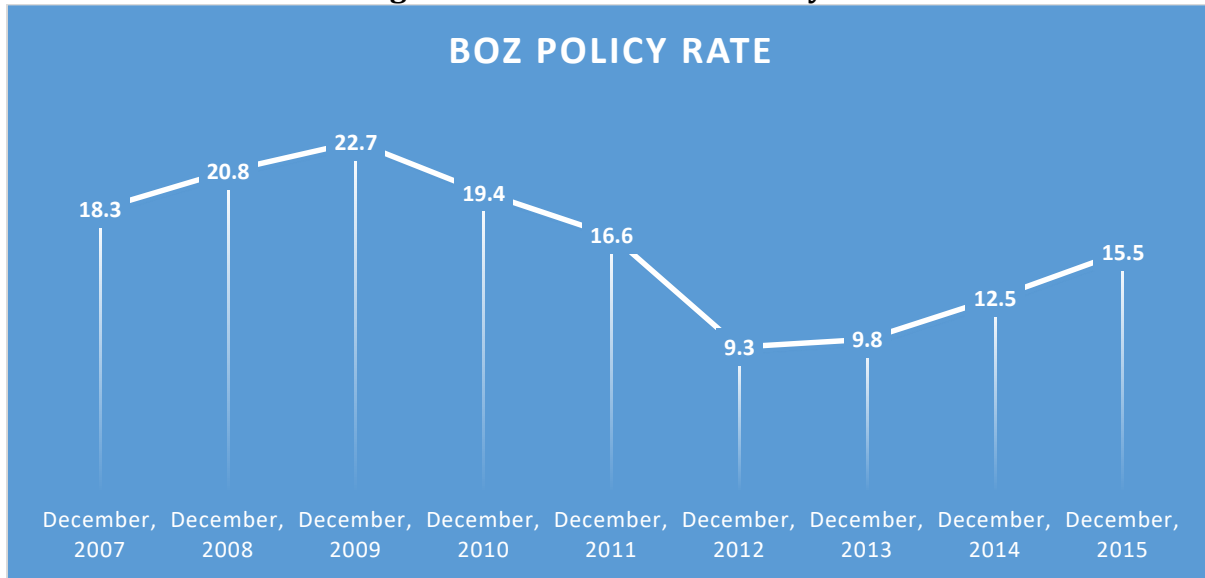
Figure 1: Bank of Zambia Policy Rate

Figure 1: BOZ Policy Rates 2007-2015

All other things equal, contractionary monetary policy is associated with increased unemployment. However, we expect variation in unemployment to be different between males and females. Descriptively, Table 6 reveals that the responses of male and female unemployment levels to changing monetary policy rate were different. Between 2008 and 2012 female unemployment rate declined from 26.9percent to about 8.2 percent while male unemployment dropped from about 28 percent to around 5 percent. Between 2012 and 2014, female unemployment increased marginally from 8.2 percent to about 9.2 percent, an increase of less than 1 percent. Male employment on the other hand increased by almost 2 percent during the same period. Table 6 also describes changes in other variables likely to affect female employment levels.

Table 6: Descriptive statistics

VARIABLES[6]	year 2008				year 2012				year 2014			
	N	mean	min	max	N	mean	min	max	N	mean	min	max
F_unemp_rate	72	26.9	13.8	54.8	74	8.2	0.0	54.6	74	5.2	0.0	18.4
M_unemp_rate	72	27.9	15.6	51.4	74	5.6	0.0	37.5	74	7.5	0.0	27.4
f2m_unameratio	72	1.0	0.7	1.4	64	1.8	0.0	6.5	72	1.1	0.0	7.2
female_sharepop	72	50.6	46.8	56.5	74	50.7	45.7	56.8	74	51.0	45.6	57.6
rural_prop	72	77.6	0.0	100.0	74	74.4	0.0	100.0	74	72.5	0.0	100.0

[6] F_unemp_rate is female unemployment rate, M_unemp_rate is male unemployment rate, f2m_unameratio is the female to male unemployment rate ratio, female_sharepop is the female population share in total population , rural_prop is rural population share in total population, G12above_p is the proportion of female population with a grade 12 certificate of higher in education attainment, agric_share is the share of females employed in the agricultural sector, retailw_share is the share of females employed in the retail sector, bozrate is the Bank of Zambia policy rate and interbank_rate is the inter-bank rate as another proxy for monetary policy and female_pop is the total female population.

VARIABLES[6]	year 2008				year 2012				year 2014			
	N	mean	min	max	N	mean	min	max	N	mean	min	max
G12above_p	72	2.9	0.1	12.3	74	2.7	0.0	14.4	74	3.2	0.0	12.3
agric_share	72	102.9	10.9	156.2	74	69.4	1.1	141.7	74	52.8	26.2	93.4
retailw_share	72	7.4	0.5	32.0	74	9.6	0.7	27.6	74	9.2	0.0	27.3
bozrate	72	20.8	20.8	20.8	74	9.3	9.3	9.3	74	12.5	12.5	12.5
interbank_rate	72	12.8	12.8	12.8	74	8.8	8.8	8.8	74	23.4	23.4	23.4
female_pop	72	2,562	2,193	3,189	74	2,573	2,085	3,230	74	2,605	2,074	3,322

Source: Author's Calculation Based on LFS 2005, LFS2012 and LFS 2014

We see that the share of employment for both agriculture as well as the retail and wholesale sectors decreasing between 2012 and 2014. Considering that the two sectors are among the traditional sectors employing a larger share of women, a reduction in the share of employment for these two sectors has got potential to negatively impact women employment. Another variable likely to affect women employment is the actual share of the women in the population (female_sharepop), which remained fairly stable around 50 percent across the three years. Other factors include the proportion of the population resident in rural areas (rural_prop) and the share of the population with a grade twelve certificate (female_sharepop2) or better which increased slightly during the contractionary monetary policy episode.

4.2. The distributional effects of contractionary monetary policy

Table 7 gives the results of the estimated regression model of male to female unemployment ratio on the central bank monetary policy rate and other covariates. To understand the effect of monetary policy on male relative to female unemployment, we focus on the estimated coefficient of the central bank monetary policy rate. The model is estimated for the period 2012 to 2014. The model is labelled full sample to include all workers regardless of their type of employment. This means it includes paid workers, self-employed workers and un-paid family workers.

The estimated results reveal a negative relationship between female to male unemployment ratio and the Bo Z policy rate, implying that an increase in BoZ policy rate increases male unemployment more compared to the increase in female unemployment. In column 6 of the table, a 1 percent increase in the policy rate reduces the female-male unemployment ratio by 0.16. As already indicated, the impact of contractionary monetary policy (increasing policy rate), reduces the ratio implying that it is the male unemployment rate that increases more than the increase in the female unemployment rate.

This finding is contrary to most studies that find results in the opposite direction (Seguino and Heintz, 2012; Braunstein and Heintz, 2008). These studies find that in the majority of times contractionary monetary policy increases female unemployment more than male unemployment. However, there are other studies that find contrary results. For example, Braunstein and Heintz (2008) found that only in 67 percent of their results did

contractionary monetary policy lead to increased unemployment for women compared to men. The remainder of their results found that there are instances where monetary policy tightening increased unemployment for men more to women unemployment. Other results that are similar to what we find include Ewing, Levernier and Malik (2002) who using a different method of generalized impulse response, found that while real output growth in the US reduced the unemployment rate of all demographic groups, the effect was larger and more persistent for blacks than whites and for males than females, and Abell (1991) finds similar results. These studies, though using different methodologies, have results which conform to what we find.

Table 7: Policy rate impact on female-male unemployment ratio for all employees including unpaid family workers

	[1]	[2]	[3]	[4]	[5]
IV	f2m_ur	f2m_ur	f2m_ur	f2m_ur	f2m_ur
boz rate	-0.202***	-0.202***	-0.152**	-0.159**	-0.160**
	(0.066)	(0.066)	(0.074)	(0.074)	(0.075)
female pop_share		1.043	0.661	0.864	0.934
		(1.998)	(2.013)	(2.01)	(2.047)
female pop_share2		-0.009	-0.006	-0.008	-0.008
		(0.0194)	(0.0196)	(0.0196)	(0.0199)
agric_share			0.008	0.006	0.005
			(0.006)	(0.007)	(0.007)
retail&w_share			0.0425*	0.0555**	0.0582*
			(0.0258	(0.0273)	(0.0307)
pop share_G12_ higher				-0.083	-0.072
				(0.059)	(0.079)
rural pop_share					0.002
					(0.009)
Constant	3.635***	-23.53	-15.46	-20.22	-22.15
	(0.744)	(51.29)	(51.63)	(51.55)	(52.61)
Observations	136	136	136	136	136
Number of dist	74	74	74	74	74

Source: Author's Calculation Based on BOZ (2016) and Labour Force Survey data

To incorporate the importance of education, we included the share of workers with grade 12 qualification and above and the share of those working in the services sector which includes

retail, wholesale and construction sectors. While the effect of the share of the proportion with grade 12 qualification is positive, it is statistically not significant (Model 4 and 5). What we find significant is the share of women working in the retail/wholesale sector (Model 3, 4 and 5). We find that the effect is positive. However, care has to be taken in interpreting this result because we are essentially looking at two ratios. The best way to understand what exactly is happening is to look at the descriptive data in table 6 above. What we find is that the share of females in retail and wholesale sector decreased on average from 9.6 percent in 2012 to 9.2 percent in 2014. On the other hand, the female unemployment rate decreased from 8.2 percent in 2012 on average to 5.2 in 2014 while the male unemployment rate increased from 5.6 percent to 7.5 percent. Given this descriptive data we can interpret to retail and wholesale share of female employment as meaning that an increase in the employment of females in the retail sector leads to a reduction in the female unemployment rate but what happens to the male unemployment rate is ambiguous as it male increase, remain the same or decrease. In the case of the data the male unemployment rate increased suggesting that the increase in female share in employment in retail and wholesale sector is due to 'displacement of males' in the sector or reflects what is happening elsewhere in the economy. An increase in the share of females working in the retail and wholesale sector affects the female-male unemployment ratio by increasing it.

Since BoZ only introduced the policy rate in April 2012 as the main instrument of monetary policy implementation, we also used the interbank rate as a robustness check for the results. The results are shown in appendix A and reveal the same result that contractionary monetary policy affects men more adversely in terms of resulting unemployment.

Further, sensitivity analysis was done with regard to looking at selected types of workers. The first of these was to run the same model but only treating paid employees as the employed while the rest are considered as unemployed. This excludes unpaid family workers and self-employed workers. Table 8 shows the regression results for paid employees. Although the results remain essentially similar, it is worth noting that the effect of the increase in the policy rate on female to male unemployment rate is larger, but with the same negative coefficient. Thus, for paid employees only, an increase of the policy rate by 1 percent leads to a reduction in the female-to-male unemployment ratio by 0.345. The effect is higher than for all employees and this is expected that those who are wage-employees are likely to be affected more by macroeconomic shocks as firms and agents adjust to the shock. This implies that for paid employees, the unemployment of women increases far less in comparison to the increase in the unemployment rate of men. The higher effect is due to This result implies that the unemployment rate of paid men compared to paid women is more sensitive to increases in the policy rate as opposed to all the employed.

Table 8: Policy rate impact on female-male unemployment ratio using sample of paid employees

	[1]	[2]	[3]	[4]	[5]	[6]
IV	f2m_ur	f2m_ur	f2m_ur	f2m_ur	f2m_ur	f2m_ur
boz rate	-0.418***	-0.413***	-0.325**	-0.325**	-0.333**	-0.345***
	(0.117)	(0.116)	(0.129)	(0.129)	(0.13)	-0.13)
female pop_share		0.775	0.732	0.732	0.856	0.759
		(1.17)	(1.156)	(1.156)	(1.164)	(1.18)
female pop_share2		-0.009	-0.0087	-0.008	-0.01	-0.008
		(0.012)	(0.012)	(0.012)	(0.012)	(0.0122)
agric_share			0.006	0.006	0.002	0.004
			(0.0112)	(0.0112)	(0.0125)	(0.0129)
retail&w_share			0.0564**	0.0564**	0.0560**	0.0503*
			(0.0264)	(0.0264)	(0.0265)	(0.0271)
pop share_G12_ higher					-0.0782	-0.125
					(0.085)	(0.112)
rural pop_share						-0.0076
						(0.011)
Constant	6.828***	-8.946	-9.596	-9.596	-12.17	-9.15
	(1.306)	(27.97)	(27.66)	(27.66)	(27.8)	(28.32)
Observations	134	134	134	134	134	134
Number of dist	73	73	73	73	73	73

Source: Authors Estimations

In further sensitivity analysis, we defined the employed as those in paid employment or self-employment. This analysis shows that the basic result remains essentially the same as in the case when we only considered paid employees. The share of the proportion of workers in the retail and wholesale sector has a positive and significant effect on the ratio of female to male employment. See appendix B for these results.

5.   Conclusion

This paper sought to investigate the effect of contractionary monetary policy on the unemployment of women relative to men. The limited empirical literature available

supports the notion that increased short-term interest rates (contractionary monetary policy) lead to increased unemployment of women more than the increase in the unemployment of males. Labour market dynamics suggest that more women than men are employed on a part-time basis, making women more vulnerable to negative aggregate demand shocks. With this, we hypothesized that an increase in interest rates would create higher unemployment rates among women compared to men. However, using panel data, the results reveals that a rise in interest rates between 2012 and 2014, increased unemployment more for men compared to women.

After conducting sensitivity analysis, we conclude that an increase in unemployment rates is higher for males than females due to contractionary monetary policy. Since this analysis is based on a two-time data point and the analysis is based on a partial equilibrium analysis, it would be nice that further work on this subject uses computable general equilibrium analysis in order to fully understand economy-wide effects of monetary policy on gender and unemployment

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Appendix

A: Re-estimated model using the Interbank rate to estimate Monetary policy

	[1]	[2]	[3]	[4]	[5]	[6]
IV	f2m_ur	f2m_ur	f2m_ur	f2m_ur	f2m_ur	f2m_ur
interbank_rate	-0.0443***	-0.0444***	-0.0334**	-0.0334**	-0.0348**	-0.0350**
	(0.0145)	(0.0146)	(0.0164)	(0.0164)	(-0.0164)	(0.0164)
female pop_share		1.043	0.661	0.661	0.864	0.934
		(1.998)	(2.013)	(2.013)	(2.016)	(2.047)
female_sharepop2		-0.009	-0.006	-0.006	-0.008	-0.008
		(0.0194)	(0.0196)	(0.0196)	(0.0196)	(0.0199)
agric_share			0.008	0.008	0.005	0.005
			(0.007	(0.007)	(0.007)	(0.0073)
retail & w_share			0.042*	0.0425*	0.0555**	0.0582*
			(0.0258	(0.0258)	(0.0273)	(0.0307)
pop share_G12_ higher					-0.083	-0.072
					(0.059)	(0.079)
rural pop_share						0.002
						(0.009)
Constant	2.144***	-25.02	-16.59	-16.59	-21.39	-23.33
	(0.281)	(51.28)	(51.63)	(51.63)	(51.55)	(52.62)
Observations	136	136	136	136	136	136
Number of dist	74	74	74	74	74	74

B: Policy Rate impact on Female-Male Unemployment Ratio using sample of all paid and self-employed

	[1]	[2]	[3]	[4]	[5]	[6]
IV	f2m_ur	f2m_ur	f2m_ur	f2m_ur	f2m_ur	f2m_ur
boz rate	0.143*	0.0302	-0.0175	-0.0175	-0.0552	-0.0497
	(0.0851)	(0.12)	(0.137)	(0.137)	(0.153)	(0.16)
female pop_share		-0.499	-0.54	-0.54	-0.466	-0.476
		(0.78)	(0.786)	(0.786)	(0.799)	(0.798)
female pop_share2		0.004	0.004	0.004	0.003	0.004
		(0.0076)	(0.0076)	(0.0076)	(0.0078)	(0.007)
agric_share			-0.002	-0.002	-0.004	-0.004
			(0.0052)	(0.0052)	(0.0067)	(0.0076)
retail&w_share			0.0124	0.0124	0.0173	0.015
			(.0251)	(0.0251)	(0.0267)	(0.0303)
pop share_G12_ higher					-0.0424	-0.047
					(0.076)	(0.095)
rural pop_share						-0.001
						(0.009)
Constant	-0.163	15.36	16.86	16.86	15.62	15.89
	(0.951)	(20.17)	(20.41)	(20.41)	(20.57)	(20.53)
Observations	136	136	136	136	136	136
Number of dist	74	74	74	74	74	74

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Bank *of* Zambia

REGISTERED OFFICES

Head Office
Bank of Zambia, Bank Square, Cairo Road
P.O. Box 30080, Lusaka, 10101, Zambia
Tel: +260 211 399 300
E-mail: info@boz.zm, Website: www.boz.zm

Regional Office
Bank of Zambia, Buteko Avenue,
P.O. Box 71511, Ndola, Zambia
Tel: +260 212 399 600
E-mail: info@boz.zm, Website: www.boz.zm