THREE ESSAYS ON GENDER-SPECIFIC EMPLOYMENT OUTCOMES OF MACROECONOMIC POLICIES

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A Dissertation Presented

by

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ABSTRACT

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This three-essay dissertation examines the impact of fiscal and monetary policies on gender-disaggregated employment outcomes both theoretically and empirically. The first essay constructs a structuralist macroeconomic model that explores channels whereby fiscal and monetary policies impact women's paid and unpaid work. The essay discusses two factors related to labor market segregation that can explain differential effects of macroeconomic policies on male and female employment: the labor intensity of female-dominated sectors, and different responses of capacity

utilization to aggregate demand shocks in male and female-dominated sectors. In addition, a decline in output resulting from aggregate demand shocks may increase women's unpaid work burden when households cannot afford to buy substitutes for the output of unpaid care work. This can also create a labor supply constraint for female employment. The second essay examines the dynamic impacts of fiscal consolidation on the ratio of female employment rates to male employment rates using a dataset for 17 OECD countries over the period 1978-2009. Using a local projections method, this essay shows that fiscal consolidation has a disproportionate impact on female employment rates 3-6 years after the policy change. The impact is driven by the effect of spending-based fiscal consolidation on female employment rates. The results are robust after controlling for the female labor force participation rate, the sectoral structure of the economy, and female employment shares in different economic activities. In the third essay, I examine the dynamic effects of inflation-reduction policies on female and male employment rates in 23 OECD-European countries over the period 1998-2018 using quarterly panel data. The findings suggest that an increase in short-term interest rates, as a proxy for the monetary policy rate, leads to a decline in both female and male employment rates but does not show any significant gender effect on the ratio of employment rates. When controlling for female employment shares by broad areas of activity, an increase in short-term interest rates affects female employment rates disproportionately at the end of an eight-quarter period.

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INTRODUCTION

This three-essay dissertation focuses on the gender-specific employment outcomes of macroeconomic policies. The first essay provides a theoretical model that sheds light on the various channels through which macroeconomic policies differentially impact employment outcomes for women and men, while the second and third essays present an empirical analysis of the impact of fiscal and monetary policies on women's and men's employment. Although fiscal policy and monetary policy are implemented concurrently, their tools and mechanisms are different, and they can lead to different gender implications on employment. I therefore explore fiscal and monetary policies in separate essays.

Macroeconomic policies, specifically fiscal and monetary policies, affect various areas of the economy, including labor market outcomes and non-market work. The consequences of these policies often are not the same for women and men. Specifically, differences can arise in both paid work and non-market work through channels affecting labor demand and supply. These include labor market segregation, the gender division of labor, and various labor supply dynamics. With regard to paid employment, women and men are concentrated in different sectors and occupations. Men do more paid work, while non-market work is mostly done by women.

The first essay builds a gender-aware macroeconomic model to analyze the impact of fiscal and monetary policies on gender-disaggregated employment outcomes. The

model considers both paid and unpaid work of women to incorporate gender aspects into a structuralist macroeconomic model. There are two mechanisms that explain different effects of macroeconomic policies on female and male employment rates; the labor intensity of a female-dominated sector, and different capacity utilization responses to aggregate demand shocks in female and male-dominated sectors. In addition, women's unpaid work burden may rise as a response to contractionary policies because the household cannot buy substitutes for the output of unpaid care work, which has a potential to create a labor supply shortage for female employment.

In the second essay, I examine the dynamic impact of fiscal consolidation on gender disaggregated employment rates in 17 OECD countries over the period 1978-2009 with a dataset that identifies discretionary fiscal consolidation. Findings suggest that discretionary fiscal consolidation, motivated by the goal of reducing budget deficits, has a disproportionate impact on female employment, which is stronger between 3-6 years after fiscal consolidation. The impact is higher when the fiscal consolidation is spending-based, rather than tax-based. The results are robust to inclusion of specific control variables: female labor force participation rate, sectoral structure of the country, and female employment shares in different economic activities.

In the third essay, I explore the dynamic effects of inflation reduction policies on female and male employment rates, as well as their ratio for 23 OECD-European countries. I use two empirical strategies. First, I look at the impact of short-term interest rates as a proxy of monetary policy interest rate. Second, I examine employment changes during inflation reduction episodes. The results show that short-term interest rates have negative impacts on female and male employment rates; how-

ever, the difference between the effects are not statistically significant. If female employment shares by broadly defined economic activities are kept constant, short-term interest rates affect female employment rates more than male employment rates eight quarters after the policy change.

CHAPTER 1

A STRUCTURALIST MACROECONOMIC MODEL ABOUT GENDER IMPLICATIONS OF MACROECONOMIC POLICIES

1.1 Introduction

This essay presents a theoretical model that explores the impact of monetary and fiscal policies on gender disaggregated employment outcomes. While there exists an empirical literature on the gendered impact of macroeconomic policies (Abell, 1991; Braunstein and Heintz, 2006; Takhtamanova and Sierminska, 2009; Seguino and Heintz, 2010; Ortiz and Cummins, 2013; Braunstein and Seguino, 2018), I analyze this research question with a gender disaggregated macroeconomic model. The theoretical model sheds light on the various mechanisms and channels whereby macroeconomic policies have distinct employment outcomes for women and men. The modeling exercise shows how these outcomes depend on structural features of the economy and would generate a number of testable hypotheses. Even though it is an important part of gender analysis, few scholars have analyzed care work in a macroeconomic model, exceptions include Braunstein et al. (2011). It is essential to include care activities in a structuralist macro model to consider implications of both fiscal and monetary policies on female employment.

The main objective of this paper is to show how and by which mechanisms monetary and fiscal policies can affect employment outcomes for women disproportionately using macroeconomic modeling. This paper focuses on two factors that yield differential impacts of fiscal and monetary policies on female and male employment rates: labor intensity of the female-dominated sector and different capacity utilization rates in female and male sectors. In addition, macroeconomic policies also have an effect on the unpaid work time of women. When aggregate demand shocks squeeze household budget, women do more unpaid work because they cannot afford to buy substitutes of unpaid work. This has the potential to create a labor supply constraint for female employment.

I use the model developed in this essay to motivate my other research projects which analyze the impact of macroeconomic policies on gender disaggregated employment empirically. The plan for the rest of the paper is as follows. In Section 2, I present the related literature review. I combine the literature on structuralist macroeconomics and feminist economics. I also discuss research questions, my hypothesis and the specific contributions of this paper. In Section 3, I construct a gender-disaggregated structuralist macroeconomic model. In Section 4, I show the effect of an aggregate demand shock on female and male employment rates. Finally, Section 5 concludes.

1.2 Literature Review and Conceptual Framework

In this essay, I develop a model that analyzes the effects of fiscal and monetary policies on gender specific employment rates by using a gender-aware macroeconomic

model. In addition to including gender disaggregated variables to macroeconomic models, a gender-aware approach also addresses gender dynamics in both market and non-market work by using macroeconomic tools. Before discussing the literature on the specific topic, I present an overview of the literature on gender-aware macroeconomic models. The inclusion of gender in macroeconomic models is still evolving. The literature can be classified into two broad categories: studies that mention the importance of gender-macro modeling, and those which include gender in macroeconomic models. There is a significant body of work examining the first issue, but studies addressing the second issue are still limited. Examples of gender-macro modeling literature are Cagatay et al. (1995); Elson (1995a); Beneria (1995); Fontana (2014); Cozzi and Bargawi (2015).

The literature discusses why a gender-aware macro modeling approach is useful to address problems in gender and macroeconomics field. Articles in the 1995 special issue of *World Development* (volume 23, issue 11) discusses gender aware macroeconomic analysis in details. Cagatay et al. (1995) discuss three important aspects of macroeconomic models with regard to feminist economics. First, models are helpful to interpret the direction and size of an effect. Second, they are a good way to communicate with mainstream economists. Finally, they have significant implications for policy making. Cagatay et al. (1995) discuss four approaches to gender-aware macroeconomic modeling: the gender disaggregation model, the gendered macroeconomic variable method, the two sector/system method, and the combined method. Elson (1995a, 1851-1852) discusses three strategies for gender-aware models; disaggregating at least a variable in terms of gender, identifying the economy from women's

viewpoint, and conceptualizing a gender structured economy. Beneria (1995) stresses the importance of building a model from a gender perspective, and discusses some suggestions for such an approach, including hidden costs that are ignored in most macroeconomic models. These approaches to developing a macroeconomic model from a gender perspective can identify both short term and long term social policy measures to decrease the negative effects of economic policies, such as structural adjustment or austerity policies. Ideally, macro models should link paid and unpaid work, and productive and reproductive activities. This approach should be aware that technological change maybe gender biased. It should also consider that feminist concerns and macroeconomic objectives interact (Beneria, 1995, 1846-1848).

There are different ways to adopt a gender-aware approach to macro-modeling. Fontana (2014) stresses the importance of generating gender awareness in the field of macro-modeling, and discusses two main approaches in CGGE (computable gender general equilibrium models): GD approach (the 'gender disaggregation school') and 2S approach (the 'two systems' school). GD approach focuses on the differences between men and women in the labor market while 2S approach also addresses unpaid reproductive activities. Fontana (2014) considers 2S models to be superior to GD models in terms of a feminist policy agenda because they take unpaid work into account, and stress the unequal burden of it on women. That being said, 2S models also have limitations: 'the absence of a mechanism for representing the complete range of feedback effects between the market and the non-market sphere' (Fontana, 2014, p. 168). Fontana (2014, p. 174) concludes that further research should stress

distinguishing different types of unpaid care activities, and the interconnection of care activities with the market sphere.

In my research, I focus on short-run macroeconomic relationships while longer term gender analysis is also available in the macro-modeling literature. Cozzi and Bargawi (2015) make a contribution using The Cambridge-Alphametrics Model, which provides a medium- to long-term perspective. They focus on two alternative scenarios: an austerity scenario and a gendered expansionary macroeconomic scenario. They make this comparison in Core Eurozone countries (Austria, Germany, Belgium, France, Luxemburg and The Netherlands), Eurozone Periphery countries (Italy, Ireland, Spain, Portugal and Greece), and the United Kingdom. They conclude that if gender-sensitive expansionary macroeconomic policies -instead of austerity policies - are applied, both economic growth and male and female employment increase. These policies would also reduce the employment gender wage gap between women and men.

I contribute to this literature by focusing on the gender aspect of the short run structuralist macroeconomic model. The structuralist macroeconomic approach has its foundation in non-mainstream economics such as Keynesian, Kaleckian, Ricardian, and Marxian traditions. The main idea is that social groups as well as distributional and institutional relationhips play important roles for macro behavior. Therefore, these approaches focus on institutions such as households, and government more than individual agents (Taylor, 2004, p.1-2). Structuralist macroeconomic models; such as in Dutt (1984); Taylor (1990); Marglin and Bhaduri (1992), consider the role of income distribution to explain macroeconomic outcomes. Taylor (1990)

states that wage-cutting may respond counterproductively to the policy questions, regarding the effects on inflation and output, in developing countries. He examines semi-industrialized stylized facts and institutions to decide which casual relations on simple macroeconomic models fit the best. In his 'closed-economy macroeconomic relationships' model, Taylor (1990) starts with Kalecki's (1971) model of output adjustment in an economy closed to trade, then continue with the extension of Rowthorn (1982) and Dutt (1984) to show the impact of the real wage on output, the profit rate and growth.

As mentioned in Akram-Lodhi and Hanmer (2008), structuralist and Post Keynesian macroeconomic models are useful in several ways when extending the model to incorporate gender dynamics. First, it is possible to incorporate heterogenous variables into the model. This makes it possible to include gender disaggregated sectors, labor, and wages etc. Second, it allows models to have different domains; market and state or as in Akram-Lodhi and Hanmer (2008) a household sector. Finally, structuralist and post Keynesian economics are concerned about the issues of economic growth and distributional relationships. In the gender-aware macroeconomic model case, we can analyze the different distributional outcomes for female and male workers in addition to the distributional relationship between capitalists and workers.

There are some attempts in the literature to use a structuralist macro model that includes gender relations; Erturk and Cagatay (1995); Braunstein (2000); Blecker and Seguino (2002); Seguino (2010); Braunstein et al. (2011); Akram-Lodhi and Hanmer (2008). These papers explain macroeconomic research questions by drawing attention

to differences between men and women in the labor market and within households. I also analyze a macroeconomic question in a similar setting with gender disaggregated variables, and considering gender inequality in the labor market and household production. Erturk and Cagatay (1995) research the macroeconomic implications of two outcomes of structural adjustment policies; the feminization of the labor force in the market sphere, and the intensification of female labor use in the reproductive sector. They analyze this question by building a dynamic Keynesian model. Their results show that more developed countries are more likely to experience recovery through feminization.

Women's bargaining power at home affects macroeconomic outcomes for women in the labor market. Braunstein (2000) develops a model that includes both a family structure and structural macroeconomic relations. She examines how international capital mobility affects female wages and employment. The results show that in case of low capital mobility, a rise in women's bargaining power relative to capital improves macroeconomic outcomes and women's wage and employment. In the high capital mobility situation, this improvement in women's bargaining power relative to capital may decrease output. However, a rise in female autonomy from men can increase output.

Gender disaggregated variables in a macroeconomic model are useful to identify distinct effects on labor market outcomes for women and men. Blecker and Seguino (2002) provide two short run structuralist models. There are two sectors, producing home and export products, and the export sector is female-intensive. In the first model, wages are exogenous, and the exchange rate is constant. In the second model,

the female-male wage ratio and the real exchange rate are endogenous. They discuss the conditions that can improve gender equality for female workers in export sector without threatening growth and employment. In the first model, an exogenous increase in female wages do not reduce employment; on the other hand, it may even increase the employment in some circumstances (in cases of 'a relatively low price elasticity of exports; a high elasticity of price cost margins with respect to international competitive pressures in the export sector; a wide gap between the marginal propensities to consume out of wage and profit income; and relatively large domestic consumption of the export good' (Blecker and Seguino, 2002, 116)). In the second model, different short run dynamic outcomes are possible.

Gender equality might affect outcomes of macroeconomic changes. Seguino (2010) examines the impact of gender equality on the balance of payments constraint to growth in semi-industrialized countries and low-income agricultural economies in both the short and the long run. The results show that, in the short run, gender equality worsens the balance of payment in semi-industrialized countries, and enhances it in low-income agricultural economies. In the long run, government action is required to improve both equality and growth.

Having gender disaggregated two sectors in the model makes it easier to interpret the differences between female-dominated and male-dominated sectors. Akram-Lodhi and Hanmer (2008) integrate gender relations into a Post Keynesian two-sector macroeconomic model to examine the dynamic relationship between household production and commodity production. They use structuralist and Post Keynesian methodology by taking household domain into account. Their analysis show that

investment in household production is essential to improve standard of living, which supports the argument of the importance of unpaid care work for economic development.

Gender equality in performing unpaid work might affect market activities in gender disaggregated sectors. Braunstein et al. (2011) incorporate gender into a structuralist macroeconomic model considering both paid and unpaid work. They compare care work and labor market relationships in a 'selfish' and 'altruistic' economy. Their main contribution is to add care work into a structuralist macroeconomic model. In this model, both men and women are involved in both paid and unpaid work (with a larger extent of women performing unpaid care). They follow Marglin and Bhaduri's (1990) demand-side structuralist model. They consider three different spheres in the supply side: the labor market, the product market, and the production of human capacities in the household sector. There is a 'female sector' and a 'male sector' in the model. Women work in the service sector which produces substitutes for unpaid care. Men work in a durable goods industry which produces physical investment goods which complement care work. In the model, altruistic economies have a lower profit share but higher output. Their results show that more gender equality leads to more efficiency gains with regard to market activities in an altruistic economy, which is not the case in a selfish economy.

Non-market production should be considered as well as market dynamics to examine gender aspects of macroeconomic relationships. Folbre and Heintz (2017) focuses on the integration of family and market dynamics in macroeconomic models. They compare accounting framework, neoclassical growth models that assumes joint

utility and overlapping generation models. Their investigation of accounting models provides a useful framework for incorporating non-market work. Non-market output of household services is not counted in GDP; however, efforts to assign a monetary value to unpaid, non-market production find that such activities represent a value equal to a significant percentage of GDP (Folbre and Heintz, 2017, p.115). This suggests that some forms of non-market production, supported by transfers from households and the state should be counted as investment (Folbre and Heintz, 2017, p.116).

According to the extended social accounting matrix that Folbre and Heintz (2017) elaborate, we can think of two types of household activities; household market activities and household non-market activities. In this social accounting model, there are transfers from firms to household market activities (W_m) and government (T_f); from household market activities to firms (C_m), household non-market activities (C_h), government (T_m), and net investment (S_{hm}); from household non-market activities to household market activities (W_h) and net investment (S_{hh}); from government to firms (G_f), household market activities (G_h), and net investment (S_g); from net investment to firms (I_f), household market activities(I_m), and household non-market activities(I_h) (Folbre and Heintz, 2017, p.117). Although the model developed in this essay could incorporate these relationships, for simplicity and to focus only on the policy questions, the full range of these kinds of transfers are not included in this model. Instead, I selectively consider some of these transfers.

A gender disaggregated macro model should ideally incorporate both market work and non-market work. Women contribute to non-market household activities more

than men because they are the main providers of care. As a simplifying assumption, within the model presented here, all of the output produced by the unpaid sector represents investments in human capital. I adapt the approach of Folbre and Heintz (2017) in terms of considering transfers from household non-market activities to household market activities as well as transfers from household market activities to household non-market activities.

Macroeconomic policy shocks affect female paid and unpaid work through several mechanisms representing both demand and supply sides. Within my model, the three channels that explain the disproportionate negative impact on women's work are labor market segregation, gender division of labor, and labor supply dynamics. Labor market segregation and occupational segregation usually put women in either public sector, service sector or more precarious forms of employment. Aggregate demand shocks might affect some sectors more than others. In some cases, these can be male-dominated sectors such as construction; in other cases, these can be female-dominated sectors such as service sector or public sector. Although it is not specifically modeled here, cuts in government spendings can affect women more since they heavily work in public sector.

In addition to the difference between women and men in the labor market, unpaid work constitutes a significant source of gender inequality that affect the distributive consequences of macroeconomic policies. With the gender division of labor, women are concentrated in unpaid work while men are concentrated in paid employment. Women may act as a reserve army with regard to supplying labor to the market econ-

omy. A fuller consideration of gender in a macroeconomic model should incorporate these dynamics of unpaid work.

Through labor market dynamics, macroeconomic policies that squeeze household resources can affect women's labor supply and paid employment. There are two possible outcomes. It may increase paid employment of women if women enter the labor force to compensate for lost market income or it may decrease paid employment of women if women withdraw to focus on unpaid household work. In this model, I will try to show which one of those channels influence the size and direction of changes in the allocation of women's labor.

Using the model developed here, this essay attempts to explore a number of questions. Do contractionary fiscal and monetary policies have different employment outcomes for women and men? How does male and female employment react to a change in output differently? How does the change in unpaid work contribute to this? How is unpaid work affected from the policy change? The model's outcomes suggest that the same level of decrease in output across sectors will lead to higher employment loss in female sector because female sector is more labor intensive; that different responses of capacity utilization to shifts in aggregate demand can explain disproportionate gender employment effects; and that a decline in market output as a result aggregate demand shocks can increase the unpaid work time for women when households cannot afford paid care services. Spending more time in unpaid work could have an indirect effect on paid work if it results in insufficient labor supply to the market economy.

1.3 A Gender Aware Structuralist Macroeconomic Model

I build the model on previous structuralist macroeconomic models in the literature (Taylor, 1990; Braunstein et al., 2011; Dutt, 1984). The model considers the closed economy macroeconomic relationships with gender disaggregated output, wage and employment rates. There are two sectors in the market economy; a female intensive sector, and male intensive sector. Capital, market output, and paid labor are divided between sectors. For simplicity, female intensive sector only employs women, and male intensive sector only employs men. Because it is a short run model, capital is not mobile between sectors, and technology is fixed. The female sector's output and the male sector's output (Y_f, Y_m) represent the output of paid employment. I assume that the female intensive sector is more labor intensive. In addition, women supply labor to unpaid care activities in the household.

In the model, women do all unpaid work to draw attention to women's burden of unpaid work, and how this burden can have a role in the impact of macroeconomic policies [1]. The amount of unpaid work that men and women do can change in different country contexts but the literature provides evidence that women contributes to household work and care work more than men (Galvez-Munoz et al., 2011; Sevilla-Sanz et al., 2010; Kizilirmak and Memis, 2009; Hartmann et al., 2010; Berik and Kongar, 2011, 2012). While there is a significant gender gap in time spent for unpaid work, this gap may narrow at times for example during recessions. However, even in these cases the decline in the gap is not very large, and on average women still

[1] It is also possible to extend the model in a way that includes men's unpaid work. However, for the purpose of this study, men's unpaid work is not included.

do larger part of unpaid work. In these cases, the time that men spend on unpaid work does not necessarily increase significantly. For example, the decline in the gender gap was driven by the decline in women's unpaid work in the US during the Great Recession, and during the post-recession period it returned to its pre-recession patterns (Kongar and Berik, 2014; Berik and Kongar, 2012, 2011). Even though men are expected to do more unpaid work when they are unemployed, the increase in their time spent in unpaid work is still less than women in most cases. The literature on different county examples provides similar results. Individual unemployment increases women's unpaid work a lot more than men's unpaid work, and both employed and unemployed women do more unpaid work than their male counterparts in the US (Hartmann et al., 2010; Berik and Kongar, 2011). Women's paid work has a very little effect on men's unpaid work in Spain (Carrasco and Dominguez, 2011).

Equation 1.1 shows the labor output relationship in the male sector where b is the labor output ratio in this sector, L_m is male employment, and Y_m represents market output of this sector. Labor in male sector and output in male sector are positively correlated so when output increases labor is also increasing. The female dominated sector is more labor intensive so the labor-output ratio, c, is higher than the labor-output ratio in the male sector, b. The relationship between female paid employment, L_F, the productivity parameter c, and market output of this sector, Y_f, is presented in Equation 1.2. Since female market output is less than male output, female employment is lower than male employment. Therefore even though c is higher than b, female employment still falls below male's. Because of differences in labor intensity, female labor is more responsive to changes in output in the female

sector than male labor responsiveness to output in the male sector.

$$L_m = bY_m \tag{1.1}$$

$$L_f = cY_f \tag{1.2}$$

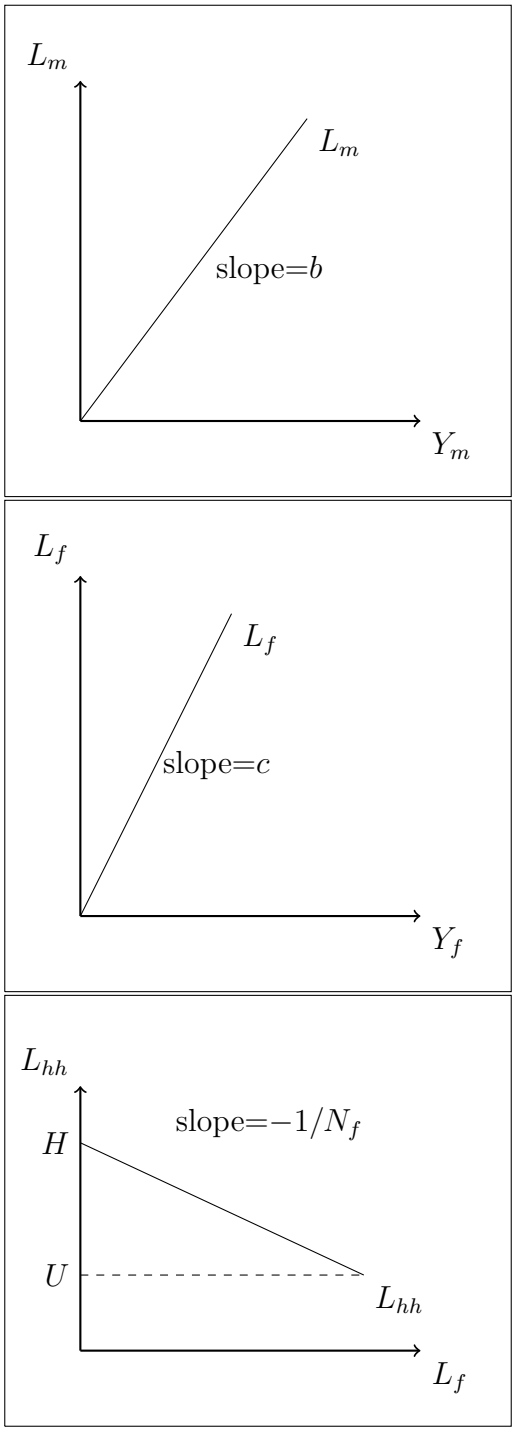
This model considers a household with a female and a male member to show the gender differences in employment and unpaid work. Women in all household perform the same amount of care work. For simplicity, this model does not consider different types of care work, and only women do unpaid care work[2]. Women divide their time between paid and unpaid work. Women's unpaid work decreases with income. After sleep and personal care, the maximum hours that can be devoted to (unpaid) work is given by the variable H. However, even if women have a full-time job, they still do a minimum amount of household work. U is the minimum amount of unpaid work that the households needs. As demand for women's paid work increases, unpaid work falls - although there is a lower bound below which it cannot fall further. The following equation explains the time spent for unpaid work.

$$UWT = max\{U, H - L_f/N_f\} \tag{1.3}$$

[2]'Unpaid work' and 'unpaid care work' are not necessarily the same. Unpaid work might include other types of work in addition to unpaid care work. However, I will use them interchangeably throughout the text.

where UWT shows unpaid work time, and U is a baseline level that women's unpaid work could not fall below. In Equation 1.3, H is equal to 24 minus required personal care time for women in a daily analysis. Women can divide $H - U$ hours for either paid or unpaid work. L_f/N_f indicates the average time a women spend for paid work. While the first two equations above show the amount that all men and women work, the last equation shows how an individual woman divides her time between paid and unpaid work. Figure 1.1 illustrates the relationship between output and male, female labor in addition to the time use for unpaid work. L_f, labor demand curve in the female sector, is steeper than L_m, labor demand curve in the male sector, as a result of greater labor intensity.

Figure 1.1: Labor output relationship, unpaid work



As with most structuralist model, a mark-up rule determines the price level, and it can be shown as $P = w_m b * \sigma_m(1+\tau) + w_f c * \sigma_f(1+\theta)$ where τ and θ are the mark-up rates for male and female sectors, σ_m is the male sector's share of total market output, and σ_f is the female sector's share of total market output. Mark-up parameters, τ and θ are fixed, $0 < \tau < 1$, $0 < \theta < 1$. They reflect the power of capitalist and organized labor, and the distributional process in each sector. Similar to the parameters that Taylor(1990) describes, some parameters identifies the other. In this model, these parameters are $1 + \tau = \frac{1}{1-\pi_m}$ and $1 + \theta = \frac{1}{1-\pi_f}$.

The price level is

$$P = \frac{w_m b * \sigma_m}{1-\pi_m} + \frac{w_f c * \sigma_f}{1-\pi_f} \tag{1.4}$$

where w is nominal wage rate, π_m is the profit share of male intensive sector, π_f is the profit share of female intensive sector. The female real wage is

$$\omega_f = \frac{w_f}{\frac{w_m b * \sigma_m}{1-\pi_m} + \frac{w_f c * \sigma_f}{1-\pi_f}} \tag{1.5}$$

$$\omega_f = \frac{w_f(1-\pi_m)(1-\pi_f)}{w_m b * \sigma_m(1-\pi_f) + w_f c * \sigma_f(1-\pi_m)} \tag{1.6}$$

or

$$\omega_f = \frac{(1-\pi_m)(1-\pi_f)}{\frac{w_m}{w_f} b * \sigma_m(1-\pi_f) + c * \sigma_f(1-\pi_m)} \tag{1.7}$$

Similarly, the male real wage is

$$\omega_m = \frac{w_m}{\frac{w_m b * \sigma_m}{1-\pi_m} + \frac{w_f c * \sigma_f}{1-\pi_f}} \tag{1.8}$$

$$\omega_m = \frac{w_m(1-\pi_m)(1-\pi_f)}{w_m b * \sigma_m(1-\pi_f) + w_f c * \sigma_f(1-\pi_m)} \tag{1.9}$$

or

$$\omega_m = \frac{(1-\pi_m)(1-\pi_f)}{b * \sigma_m(1-\pi_f) + \frac{w_f}{w_m} c * \sigma_f(1-\pi_m)} \tag{1.10}$$

where Y is total market output, and Y_h is total non-market output. The female market output (Y_f) and the male market output (Y_m) represent the output of paid employment. Total output is

$$Y_T = Y + Y_h \tag{1.11}$$

$$Y = Y_m + Y_f \tag{1.12}$$

$$Y_T = Y_m + Y_f + Y_h \tag{1.13}$$

The output amounts in the male and female sectors are proportions of the total market output, $Y_m = \sigma_m Y$ and $Y_f = \sigma_f Y$ where $\sigma_m + \sigma_f = 1$. For the simple case, the

parameters σ_m and σ_f are assumed to be constant as a simplifying assumption. This assumption is relaxed later. Constant output shares imply that capacity utilization is the same across sectors. Because it is a short run model, capital is not mobile between sectors. $K = K_m + K_f$ where K_m is the capital stock in the male sector, and K_f is the capital stock in the female sector. Capacity utilization, z, is equal to $Y/\overline{Y}$ where $\overline{Y}$ is the full capacity output. Capacity utilization in male and female sectors are $z_m = Y_m/\overline{Y_m}$, and $z_f = Y_f/\overline{Y_f}$.

The profit rate is

$$\wp = R/K = (R/Y)(Y/\overline{Y})(\overline{Y}/K) \tag{1.14}$$

where R is total profit, R/Y is profit share(π), $Y/\overline{Y}$ is capacity utilization(z), $\overline{Y}/K$ is full capacity output divided by the capital stock.

We define call full-capacity output divided by the capital stock as k.

$$k = \frac{\overline{Y}}{K} \tag{1.15}$$

For each sector this expression will be $k_i = \frac{\overline{Y}_i}{K_i}$ where $i = m, f$ for male and female sectors. Therefore, we can show the capital stock as follows:

$$K = \frac{\overline{Y}}{k} = \frac{\overline{Y}_f}{k_f} + \frac{\overline{Y}_m}{k_m} = \frac{\sigma_f \overline{Y}}{k_f} + \frac{\sigma_m \overline{Y}}{k_m} \tag{1.16}$$

If we divide each side by the full capacity utilization,

$$\frac{K}{\overline{Y}} = \frac{\sigma_f}{k_f} + \frac{\sigma_m}{k_m} \tag{1.17}$$

In the model, the state variables are profit share(π), and capacity utilization(z). The relationship between the state variables is reflected by the investment/saving equilibrium (the IS curve) and a supply-side functional relationship capturing the relationship between the profit share and capacity utilization.

1.3.1 The demand side

The IS curve shows the investment and saving relationship which reflects the demand side relationship. Investment divided by capital stock is[3]:

$$i = \frac{I}{K} = i^0 + i[\wp(\pi, z)] = i^0 + i(\pi, z) \tag{1.18}$$

Saving divided by capital stock is given by:

$$s = \frac{S}{K} = [s_\pi \pi + s_w(1 - \pi)]z \tag{1.19}$$

In equilibrium, investment and saving are equal, $i = s$. We can derive the IS curve by finding the set of points satisfying this equilibrium relationship.

$$i^0 + i(\pi, z) = [s_\pi \pi + s_w(1 - \pi)]z \tag{1.20}$$

$$i_\pi d\pi + i_z dz = (s_\pi - s_w)z d\pi + [s_\pi \pi + s_w(1 - \pi)]dz \tag{1.21}$$

---

[3]In the long-run, there will be also an investment in human capital as a result of non-market work; however, because this is a short-run model, I did not include household investment.

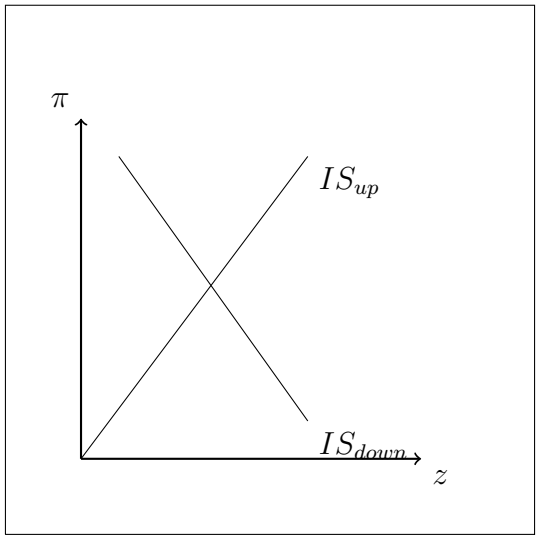
$$[i_\pi - (s_\pi - s_w)z]d\pi = \{[s_\pi\pi + s_w(1-\pi)] - i_z\} \tag{1.22}$$

$$\frac{d\pi}{dz} = \frac{s_\pi\pi + s_w(1-\pi) - i_z}{i_\pi - (s_\pi - s_w)z} \tag{1.23}$$

The slope of the IS curve indicates whether the economy is wage led or profit led[4]. The Keynesian stability condition requires that $s_\pi\pi + s_w(1-\pi) - i_z > 0$. In other words, saving is more responsive than investment to changes in capacity utilization. Therefore, if the Keynesian stability condition holds, the numerator is positive. If $(s_\pi - s_w) - i_\pi > 0$ then the denominator is negative and IS curve is downward sloping. If $(s_\pi - s_w) - i_\pi < 0$ then the denominator is positive and IS curve is upward sloping. Downward and upward sloping IS curves are illustrated in Figure 1.2.

[4]The purpose of this study is not to contribute to the wage led vs. profit led economy discussion but to use this framework to analyze the impact of a macroeconomic policy change.

Figure 1.2: Downward and upward sloping IS curve



1.3.2 The supply side

Supply-side relations are derived from the equations describing the product market. The price level for the male sector is given by:

$$P_m = (1 + \tau)bw_m \tag{1.24}$$

The price level for the female sector is represented by:

$$P_f = (1 + \theta)cw_f \tag{1.25}$$

From these expressions, we can calculate the general price level:

$$P = w_m b * \sigma_m(1 + \tau) + w_f c * \sigma_f(1 + \theta) \tag{1.26}$$

Wages are a function of capacity utilization, such that:

$$w_m = w_m(z) \tag{1.27}$$

$$w_f = w_f(z) \tag{1.28}$$

We can represent the producer's equilibrium as follows:

The male intensive sector:

$$\pi_m = 1 - bw_m(z) \tag{1.29}$$

The female intensive sector:

$$\pi_f = 1 - cw_f(z) \tag{1.30}$$

Aggregating across sectors gives us:

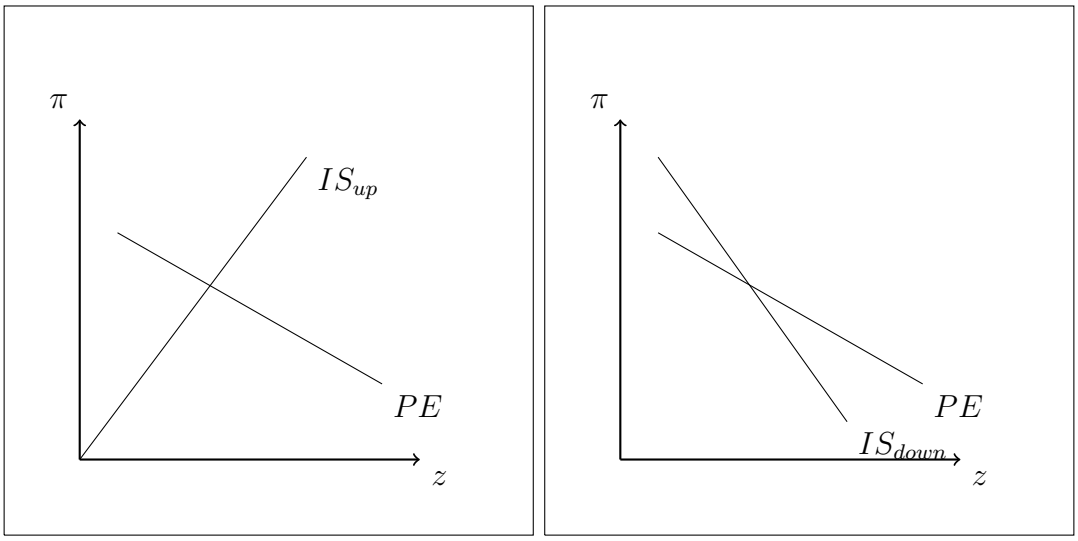
$$\pi = 1 - [\sigma_m bw_m(z) + \sigma_f cw_f(z)] \tag{1.31}$$

$$\frac{d\pi}{dz} = -(\sigma_m bw_{m_z} + \sigma_f cw_{f_z}) \tag{1.32}$$

The slope of PE curve, given by Equation 1.32, depends on how nominal male and female wage rates change with capacity utilization (w_{m_z} and w_{f_z}). Increase in

capacity utilization decrease unemployment rates, and increases worker's bargaining power relative to capital [5]. As discussed in Taylor (1990); Braunstein (2000); Braunstein et al. (2011), bargaining power is one of the factors that determines nominal wages. Workers who gain more bargaining power receive higher wages. Therefore, we assume that nominal wages increases with a rise in capacity utilization. In this case, the PE curve is downward as shown in the Figure 1.3.

Figure 1.3: Downward PE curve with upward and downward IS curve



[5]There is also a gender difference for bargaining powers of women and men. I will address this in other sections.

1.4 Aggregate Demand Shocks

1.4.1 The effects of fiscal policy

In this section, I modify the IS schedule to introduce the effects of fiscal policies. The simple investment-savings equilibrium can be augmented to include fiscal balances. Incorporating the public sector, we can express the saving-investment equilibrium in terms of public and private savings and investments as follows:

$$(Y - T - C) + (T - G) = I_{public} + I_{private} \tag{1.33}$$

where T, C, G are tax revenues, consumption, and government spendings respectively; and $(Y - T - C)$, $(T - G)$, I_{public}, $I_{private}$ show private savings, public savings, public investment, and private investment respectively. Similar to Dutt (1984), I add a government budget constraint. The government budget equation is as follows:

$$pG = t_w(w_m L_m + w_f L_f) + t_c rpK + D \tag{1.34}$$

where G is government expenditure, t_c is a tax on capitalist income, t_w is a tax on the income of paid workers, and D is the government fiscal deficit in money terms. For simplicity, I ignore indirect taxes on commodities. When the government balances its budget, $D = 0$. The fiscal policy variables are G, t_c, t_w. The commodity market equilibrium condition is

$$Y = C + I + G \tag{1.35}$$

If we divide each component of the commodity market equilibrium by the capital stock, the total market output-capital ratio is

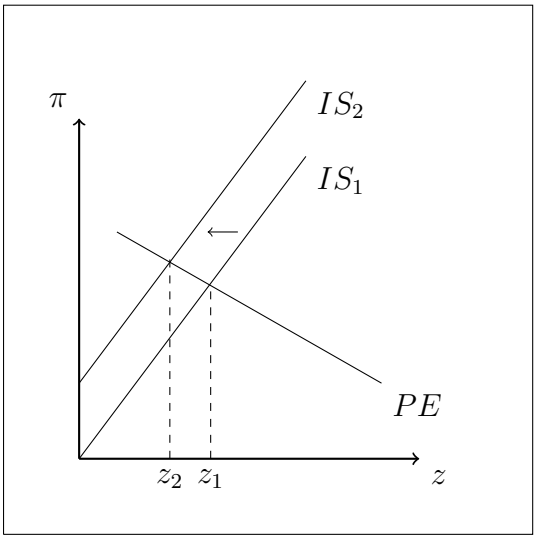
$$u = \frac{C + I + G}{K} \tag{1.36}$$

$$z\frac{\overline{Y}}{K} = \frac{C + I + G}{K} \tag{1.37}$$

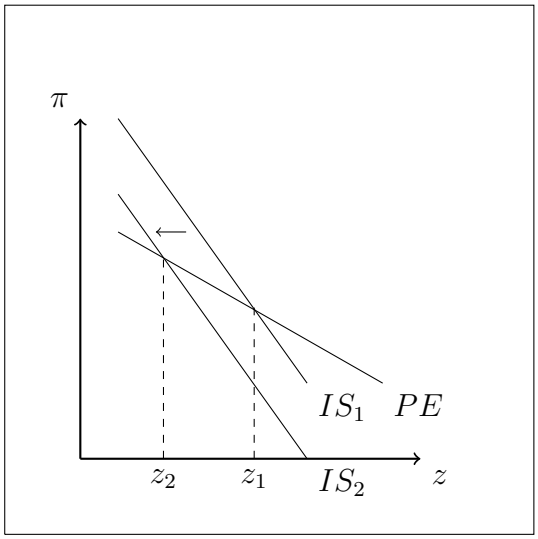
where $u = \frac{Y}{\overline{Y}}\frac{\overline{Y}}{K} = z\frac{\overline{Y}}{K}$. To look at a change in a policy variable, we need to keep the other two parameters fixed. When government expenditures change, the output-capital ratio increases/decreases due to the increase/decrease of the government spending capital ratio. Because the full capacity output - capital stock ratio is constant, the change in the output-capital ratio will be equal to the change in capacity utilization. Therefore, contractionary fiscal policy by decreasing government spending, $\frac{G}{K}$, will decrease capacity utilization. An increase in government expenditures will increase the capacity utilization, and shift the IS curve to the right. Similarly, a decrease in G, would shift the IS curve to the left, from IS_1 to IS_2 as shown in Figure 1.4.

Figure 1.4: The effect of a decrease in government expenditures

(a) with an upward sloping IS curve



(b) with a downward sloping IS curve



An aggregate demand shock which is caused by a fiscal policy change will shift the IS curve. A contractionary fiscal policy would shift the IS curve to the left, and capacity utilization will decrease from z_1 to z_2. Because the full capacity output is constant, total market output declines.

1.4.1.1 Output and employment

The responsiveness of each sector to aggregate demand shocks determines the capacity utilization in these sectors. Depending on the capacity utilization in each sector, male and female employment reacts to fiscal policies (or monetary policies) differently. I consider two cases. In the first case, for simplicity, I assume that the responsiveness is the same across sectors and capacity utilization responds identically

in each sector. In the second case, I present a model in which capacity utilization responds differently in each sector. In addition, women supply labor to unpaid care activities in the household.

Output share of male sector at full capacity output is represented by $\overline{\sigma_m} = \frac{\overline{Y_m}}{\overline{Y}}$. Similarly, the output share of female sector at full capacity utilization is $\overline{\sigma_f} = 1 - \overline{\sigma_m} = \frac{\overline{Y_f}}{\overline{Y}}$. Total capacity utilization and capacity utilization in each sector is described below.

$z = \frac{Y}{\overline{Y}}$, $z_m = \frac{Y_m}{\overline{Y_m}}$, $z_f = \frac{Y_f}{\overline{Y_f}}$.

The actual output shares of male and female sectors are therefore given by:

$$\sigma_m = \frac{Y_m}{Y} = \frac{\overline{\sigma_m} z_m}{z} \tag{1.38}$$

$$\sigma_f = 1 - \sigma_m = \frac{Y_f}{Y} = \frac{\overline{\sigma_f} z_f}{z} \tag{1.39}$$

- Case 1: Same capacity utilization:

In the basic model, we first assume that capacity utilization in each sector equals to total capacity utilization. Total capacity utilization is equal to summation of capacity utilization times the output share at full capacity output in each sector. We can define the total capacity utilization as follows:

$$z = z_m \overline{\sigma_m} + z_f \overline{\sigma_f} = z_m \overline{\sigma_m} + z_f (1 - \overline{\sigma_m}) \tag{1.40}$$

The total market output will change as a result of a monetary or fiscal policy change. In this model, output changes in each sector will be equal to the total

market output change times the output share (which must be constant if capacity utilization is identical). The parameters that show the output share in male and female sectors are σ_m and σ_f. When the capacity utilization is same across sectors, these parameters will be constant, and same as the output share in full capacity output. The output changes in male and female sectors are:

$\Delta Y_m = \sigma_m \Delta Y = \overline{\sigma_m} \Delta Y$

$\Delta Y_f = \sigma_f \Delta Y = \overline{\sigma_f} \Delta Y$

Because labor-output parameters, b and c are positive, a decrease in output will decrease the employment for both men and women. L_f, the female labor demand curve, is steeper than L_m, the male demand curve. The effect on male output is

$$\Delta L_m = b\overline{\sigma_m} \Delta Y \tag{1.41}$$

The effect on female output is

$$\Delta L_f = c\overline{\sigma_f} \Delta Y \tag{1.42}$$

The change in average time use in unpaid work is

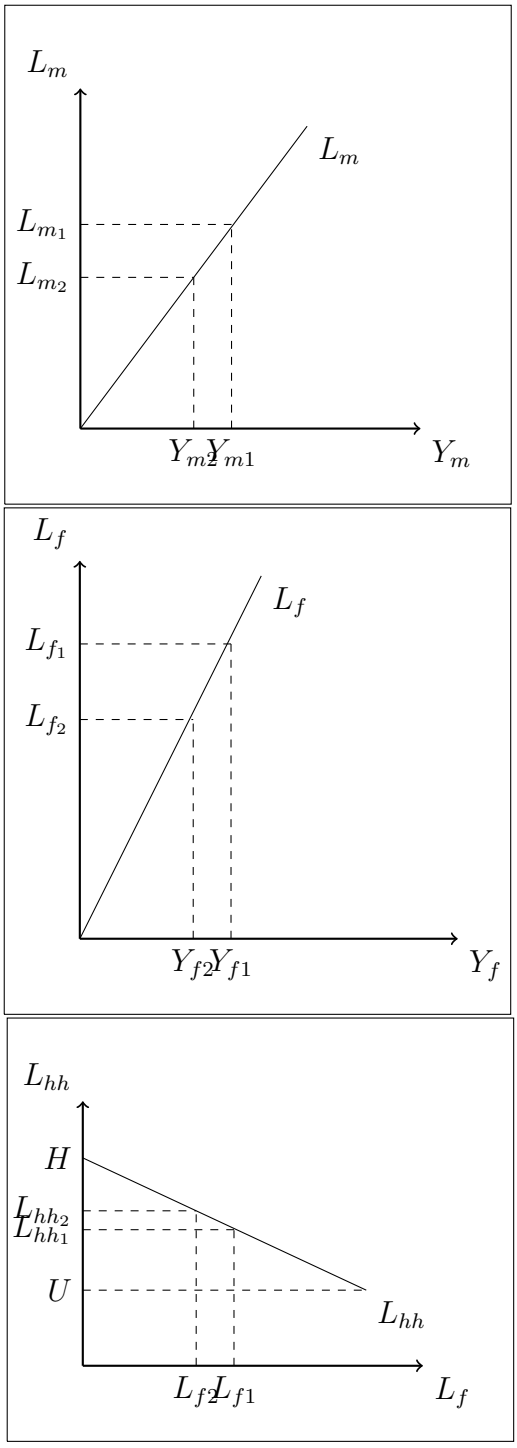
$$\Delta L_{hh} = -\frac{1}{N_f} \Delta L_f \tag{1.43}$$

$$\Delta L_{hh} = -\frac{c\overline{\sigma_f} \Delta Y}{N_f} \tag{1.44}$$

As shown in Figure 1.5, male employment, female employment, and average work time will move from L_{i1} to L_{i2} where $i = m, f, hh$. The same amount of decline in output leads to a relatively larger decline in female employment because female sector is more labor intensive. With a decline in the market output, the time spent for unpaid work increases.

The impact of macroeconomic policy changes on output might increase women's employment, and it also implies that women might do less unpaid care work. However, it is not clear that if the total production of goods and services would increase. Even though it is unpaid and most of the time it is unrecognized, women's unpaid domestic work constitutes a significant part of production. Thus, the overall welfare effect is unclear.

Figure 1.5: Labor output relationship, unpaid work, with the simple function



- Case 2: Different capacity utilization in each sector:

In this case male and female sectors can respond differently to the changes in aggregate demand. Total capacity utilization represents changes in aggregate demand, and each sector has different capacity utilization.

$$z_i = d_i z \tag{1.45}$$

where $i = m, f$, and d_i is a parameter that shows the proportion of capacity utilization in each sector. When the capacity utilization is same across sectors, $d_m = d_f = 1$. If $d_m > 1$ and $d_f < 1$, the male sector is more responsive to changes in aggregate demand. If $d_m < 1$ and $d_f > 1$, the female sector is more responsive to changes in aggregate demand. The expression for calculating total capacity utilization is as follows:

$$z = d_m z\overline{\sigma_m} + d_f z\overline{\sigma_f} \tag{1.46}$$

$$1 = d_m\overline{\sigma_m} + d_f\overline{\sigma_f} \tag{1.47}$$

Since the shares of potential output are given in the short-run, once we know d_m, we automatically know d_f.

$$d_f = \frac{1 - d_m\overline{\sigma_m}}{\overline{\sigma_f}} = \frac{1 - d_m\overline{\sigma_m}}{1 - \overline{\sigma_m}} \tag{1.48}$$

This implies that if the male sector is more responsive to changes in capacity utilization, the female sector must be less responsive, and vice versa.

In this case, the capacity utilization is different across sectors. Capacity utilization in each sector is a parameter (d_i) times total capacity utilization. The output changes in each sector can be defined as follows:

$$\Delta Y_m = \sigma_m \Delta Y = \overline{\sigma_m} d_m \Delta Y \tag{1.49}$$

$$\Delta Y_f = \sigma_f \Delta Y = \overline{\sigma_f} d_f \Delta Y \tag{1.50}$$

Different capacity utilization in each sector will also affect employment in each sector. Employment changes in male and female sectors can be expressed as follows:

$$\Delta L_m = b\overline{\sigma_m} d_m \Delta Y \tag{1.51}$$

$$\Delta L_f = c\overline{\sigma_f} d_f \Delta Y \tag{1.52}$$

The change in the average unpaid work time is as follows:

$$L_{hh} = \frac{-c\overline{\sigma_f} d_f \Delta Y}{N_f} \tag{1.53}$$

Below, I present examples for each case. In the first one (Case 2a), the female sector reacts more to changes in aggregate demand, and in the second one (Case 2b), aggregate demand changes affect the male sector more.

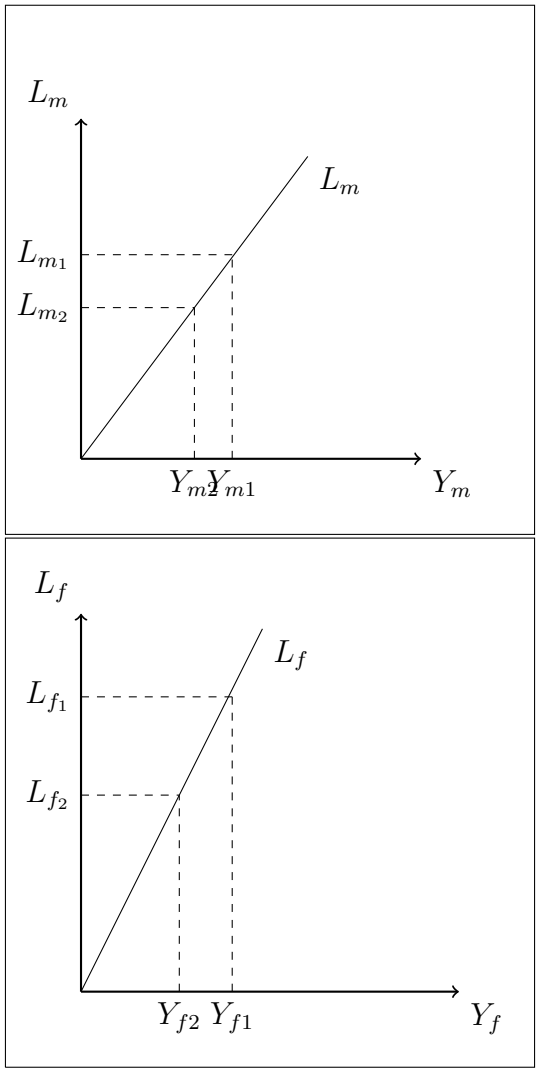
- Case 2a:

As an example, assume that at the full capacity utilization, the male sector constitutes 60% of the market economy and the female sector has 40% output share. Suppose the male sector is less responsive to changes in aggregate demand, so $d_m = 0.8$. When total capacity output drops by 10%, capacity utilization in the male sector only drops by 8%. In this case, d_f is equal to 1.3. Capacity utilization in the female sector drops by 1.3 times total capacity utilization. Similarly, output in this sector declines more.

$$d_f = \frac{1 - (0.8 * 0.6)}{0.4} = 1.3 \tag{1.54}$$

In this case, female sector will be more affected from the decline in capacity utilization. This case can be illustrated with the following graphs:

Figure 1.6: Labor output relationship, unpaid work, with the simple function



In the above example, the female sector reacts changes in aggregate demand more. Therefore, in this case, there are two channels through which macro policy can affect women's employment disproportionately: the labor intensity of production, and the responsiveness to aggregate demand.

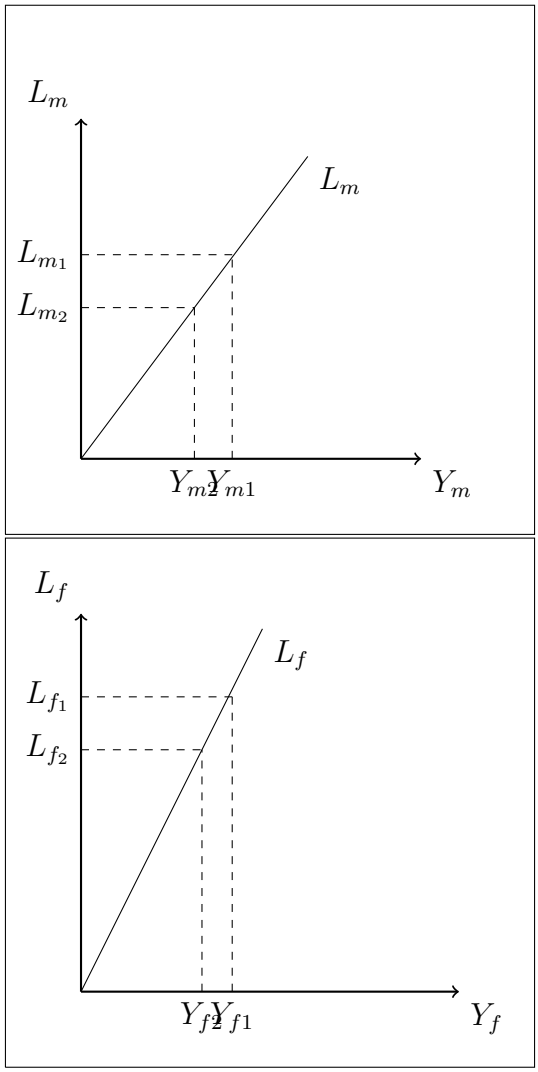
- Case 2b:

Now in this example, let's suppose the output share is the same as the above example but the male sector is more responsive to the changes in aggregate demand. For example, if $d_m = 1.2$, capacity utilization in the male sector would drop 1.2 times as the drop in the total capacity utilization, and d_f would be equal to 0.7. In this case, female sector is less sensitive to aggregate demand changes. A drop in total capacity utilization would have a larger negative effect on women's employment because of labor intensity but could affect men's employment more because of sensitivity to aggregate demand. The total effect is uncertain. If the labor intensity in the female sector has a greater effect than different capacity utilization rates, aggregate demand shocks affect female employment more. If capacity utilization has greater influence, male employment will be affected more. This case could explain the scenario where male sector is more affected from economic crises, which has been referred in the literature as the case of a 'man-cession'.

$$d_f = \frac{1 - (1.2 * 0.6)}{0.4} = 0.7 \tag{1.55}$$

In this case, while d_m is larger than 1, d_f is smaller than 1. Therefore, the decline in the capacity utilization would be larger in the male sector. Figure 1.7 illustrates this case. However, because female sector is more labor intensive, the overall effect is ambiguous.

Figure 1.7: Labor output relationship, unpaid work, with the simple function



1.4.1.2 Extension for unpaid work

Women divide their working time between paid and unpaid work. In the benchmark model, women do unpaid work as much as the maximum amount among the following two: minimum required unpaid work time (U) and the difference between

the maximum work time and average paid work time. The benchmark model for the unpaid work time is

$$UWT = max\{U, H - \frac{L_f}{N_f}\} \tag{1.56}$$

In the extended version, maximum working hours are also endogenous, and a function of total household income available for spending on substitutes for services produced with unpaid work.

$$H = H[a(w_m \frac{L_m}{N_m}) + (w_f \frac{L_f}{N_f})] \tag{1.57}$$

where a is a parameter that represents the degree of income pooling, and $0 \leq a \leq 1$. The degree of income pooling reflects the amount of men's income that can be spent on substitutes for women's unpaid work. If a is equal to zero, H only depends on women's income. In this case, women need to use only their income in order to substitute away form unpaid work. As a increases, which represents more income pooling in the household, H depends more on household income. If a is equal to 1, maximum working hours for women are a function of total household income.

Male and female income has two components: male and female wages times male and female average paid working hours ($w_m \frac{L_m}{N_m}, w_f \frac{L_f}{N_f}$). An increase in capacity utilization, actual output divided by full capacity output, affects household income by raising both wages and paid employment. Higher output will increase employment or paid work time, which also increases household income. When household income increases, maximum hours a woman needs to work will decrease. Similarly, a drop in

the output, as a result of a fiscal or monetary shock, will increase the total amount of time a woman needs to work (including time spent in unpaid work). Therefore, we can express the equation as follows:

$$H = H[a(w_m(\frac{Y_m}{\overline{Y_m}})\frac{L_m(Y_m)}{N_m}) + (w_f(\frac{Y_f}{\overline{Y_f}})\frac{L_f(Y_f)}{N_f})] \tag{1.58}$$

where $L_{mY_m} > 0$, $L_{fY_f} > 0$, $w_{mY_m} > 0$, and $w_{fY_f} > 0$.

The first derivative of H represents the degree to which market income can substitute for non-market work. If H' is equal to zero, they can not buy market substitutes. As H' decreases, this implies a greater degree of substitutions. In the rest of this section, I assume that H' is negative. As households become richer, they can purchase market substitutes and reduce the time spent on unpaid work. In the model, this effectively increases the time women have for leisure or personal care. The extended function of unpaid work time can be expressed as follows:

$$UWT = max\{U, H[a(w_m(\frac{Y_m}{\overline{Y_m}})\frac{L_m(Y_m)}{N_m}) + (w_f(\frac{Y_f}{\overline{Y_f}})\frac{L_f(Y_f)}{N_f})] - \frac{L_f}{N_f}\} \tag{1.59}$$

where $H_{L_m} < 0$, $H_{L_f} < 0$, , $H_w < 0$, and $H_Y < 0$.

Paid work time affects unpaid work time both directly and indirectly through maximum working hours. Maximum working hours will be affected from the average per person paid work time in addition to wages. Maximum working hours decrease with an increase in total income of the household, and they increase with a decrease in income. Both wages and paid work time lead to an increase in total income of

the household. Unpaid work time rises with an increase in maximum working hours. If female and male wages are high, women do not need to work as much so unpaid working time decreases. Households can afford to buy market substitutes of home production or care services.

When contractionary fiscal or monetary policies lead to a decline in market output, total working time for women will increase. Because the household can not afford some of the paid care services, the woman would provide some of the care services without a payment, in other words, unpaid work time for women will increase.

1.4.1.3 Extension for labor supply and unpaid work

This extension formalizes both the unpaid work time and paid work time. In addition to the labor demand function discussed above, a labor supply function can be used to determine paid work time. The labor demand function is the same as the previous sections; $L_f = cY_f$.

Average paid work time is a proxy for the female labor supply for paid work, and it is the difference between the maximum working hours and unpaid work time. Unpaid work time determines the female labor supply in the labor supply function (Equation 1.60). There is a negative relationship between the paid and unpaid work, and paid work time increases with both female and male sectors' market output.

In this section, I assume that non-market household output is a substitute for the output produced by women's paid work. Therefore, the decision between producing with unpaid household labor or purchasing in the market will affect household welfare. Economic expansion increases women's labor supply because of two reasons; paid work opportunities, and the ability to purchase market substitutes.

In this extension, women's decision on the amount of time devoted to paid or unpaid work depends on women's bargaining power in the household. The ratio of women's wage to men's wage is a proxy for women's bargaining power. Thus, intra-household dynamics play a role in women's decision. As the ratio of women's wages to men's wages falls, women specialize more in unpaid work. Unpaid work time function is

$$UWT = UWT(\frac{w_f}{w_m}) \tag{1.60}$$

where $UWT' < 0$.

Average paid working hours of women is a proxy for female labor supply, and it is the difference between women's total working hours minus unpaid work time.

$$\frac{L_f}{N_f} = H - UWT(\frac{w_f}{w_m}) \tag{1.61}$$

In this case, the maximum working hours for women is fixed, and female paid work time responds to household income. Capacity utilization determines wages so when capacity utilization increases, wages also rise. The ratio of female and male wages will be based on responsiveness of wages to capacity utilization. If men's wages respond more strongly than women's, it could mean that women actually specialize more in unpaid work during economic booms.

$$\frac{L_f}{N_f} = H - UWT(\frac{Y_f}{Y_m}) \tag{1.62}$$

This extension emphasizes the labor supply side more than the labor demand side. In some cases, labor supply would determine output in the female sector rather than aggregate demand - i.e. total output will be constrained by the supply of labor more than demand for output. Of course, if the demand falls to a low level, not all women can be employed when women's wages are high.

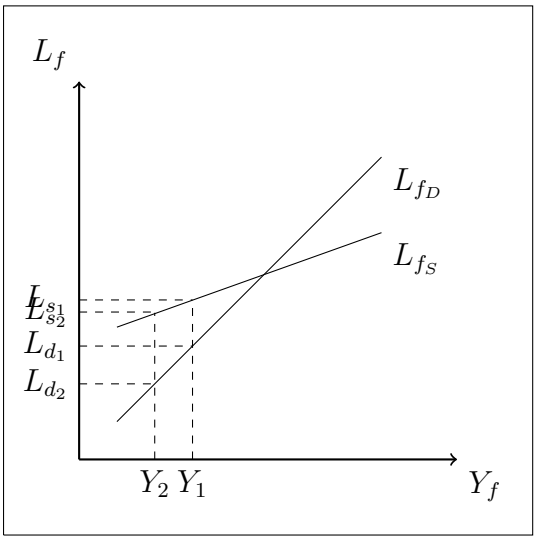
Both female labor demand and female labor supply has a positive relationship with the output in the female sector. When there is more output, employers want to hire more workers. When there is more output, nominal wages also increase so women do not need to do as much unpaid domestic work, which increases the supply for paid work. The difference between the labor supply and the labor demand represents unemployment. The amount of the female unemployment depends on the relative responsiveness of labor demand and labor supply to the output change.

A decline in female employment can result from either a labor demand (derived from aggregate demand) or a labor supply constraint (when women are increasingly specializing in unpaid household production). Cuts in government spending have a direct effect on both labor demand and labor supply. The relative responsiveness of labor supply and labor demand to output determines whether demand or supply is a constraint for female employment. The level of output also has a role in determining the constraint. I examine four cases to discuss labor demand and supply constraints. Firstly, I present the case that labor demand in female sector is more responsive to output changes than labor supply. In this case, the labor demand curve is steeper than the labor supply curve in the female sector. In Figure 1.8a, output is under a certain point that there is a demand constraint. There might not be enough jobs

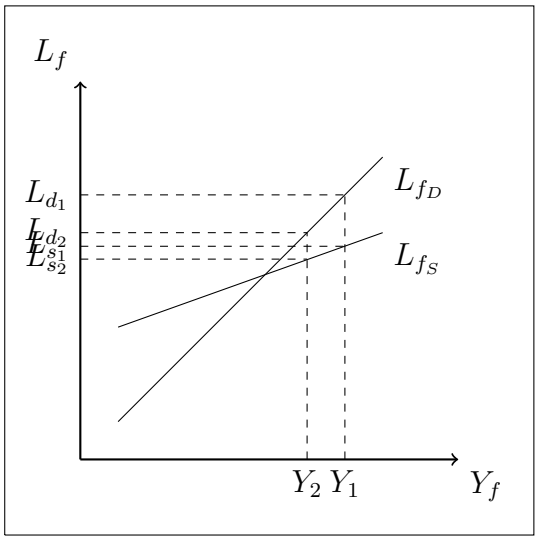
even if women want to work in paid employment. However, if output rises above a certain point, as illustrated in Figure 1.8b, there is a supply constraint.

Figure 1.8: Labor demand and labor supply (when labor demand is more responsive)

(a) Below the equilibrium



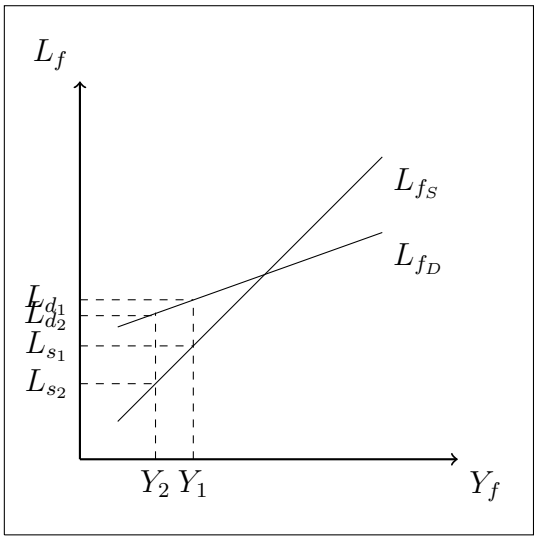
(b) Above the equilibrium



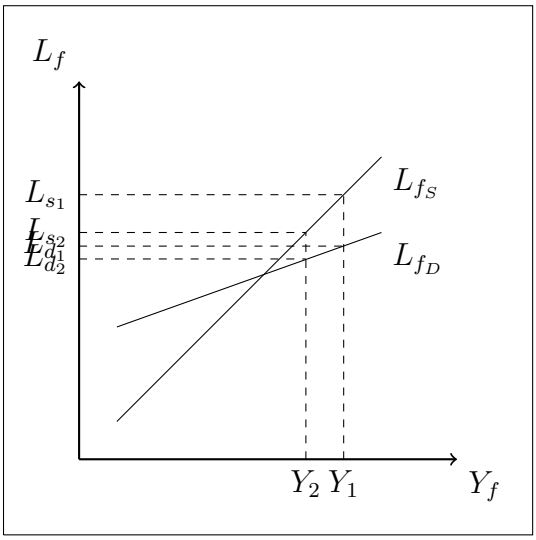
Now, I present the case where the labor supply curve is steeper than the labor demand curve in the female sector. Labor supply is more responsive to an output change than the labor demand. Figure 1.9a and Figure 1.9b show the cases with an output below and above the point at which a supply constraint becomes meaningful. In the first case there is a supply constraint because of the unpaid work burden of women. Even if there are enough jobs, female employment still decreases because of a lack of labor supply. In the second case, there is a demand constraint.

Figure 1.9: Labor demand and labor supply
(when labor supply is more responsive)

(a) Below the equilibrium



(b) Above the equilibrium



1.4.2 The effect of monetary policy

In this section, I discuss the effect of a monetary policy on female and male sectors' output. There are different tools used to conduct monetary policies. One commonly used approach is to target a policy interest rate in order to try to achieve a particular outcome, such as lower inflation or greater employment. In this model, I represent monetary policy decisions using the Taylor rule. The nominal interest rate is a function of the gap between actual and desired capacity utilization, and the gap between actual inflation and desired inflation.

$$n = \overline{r} + \pi^T + \rho_1(z - z^*) + \rho_2(\pi - \pi^T) \tag{1.63}$$

where n is the nominal interest rate, $\overline{r}$ is the constant real interest rate, $z^{\star}$ is the steady growth value of the capacity utilization, π^{T} is the target inflation rate. The inflation rate is

$$\pi = \pi^{e} + \eta_1(z - z^{*}) + \varepsilon \tag{1.64}$$

where π^{e} is the expected inflation, and ε is a supply-side shock variable with an expected value of zero. Connecting the equations (1.63) and (1.64), and using the Fisher equation $r = n - \pi^{e} - \varepsilon$, we can obtain the equation that determines the real interest rate. According to the Fisher equation, $n = r + \pi^{e} + \varepsilon$. If we use this expression for π^{e} in equation 1.64, the nominal interest rate is $n = r+\pi-\eta_1(z-z^{*})+\varepsilon$. If we substitute this equation into equation 63, the rule for targeting the real policy interest rate is

$$r = \bar{r} + (\rho_1 + \eta_1)(z - z^{*}) + (\rho_2 - 1)(\pi - \pi^{T}) = \bar{r} + \tilde{\rho_1}(z - z^{*}) + \tilde{\rho_2}(\pi - \pi^{T}) \tag{1.65}$$

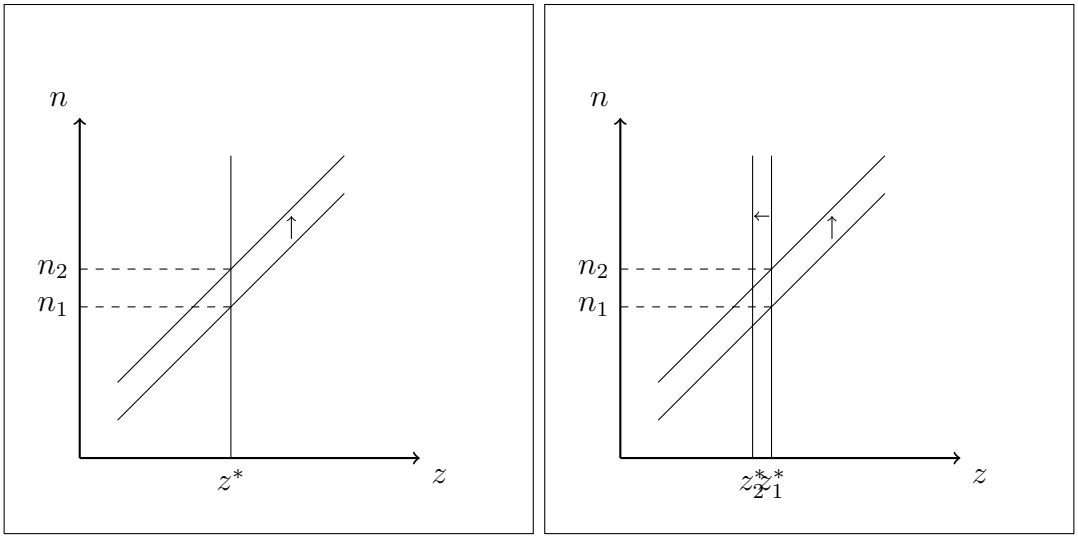
where $\tilde{\rho_1} = (\rho_1 + \eta_1)$, $\tilde{\rho_2} = \rho_2 - 1$.

Policymakers decide the policy interest rate according to an interest rate rule. Equation 1.65 represents this interest rate rule, according to which the real interest rate is equal to its estimate of equilibrium plus a function of capacity utilization and inflation. Central banks target the real interest rate based on that rule. The target of monetary policy can be growth and employment or simply inflation. If the monetary policy target is to lower inflation, policy makers increase the policy

interest rate. Increases in the interest rate will decrease the investment which causes a leftward shift of IS curve. Capacity utilization falls.

The interest rate increases with an increase in capacity utilization. This relationship is shown as the upward shift of the interest rate curve. However, a higher interest rate will decrease investment and shift the IS curve to the left, which causes a decline in the equilibrium level of capacity utilization. Therefore, the capacity utilization in Figure 1.10 shifts to the left. In the new equilibrium, the nominal interest rate is higher.

Figure 1.10: Interest rate and capacity utilization



By considering the monetary policy, I modify the investment function as follows:

$$I = I^0 + I(\wp - r) \tag{1.66}$$

in which investment is also a function of the real interest rate in addition to the profit rate. The real interest rate is simply the opportunity cost, the rate of return of alternative investment. Investment would respond to the difference in the profit on that investment and its opportunity cost.

$$i = \frac{I}{K} = i^0 + i[\wp(\pi, z) - r] \tag{1.67}$$

or

$$i = \frac{I}{K} = i^0 + i[\wp(\pi, z) - r(\pi, z, n)] \tag{1.68}$$

$$i = \frac{I}{K} = i^0 + i(\pi, z, n) \tag{1.69}$$

where $i_n < 0$. By using the new investment demand function, I modify the investment-saving equilibrium, i=s, and the IS schedule.

$$i^0 + i(\pi, z, n) = [s_\pi \pi + s_w(1 - \pi)]z \tag{1.70}$$

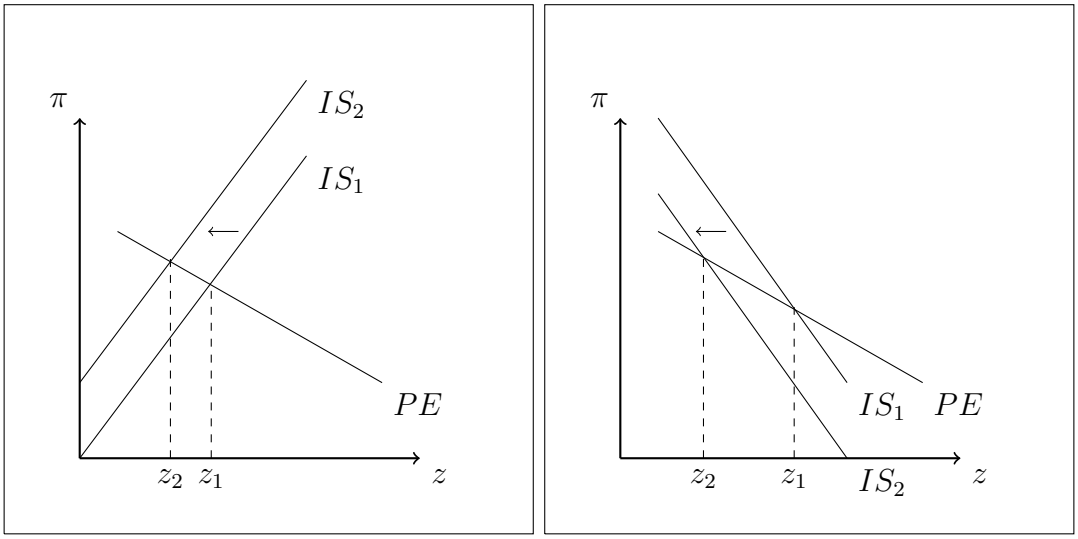
$$i_\pi d\pi + i_z dz + i_n dn = (s_\pi - s_w)z d\pi + [s_\pi \pi + s_w(1 - \pi)]dz \tag{1.71}$$

$$\frac{d\pi}{dz} = \frac{s_\pi \pi + s_w(1 - \pi) - i_z}{i_\pi - (s_\pi - s_w)} \tag{1.72}$$

The relationship between the profit share and capacity utilization is the same in the modified version. However, changes in the interest rate shift the IS curve.

For example, an increase in the interest rate would decrease investment, and shift the IS curve to the left as shown in Figure 1.11. Its impacts on market output and employment would be similar to the contractionary fiscal policy.

Figure 1.11: The effect of an increase in the policy rate



When policymakers care strongly about inflation over market output, they are less likely to pursue expansionary policy and more likely to pursue contractionary policy. Therefore, in an inflation targeting regime, the output and employment will be lower than a regime with both output and inflation targeting.

1.5 Conclusion

This paper analyzes impacts of fiscal and monetary policies on gender disaggregated employment and women's unpaid work by using a structuralist macroeconomic model. In the simple case in which capacity utilization is assumed to be the same

across sectors, aggregate demand shocks affect female employment more because the female sector is more labor intensive. If capacity utilization rate is more responsive to changes in aggregate demand in the female sector, there are two channels through which macroeconomic policies affect women's employment more; the labor intensity of production, and the responsiveness to aggregate demand. If the responsiveness of capacity utilization to aggregate demand is larger in the male sector, the overall effect is uncertain. Macroeconomic policies might affect the male sector more because of its sensitivity to aggregate demand but they might influence the female sector more because of labor intensity.

Higher market output increases both employment and wages. When household income increases, it can be spent on substitutes for women's unpaid work. The amount spent depends on the income pooling between the couple. Increase in women's earnings, or household income if the income pooling is high, would decrease the time spent in unpaid work. On the other hand, when market output declines as a result of aggregate demand shocks, women spend more time in unpaid work because the household cannot afford to buy the paid care services.

In this structuralist model, aggregate demand shocks affect employment mainly through labor demand. However, the last extension of the model shows that aggregate demand shocks may also have an effect on employment indirectly through labor supply. When the household cannot afford to buy market substitutes for unpaid work, women need to spend more time in non-market activities. This could generate a labor supply constraints - meaning that women's paid employment is supply-constrained, rather than demand-constrained. Even if there are enough jobs

in the female sector, women may not do more paid work because of the unpaid work burden.

This paper shows that fiscal and monetary policies might have a disproportionate impact on female employment both directly, and indirectly through women's unpaid work. Women's specialization in unpaid work tends to reduce their bargaining power in the household, and also to increase the reserve army of female labor. However, it is hard to predict the welfare effect. Because women's unpaid work also contributes to the production, the transfer of women's labor from unpaid work to paid work or from paid work to unpaid work might have changes in either direction. This paper does not discuss the measurement of contribution of unpaid work, which can be a further research topic for overall welfare analysis on the gendered effects of macroeconomic policy changes.

CHAPTER 2

THE IMPACT OF FISCAL POLICY ON GENDER-SPECIFIC EMPLOYMENT OUTCOMES

2.1 Introduction

Women and men can experience different employment outcomes as a result of macroeconomic policy choices for a variety of reasons, such as labor market segregation, gender division of labor or labor supply dynamics. Women and men employed in paid jobs are usually concentrated in different economic activities. Fiscal policies can affect these sectors differently, yielding distinct employment outcomes. Gender roles impact the division of labor in the household; women traditionally have burden of unpaid care work while men are the primary breadwinners. Because of this, women's care work responsibility affects their participation in the labor force. In this chapter, I estimate the effects of changes to fiscal policy on women's and men's employment. Specifically, I focus on gender implications of efforts to reduce fiscal deficits, commonly termed "fiscal consolidation".

I empirically examine whether fiscal consolidation disproportionately affects female employment rate in 17 OECD countries[1] during 1978-2009. I also test some

[1]Australia, Austria, Belgium, Canada, Denmark, France, Finland, Germany, Ireland, Italy, Japan, Netherlands, Portugal, Sweden, Spain, United Kingdom, United States

labor demand and labor supply channels to shed light on the channels through which fiscal policies may influence female employment rates relative to male employment rates.

This paper contributes to the literature by investigating gender implications of fiscal consolidation using narrative data derived by Devries et al. (2011). The narrative approach is a methodology that identifies changes in macroeconomic policies by examining historical documents (such as budgets or federal reserve Greenbooks). This approach aims to identify discretionary policy shocks which are not a response to prospective economic conditions. Therefore, it can address potential endogeneity problems which arise from fiscal indicators shifting due to changes in economic conditions other than deliberate policy decisions.

I estimate the dynamic effects of fiscal policy on gender disaggregated employment rates for up to 8 years using Jorda (2005)'s local projections technique, a method designed to estimate and infer impulse responses. For the estimations, I utilize a country level annual panel dataset for OECD countries, and control for country and time fixed effects, and country specific time trends. I use panel data analysis because it produces results that are common across countries while controlling for unobserved country-specific factors.

The results show that discretionary fiscal consolidation, which is primarily motivated by the goal of reducing budget deficits, has a disproportionate impact on female employment. The effects are stronger between 3-6 years after fiscal consolidation. The impact is driven by the effect on female employment, and spending-based fiscal consolidation. The results are robust to controlling for the female labor force

participation rate, sectoral structure of the country, and female employment shares in different economic activities. Although work-family policies may have an impact on the relationship between fiscal policies and gender-specific employment outcomes, estimates using available data are inconclusive.

The structure of the paper is as follows. In the next section (Section 2), I summarize the literature on fiscal policy and gender. Section 3 discusses possible channels of disproportionate effects of fiscal policies on gender-specific employment rates. Section 4 explains the data and methodology used, and presents the empirical analysis and results. Specifically, I present the impact of fiscal consolidation on gender disaggregated employment rates, the difference between tax and spending-based fiscal consolidation, and several robustness checks. Finally, Section 5 concludes.

2.2 Literature Review

Although the literature on the gender aspects of fiscal policies is broad, I focus specifically on gender-specific employment outcomes of fiscal policies. The broader literature examines a range of topics such as structural adjustment policies (Cagatay, 2003; Elson, 1995a; Beneria, 1995), gender responsive budgeting[2] (Cagatay, 2003; Elson and Sharp, 2010), tax policies (Grown, 2010; Valodia, 2010; Elson, 2006; Barnett and Grown, 2004), and economic crises and austerity policies (Cagatay, 2003; Ortiz and Cummins, 2013; Bettio and Verashchagina, 2014; Rubery, 2014; Albelda, 2014;

[2]Gender responsive budget analysis is an area that proposes ways to challenge the distributive outcomes implicit in standard approaches to public finance, and may represent a step towards a gender-equal and pro-poor budget.

Rubery and Rafferty, 2014). However, this literature is general and mostly descriptive. Here I focus on more specific employment effects using econometric analysis.

Research on relative employment rates by gender suggests asymmetric effects of fiscal policies that vary over the business cycle. However, the findings of research studies vary considerably. Bredemeier et al. (2015) argue that contractionary non-fiscal shocks decreases male employment rates more than female employment rates while expansionary fiscal shocks raise female employment rates relatively more. They explain this impact through an increase in employment in female-dominated occupations. Perivier (2018) finds mixed patterns among countries in terms of the effect of crisis and austerity on female and male employment rates. For example, while Spain is an example of 'he-cession to sh(e)-austerity'[3], in Denmark and the United Kingdom, women experienced the negative effects of recession more acutely than men, and in Greece both men and women experienced dramatic decrease in employment. Hoynes et al. (2012) indicate that because men are concentrated in cyclically sensitive industries, they experience more pronounced cyclical labor market outcomes as a result of both recession and recovery. They also show that some groups experienced the employment effects of the Great Recession more than other groups in the United States. Employment of men, blacks, Hispanics, youth, and those with lower education levels fell more than women, white, prime-aged workers, and those with higher education levels. Akitoby et al. (2019) show that expansionary fiscal shocks during

[3]Karamessini and Rubery (2014) use this phrase to express that recession affects sectors in which men are over-represented (construction and manufacturing), and austerity policies influence sectors that over-represent women (the public sector, services).

recessions have a positive impact on gender equality in employment, while the effect is smaller during booms. They explain the increase in female employment relative to male employment during recessions by gender dynamics in industries, occupations, and employment types.

There is also a literature that discusses effects of specific fiscal policy instruments using cross-country data. Ortiz and Cummins (2013) examine two variables as indicators of total government spending: public expenditure as a percentage of GDP, and the real value of public expenditure using data from International Monetary Fund (IMF) fiscal projections and IMF country reports in addition to the literature review of historical evidence and World Bank surveys. They analyze projections for 128 developing countries in 2012. They look at two sub-periods; the period of fiscal stimulus packages during 2008-09, and the period of fiscal austerity during 2010-2012. They examine four adjustment policies that are often implemented under fiscal austerity: cutting the wage bill of public sector employees, removing subsidies, achieving cost saving, and reforming old-age pensions to scale back public spending (Ortiz and Cummins, 2013, p.67-68). Their results indicate that all of these adjustment policies disproportionately affect children and women mostly through changes in social sector spending allocations. Braunstein and Seguino (2018) examine the impact of economic policy and structural change on gender employment inequality in Latin America from 1990 to 2010. They evaluate the effects of social and economic policies, macroeconomic policies and measures of economic structure on gender equality. They look at the impacts of several variables. Two of the variables examined represent important fiscal policy indicators: social public expenditures made by central

governments as a share of GDP and public investment as a share of GDP. They utilize two estimation techniques: simple OLS (fixed effect panel estimation technique) and two stage least squares (2SLS). Their results show that higher social spending increases women's employment. Even though, public investment improves both male and female employment, female employment increases more.

The role of the public sector, which is often dominated by female employment, is an important factor to understand the gender impact of budget cuts. Public sector jobs and public services are essential for providing women opportunities for paid employment, and they affect the burden of unpaid household work(Rubery, 2014, p.33). Therefore, budget cuts tend to affect women more heavily than men. Even though economic crises might first affect private male dominated sectors, austerity measures in response to the downturn affects the public sector, which can have a disproportionate impact on women. On the other hand, Karamessini (2014, p. 176), investigating the Greek context, argues that, in terms of sheer numbers, men experience the negative effects of budget cuts more because they constitute a higher total share of public employees. However, adoption of 2010-2014 Economic Adjustment Program also affected women workers in Greece. Their public sector employment decreased more than men's mainly because of the impact of voluntary retirement. Mandel and Semyonov (2006) provide a sociological approach to the relationship between state interventions and women's employment opportunities. They show that welfare states help to increase women's labor force participation rate through their roles as a legislator, as a provider of social services, and as an employer. Public

employment provides job opportunities for women especially in care and services job.

The effect of fiscal policies on gender-specific employment rates may be mediated by work-family policies. Therefore, countries with different family policies may experience distinct outcomes with regard to fiscal policies. The sociology literature (Gornick and Meyers, 2003; Mandel and Semyonov, 2005, 2006; Budig et al., 2012; Misra et al., 2012; Boeckmann et al., 2015) considers several work-family policy indicators that capture gender gaps and motherhood penalties. These indicators include maternal and parental leaves, family allowances, and public services for child care. Some uses an index reflecting all policy variables, and some tests each policy variables separately. There are also different approaches for formulating an index. Mandel and Semyonov (2005, 2006) use factor analysis to construct the Welfare State Intervention Index (interventions to facilitate women's employment). Gornick and Meyers (2003) create sub-indices for twenty two policy variables. They rescale the indicators from high value (more policy support) to low value, and rescale all of them again between 0 and 1. They convert rescaled indicators to seven sub-indices. Then they combine these sub-indices using a weighing scheme to produce three indexes. On the other hand, Budig et al. (2012) focuses on two work-family policy indicators: leave policies (maternal and parental leave available to women) and childcare policies. Depending on their length, leave policies may support or discourage women's employment. While women continue their jobs after a moderate leave, they may choose to leave employment as a result of either too long leaves, too short leaves, or the absence of family leave altogether (Budig et al., 2012).

To isolate their effect, fiscal policies should be exogenous to other variables. However, fiscal policies are frequently endogenous and are likely to be correlated with other variables. There are different identification strategies in the literature to deal with this problem, and analyze causal effects of fiscal policies. One common way is using military spending instead of total government expenditures (Ramey and Shapiro, 1998; Ramey, 2009; Nakamura and Steinsson, 2014). However, this approach would not work for the research objectives of this chapter because military spending may have completely different gender effects than total expenditures. The conventional approach that investigates the effect of fiscal consolidation in the literature is the cyclically adjusted primary balance (CAPB) approach (Alesina and Ardagna, 2009), although this approach may underestimate the contractionary effects of fiscal consolidation. In this approach, changes to fiscal policy variables can have an effect on nonpolicy variables that are likely correlated with economic developments that affect output. In addition, discretionary policy changes identified by this approach might be a response to cyclical fluctuations; thus, this approach would suffer from reverse causality(Guajardo et al., 2014).

Another approach that examines the effects of fiscal policy is structural vector autoregression (SVAR) approach (Blanchard and Perotti, 2002; Perotti, 2008)[4]. This method aims to differentiate changes in fiscal variables as a response to output and discretionary fiscal policy changes, and it controls for lags of output growth. However, changes in government revenue and spending may still be correlated with other short

[4]Auerbach and Gorodnichenko (2012) uses STVAR approach, which is similar to smooth transition autoregressive (STAR) models, and includes forecasts in the SVAR.

term factors affecting output. This approach does not take "the issue of non-policy changes in cyclically-adjusted fiscal data, and of forward-looking policy responses to prospective economic conditions" into account (Romer and Romer, 2010; Guajardo et al., 2014, p.950).

Instead, this paper overcomes these limitations by employing a narrative identification approach. The narrative identification approach is the most recent one and has received significant attention since its introduction. The strength of this narrative approach is to address the problems that CAPB and SVAR approaches have. The narrative approach can identify fiscal policies that are not correlated to other economic developments in the short term. The narrative approach has been applied to identify both fiscal (such as Romer and Romer (2010); Ramey and Shapiro (1998); Ramey (2009)) and monetary policies (such as Romer and Romer (2004)). Romer and Romer (2004, 2010) identify discretionary monetary and fiscal shocks in the US respectively. Devries et al. (2011); Guajardo et al. (2014) use the narrative approach to identify fiscal consolidation, and they are the first to apply this approach to construct a dataset of tax and spending changes for multi-country analysis (for OECD countries). There is also an example that uses this approach to study the effects of fiscal consolidation periods Latin American countries (Devries et al., 2011; David and Leigh, 2018). Some papers use the dataset derived by Devries et al. (2011) to examine dynamic effects of fiscal consolidation on several areas such as economic growth and employment (Jorda and Taylor, 2013; Guajardo et al., 2014; Dell'Erba et al., 2014) or income inequality (Ball et al., 2013; Woo et al., 2017; Heimberger, 2018).

The previous literature on fiscal policy and gender suggests the existence of the gendered effects of austerity policies, changes in public spending and public investment. However, a significant part of this literature is descriptive. In the case of other studies with more formal analysis, there is a possibility of the problem that their policy variables are likely to be correlated with the economic outlook. One approach to this problem to is to use narrative data. However, the literature incorporating narrative data does not take gender differences into account. My research combines these two literature, and makes an empirical contribution by using narrative data to analyze the impact of fiscal consolidation of gender-specific employment rates. In that sense, my paper addresses potential endogeneity concerns, and thus provides plausibly causal estimates of the effect of fiscal consolidation on gender-disaggregated employment outcomes.

2.3 Conceptual Framework

I focus on two research questions in the remainder of the paper. Do fiscal policies affect female employment rates disproportionately? And which labor demand and labor supply channels explain the disproportionate impact of fiscal policies when they exist? My hypothesis for the former is that fiscal consolidation with a motivation of decreasing budget deficit has a disproportionate impact on female employment rates. My hypothesis for the latter is that a combination of labor market segregation, the economic structure of the country, and female labor supply are the mechanisms that lead to different employment outcomes for women and men.

Fiscal shocks affect female employment by two main channels: labor demand channels such as labor market segregation and discrimination, and labor supply channels such as burden of unpaid work and household bargaining. Fiscal policies may affect female and male employment rates through aggregate demand shocks and changes to specific areas of budgetary spending. Overall cuts to government spending can cause stagnation which reduces employment opportunities. It decreases employment for both men and women, but it may have a disproportionate impact on women.

If there is a disproportionate effect on the female employment rate, what is the source of the difference - through changes to men's employment, women's employment or both? I argue that the difference is driven by the effect on the female employment rate. Fiscal policies would affect both employment rates; however, male employment can recover faster than female employment, and the negative impact on female employment could last longer.

Fiscal shocks can be either tax-based or spending based. Specifically, fiscal consolidation is applied by cutting expenditures and/or increasing taxes. I argue that the disproportionate effect is driven by spending-based fiscal consolidation. Spending based shocks can affect public services more, which can be both a demand and a supply channel. Because care workers are mostly women, and women also need more public services, cutting expenditures would decrease female employment both directly through the labor demand channel and indirectly through the labor supply channel.

The model, developed in the first chapter, brings a theoretical explanation to possible channels. The two main channels discussed in the model are related to labor market segregation; the labor-intensity of female dominated sector and different responses of capacity utilization rates in male and female dominated sectors. Aggregated demand shocks might affect female employment more because women are employed in more labor intensive sectors or occupations. In addition, different capacity utilization rates would affect the responsiveness of male and female dominated sectors to output changes, which might determine the sector that will be more affected from the aggregated demand shock.

Female and male workers are concentrated in different economic activities as a result of gender segregation in the labor market. Since women are heavily employed in public sector, we expect that these public sector cuts affect female employment more than male employment. To test this channel, I control the results for female employment share in six branches of economic activities, including public administration. This exercise would show if broad changes in the structure of employment is driving the result even though it does not provide an analysis with a data for narrower economic activity branches.

The sectoral structure of the country can affect gendered effects of macroeconomic policies. Fiscal consolidation policies might affect industry, service or agriculture sectors differently. A country with a larger service sector and a country with a larger industry sector may react to same macroeconomic policy differently. Gross value added in each economic activity represents the economic structure in one of the econometric specifications.

In addition, the model also discusses the role of unpaid work burden of women. When fiscal shocks squeeze the household budget, women cannot afford to buy substitutes of unpaid work, and might do more unpaid work. This would affect female labor supply, and create a labor supply constraint. To test labor supply dynamics, I control the results for female labor force participation rate.

Minimizing the role of public provisioning, commodification or marketization bias, often involves reducing budget deficits without increasing the level of taxation but by cutting public expenditures. This has potentially serious implications for the distribution of the costs of social reproduction (Cagatay, 2003). Cuts in public services affect female employment through labor supply channels because public services affect women's unpaid care burden. When macroeconomic policies squeeze household resources through labor market dynamics, this can affect women's labor supply and paid employment in two possible ways. It may increase paid employment of women if women enter the labor force or it may decrease paid employment of women if women withdraw to focus on unpaid household work. Female labor supply may respond to budget cuts because of the need for more unpaid care work. Women who do more unpaid work are required to provide care work if there is not enough provision of public care facilities. Women and poorer segments of the population are more likely to rely on public services. In effect, the state offsets gender biases in private sector employment and transfer payments through social provisioning (Cagatay, 2003, p.19). 'Women-friendly' work-family policies can also help to be attached with employment. Therefore, I control the results for the inclusion of work-family policy variables with available data.

2.4 Empirical Analysis

2.4.1 Empirical strategy

I use a local projections estimation technique with fixed effects to examine the impact of fiscal consolidation on women's and men's relative employment rates, and I utilize annual country level panel data for 17 OECD countries from 1978 to 2009. Local projections have some advantages. It is a flexible method to estimate dynamic effects, and is more robust to misspecification than traditional VAR methods (Jorda, 2005; Jorda and Taylor, 2013)[5]. For example, through this method, I can explain differences in the impacts of fiscal consolidation and fiscal expansion periods on gender disaggregated employment rates.

My econometric specification can be expressed as follows:

$$er_{ct+h} - er_{ct} = \beta_{1h} FC_{ct} + \beta_{2h} X_{ct} + \mu_c + \tau_t + \eta_c + \varepsilon_{ct} \tag{2.1}$$

where er represents the ratio of female emloyment rate to male employment rate, $er_{ct+h} - er_{ct}$ represents the accumulated change from time t to t+h, and β_{1h} is the impulse response in horizon h. FC shows the size of fiscal consolidation as a percentage of GDP, μ_c is country fixed effects, τ_t is time fixed effects, η_c is country specific trends, and ε_{ct} is the error term. X_{ct} is a set of control variables[6]. These control variables include gross value added in agriculture, service, and industry, female employment share in 6 activity branches (agriculture, manufacturing, construction, mining and

[5]It is also easy to include nonlinearities and state-dependent dynamic responses although it is not pursued in this paper.

[6]Table 2.1 shows definitions of all variables in the paper.

quarrying, service, and public administration), and female labor force participation rates as control variables. By incorporating these variables in the regression, I will be able to comment on the possible channels through which fiscal consolidation affects women's and men's employment.

The primary dependent variable of interest is the ratio of female employment rate to male employment rate. I also look at impacts of fiscal policy variables on both female and male employment rates separately to observe if both employment rates are affected significantly. Fiscal policy shocks may also affect the time spent for unpaid domestic care work. Because women do more unpaid care work, using time spent by women in care work as a dependent variable would help reveal any gender impact. However, a lack of data prevents this type of analysis within the framework of this study.

The independent variable of primary interest is the size of fiscal consolidation. Additionally, I employ tax based and spending based fiscal consolidation data to provide information on whether they have different effects. As robustness checks, I include gross value added, female employment share in each economic activity, and FLFPR variables. Even though the data is not available for whole period, I also present an overview of the effects of work family policy indicators.

Table 2.1: Definitions of Variables

Indicators	
Variables	Definitions
er	Ratio of female employment rate to male employment rate
fer	Female employment rate
mer	Male employment rate
μ	Country fixed effects
τ	Time fixed effects
η	Country specific trends
ε	Error term
X	Several possible control variables
EA_i	Gross value added in agriculture, service, and industry
$FLFPR$	Female labor force participation rate
$fshare_i$	Female employment share in agriculture, service and industry
FC	Size of fiscal consolidation as a % of GDP
TFC	Size of tax based fiscal consolidation
SFC	Size of spending based fiscal consolidation

Since the main independent variable is fiscal consolidation (reflects a decrease in government expenditures or an increase in tax revenues), a negative effect means a decrease in government expenditures leads to a relative decrease in the female employment rate. Standard errors are robust to both arbitrary heteroskedasticity and arbitrary autocorrelation.

2.4.2 Data

The main variables for the econometric estimations include fiscal consolidation variables such as size of fiscal consolidation, tax and spending based fiscal consolidation; female and male employment rates; female employment share and gross value added in agriculture, service and industry; female labor force participation rate (FLFPP); and work family policy indicators. The main datasources are several

OECD datasets, ILO datasets and a dataset derived by Devries et al. (2011) with a narrative approach for 17 OECD countries.

Employment rates and labor force participation rate data comes from International Labor Organization (ILO) database of labor statistics. Gross value added in each economic activity data comes from the OECD National Accounts Statistics database. Female employment share as a percentage of total employment in each economic activity data is author's calculation from the data constructed from the ILO database of labor statistics.

For fiscal policy variables, I obtain data from Devries et al. (2011). Devries et al. (2011) construct a dataset for discretionary fiscal policy, which is not a response to cyclical fluctuations. Overall, they report 173 fiscal policy adjustments in 17 OECD economies[7] between 1978-2009. They read budget documents and international institutions' reports to identify fiscal consolidation periods. To find discretionary shocks, they do not include cyclical responses. Discretionary changes in taxes and government expenditures may have two kinds of motivation: to reduce budget deficit and to restrain domestic demand. The dataset only records discretionary fiscal contraction -increase in taxes or decrease in government spendings- primarily motivated by a desire to reduce budget deficits. The dataset includes fiscal consolidation even for the cases followed by an adverse shock or an offsetting countercyclical discretionary stimulus. If there is another fiscal action, not motivated by cyclical fluctuations, that offsets fiscal consolidation, they compute the sum of the measures, and accept

[7]Australia, Austria, Belgium, Canada, Denmark, France, Finland, Germany, Ireland, Italy, Japan, Netherlands, Portugal, Sweden, Spain, United Kingdom, United States

as fiscal consolidation only if the overall change shows budgetary savings. The fiscal consolidation measurements represent the year in which they come into effect, and they are at the general government level unless it is mentioned otherwise. They also treat temporary and permanent measures differently. While temporary measures have positive sign for the period in which they are effective, they have negative sign when they expire. On the other hand, permanent measures have positive sign when they come into effect, and they are recorded as zero afterwards.

The absolute value of the size of fiscal consolidation is between 0 and 1, and the unit of measurement is percentage of GDP. The mean of the variable is 0.003, and it ranges from -0.0075 to 0.0474. The mean and standard deviation of the ratio of female to male employment rates are .0779 and 0.127 respectively, and it ranges from 0.397 to 0.986.

Gender-specific employment rates and female employment shares in different economic activities vary among countries. I present summary statistics by country for these variables in Table 2.2 and Table 2.3. Male employment rates are higher than female employment rates in each country, and standard deviation is usually higher for female employment rate. In Denmark, Finland, and Sweden female and male employment rates are closer relative to other countries. The difference between employment rates is more than 20% in Italy, Ireland, Japan, and Spain. Italy has the highest difference between employment rates with the lowest female employment rate, 40.72%. Japan has the highest male employment rate, 81.35%.

Table 2.2: Summary statistics for employment rates by country

	female employment rate		male employment rate		
Country	mean	sd	mean	sd	obs
Australia	59.01	6.94	77.82	1.93	39
Austria	62.78	3.485	75.76	1.23	24
Belgium	48.87	7.495	67.61	1.02	35
Canada	63.05	6.23	75.84	1.99	40
Denmark	70.31	2.17	79.08	2.22	35
Finland	65.596	3.75	69.30	3.7	28
France	55.25	4.24	69.26	2	35
Germany	58.59	7.52	75.23	2.64	35
Ireland	48.17	11.18	69.95	4.7	35
Italy	40.72	5.41	69.07	2.71	35
Japan	57.1	4.026	81.35	.925	40
Netherlands	59.51	11.12	78	3.9	33
Portugal	58.06	4.31	73.17	4.33	32
Spain	42.25	10.61	66.99	4.926	32
Sweden	71.97	3.24	75.3	3.37	28
United Kingdom	62.72	4.4	76.62	1.71	35
United States	62.905	3.89	77.75	2.97	40
Total	57.86	10.57	74.18	5.25	581

Table 3 shows the summary statistics for female employment share in different economic activities by country. I mainly focus on the highest and lowest female employment shares; in public administration and construction. Female employment share is larger than male employment share in public sector in all countries in the sample, except from Japan with 49.39%. Sweden has the highest female employment share in public administration with 72.09%. Construction is a male-dominated economic activity, female employment share in construction is very low in all countries. The highest female employment share in construction is in Germany with 12.46%.

Table 2.3: Summary statistics for female employment share by country

	in public administration		in construction		
Country	mean	sd	mean	sd	obs
Australia	59.055	3.63	11.94	1.425	23
Austria	59.54	3.44	9.697	1.93	27
Belgium	61.43	2.356	6.99	1.17	18
Canada	63.26	2.12	10.92	.72	23
Denmark	68.53	.84	9.17	1.31	18
Finland	70.99	3.49	8.26	1.46	32
France	64.79	1.58	9.52	.46	18
Germany	61.93	2.02	12.46	.61	18
Ireland	63.5	4.33	4.915	.735	18
Italy	54.87	4.1	5.73	.46	18
Japan	49.39	3.1	15.1	.895	30
Netherlands	61.68	3.285	8.015	.896	18
Portugal	66.84	1.82	4.26	.61	18
Spain	56.13	5.73	4.02	1.665	26
Sweden	72.09	1.43	8.04	.88	27
United Kingdom	66.4	.7	10.19	1.04	18
United States	64.65	3.85	9.916	.46	27
Total	62.56	6.88	8.96	3.18	377

In addition to data sources above, I also use work-family policy indicators in my estimations. I have data for work-family policy indicators from three sources. The first one provides data for length of maternity, paternity, and parental leave; maternity, paternity, and parental leave benefits, and enrollment of children in a publicly supported formal child care or preschool (Irene Boeckmann; Budig and Misra, 2012). These data are available at the cross country level. The second source includes maternity leave, parental leave, family allowances, early childhood care, family taxa-

tion policies, healthcare and diversity indicators[8]. The third source, OECD Family Database, also provides data for work-family policy indicators. For the purpose of this paper, I use the 'public policies for families and children' data from OECD Family Database.

2.4.3 Results

Contractionary and expansionary discretionary fiscal policies might have different gender outcomes. My hypothesis is that while contractionary policy disproportionately affects female employment, expansionary policy might have more benefits for male employment. By using the narrative data set, I can test the effect of contractionary discretionary fiscal policy whereas a narrative data for expansionary policy is not available to test this hypothesis. I report the impact of the size of fiscal consolidation, tax based fiscal consolidation, and spending based fiscal consolidation on the ratio of female employment rates to male employment rates[9].

The local projection for the benchmark specification is as follows. In this specification, I include two-way fixed effects. There are 428 observations. Figure 2.1a and Table 2.4 report the results for the cumulative impact of the size of fiscal consolidation.

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[8]'This dataset was created by Misra, Budig, Boeckmann, Moller, and Strader, with support from grants (0600926, 0751505, and 1022183) from the National Science Foundation'.

[9]Results of regressions are presented in the tables in Appendix B.

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.2}$$

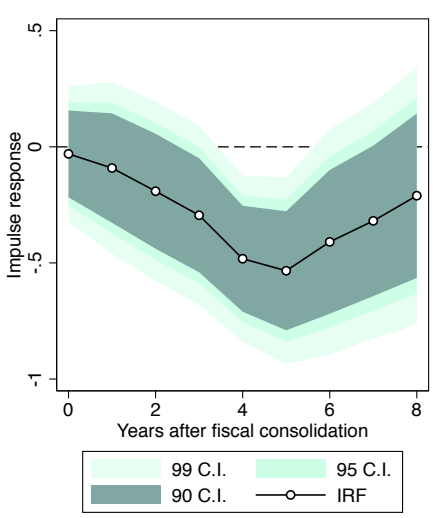
When the size of the shock increases, the female employment rate decreases more than the male employment rate. Results are statistically significant from 3rd to 6th time horizons. In other words, fiscal consolidation has disproportionate effects on women staring from the 3rd year to 6th year after the policy change. A 1 percentage point increase in the measurement of fiscal contraction decreases the ratio er up to 0.534 percentage points. I include country specific time trends in addition to two-way fixed effects in the following specification. I present the results in Figure 2.1b and Table 2.5.

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \mu_c + \tau_t + \eta_c + \varepsilon_{ct} \tag{2.3}$$

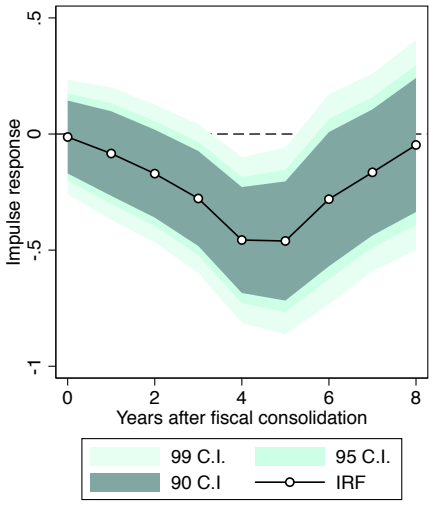
Results show that fiscal consolidation has a significant negative effect on the ratio of female employment rate to male employment rate in the middle of this 8-year period, and results are robust to the country specific time trends. Fiscal consolidation affects female employment rate disproportionately starting from 3 years after the policy until 5 or 6 years after. In the rest of the analysis, I use only two-way fixed effect to increase degrees of freedom[10].

[10]The results that are controlled for country-specific time trends are similar with few exceptions.

Figure 2.1: The cumulative impact of fiscal consolidation on the female to male employment rate ratio (without and with the interaction term)



(a) with two-way fixed effects



(b) with two-way fixed effects and interaction term

Table 2.4: The cumulative impact of the size of fiscal consolidation, with two-way fixed effects

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.092	-0.191	-0.295**	-0.482***	-0.534***	-0.409**	-0.319	-0.211
	(0.143)	(0.150)	(0.149)	(0.139)	(0.156)	(0.188)	(0.197)	(0.215)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2.5: The cumulative impact of the size of fiscal consolidation, with two-way fixed effects and interaction

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.084	-0.171	-0.278**	-0.457***	-0.461***	-0.281	-0.165	-0.047
	(0.111)	(0.115)	(0.124)	(0.139)	(0.156)	(0.176)	(0.165)	(0.175)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The disproportionate effect on female employment rate can result from the effects on both female and male employment rates. Thus, I examine the effects of fiscal consolidation on both female and male employment rates. The following specifications test these impacts:

$$fer_{c,t+h} - fer_{c,t} = \beta_1 FC_{ct} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.4}$$

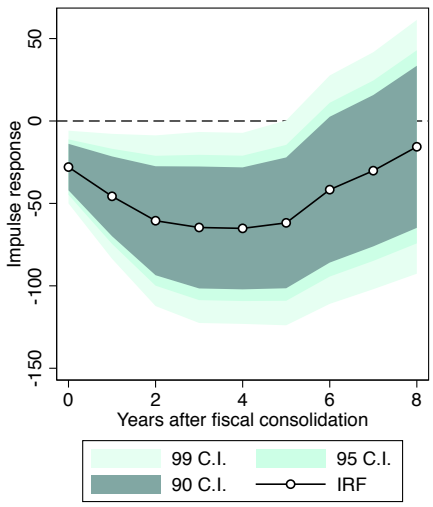
$$mer_{c,t+h} - mer_{c,t} = \beta_1 FC_{ct} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.5}$$

where fer is female employment rate and mer is male employment rate. Figure 2.2 shows the results[11]. While Figure 2.2a and 2.2b indicate impulse responses on female and male employment rates respectively, Figure 2.2c compares the impact on both employment rates. The effects of fiscal consolidation on female employment rate are statistically significant at 1% level until 4 years after, and continues to be

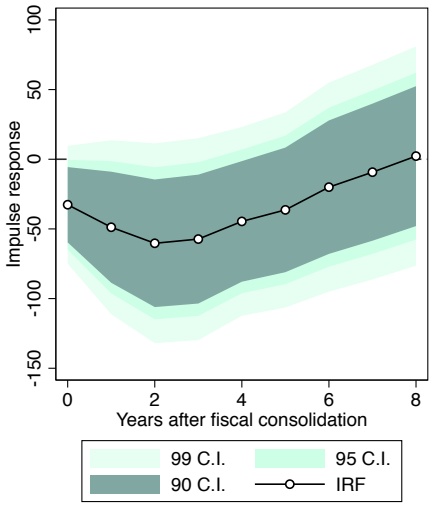
[11]Tables that show the results are available in the Appendix A.

significant in the following year. 1% point of GDP contraction decreases the female employment rate by 0.65. Even though the negative effects are also significant for the male employment rate, they are less significant and lower in size. Especially, after the 4th year the difference between the effects on female and male employment rates are larger. Both employment rates are significantly affected from the fiscal consolidation in the beginning of the 8-year period. The difference between the effects is driven by the effect on female employment rate which is larger and statistically more significant.

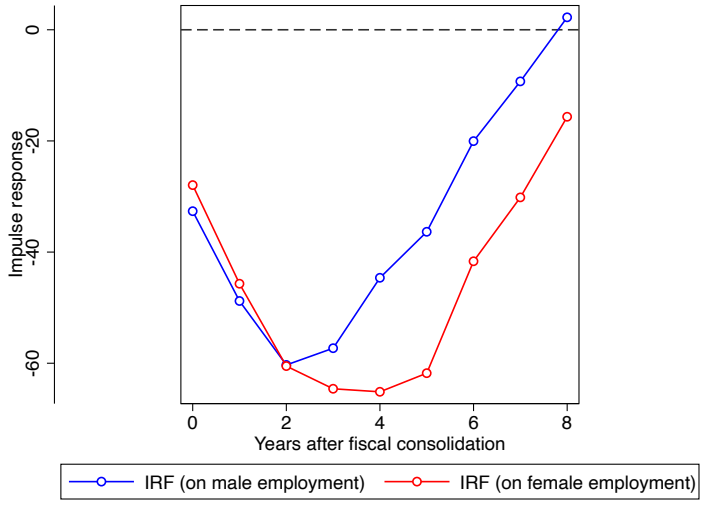
Figure 2.2: The cumulative impact of the size of fiscal consolidation on female and male employment rates, with two-way fixed effects



(a) on female employment rate



(b) on male employment rate



(c) on both employment rates

Below, I present the effects of the size of tax based and spending based fiscal consolidation on the ratio of female employment rate to male employment rate. The local projections for tax based fiscal consolidation is

$$er_{c,t+h} - er_{c,t} = \beta_1 TFC_{ct} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.6}$$

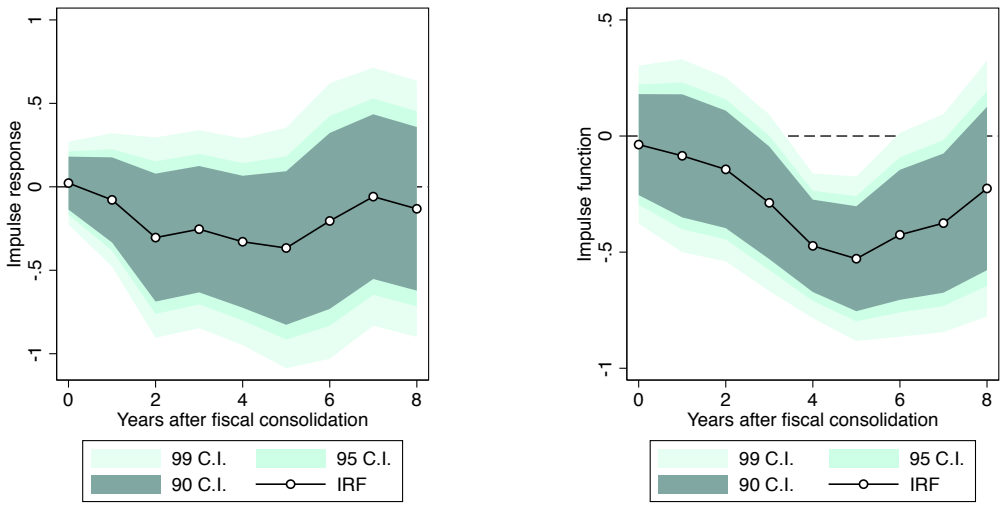
where TFC shows the size of tax based fiscal consolidation. The local projections for spending based fiscal consolidation is

$$er_{c,t+h} - er_{c,t} = \beta_1 SFC_{ct} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.7}$$

where SFC shows the size of spending based fiscal consolidation.

Figure 2.3 shows the cumulative impact of the size of tax based fiscal consolidation and spending based fiscal consolidation. The coefficient for the size of fiscal consolidation is not statistically significant in the 8-year period after the fiscal consolidation. When the fiscal consolidation is spending-based, the effects are more significant in the middle of the 8-year period which is similar to the overall effect. Specifically, spending based fiscal consolidation has a disproportionate effect on female employment rate from 3 years to 7 years after the fiscal policy change, and 1% point of GDP contraction decreases the ratio of employment rates up to %0.564 point. The results are consistent with the literature and the hypothesis. The disproportionate effect is driven by spending-based fiscal consolidation. Budget cuts affect public services more, which can be both a demand and a supply channel because women both need and are employed in public services more.

Figure 2.3: The cumulative impact of the size of tax-based and spending-based fiscal consolidation on the female to male employment rate ratio



(a) tax-based

(b) spending based

2.4.4 Robustness checks

There are some other variables that can affect the relationship between fiscal policies and the ratio of female to male employment rates; such as female labor force participation rate, size of different economic activities or female employment share by different economic activities. These indicators may represent the outcomes of both demand and supply side factors. Results are robust to the inclusion of these variables, and in fact in some cases it strengthens the magnitude or significance of the results.

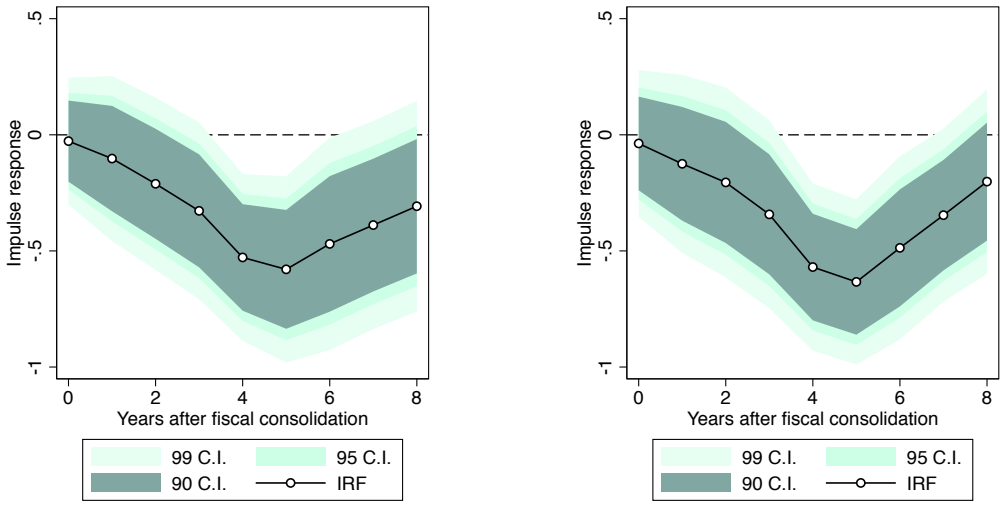
In the absence of comparable time-use data over the entire time period covered by my analysis, I use female labor force participation rates as a control for labor supply

effects. However, it is important to note that female labor force participation might also reflect other factors such as demographics and higher education enrollment as well as unpaid work. The labor force participation rate data comes from International Labor Organization database of labor statistics. The new specification is:

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_2 FLFPR_{ct} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.8}$$

where FLFPR shows female labor force participation rate. Figure 2.4a shows the effect of fiscal consolidation when we control for FLFPR. The effects are larger, and statistically significant from the 3rd year to 7th year after fiscal consolidation.

Figure 2.4: The cumulative impact of the size of fiscal consolidation on the female to male employment rate ratio, robustness checks



(a) with FLFPR

(b) with economic activity

Fiscal consolidation may have distinct effects in countries with different sectoral structures. The following specification includes controls for the relative size of branches of economic activity within the market economy. The unit of measurement is as a percentage of GDP, and the dataset has variables for gross value added in agriculture, service and industry [12]. To avoid colinearity, I only include two variables; gross value added in agriculture and services.

Gross value added in each economic activity data comes from the OECD National Accounts Statistics database. The specification is as follows:

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_{2i} \sum_i EA_{ict} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.9}$$

where EA shows the default category for gross value added in each economic activity. Figure 2.4b shows the effect of fiscal consolidation, controlled for the size of agriculture and service. The results are robust, and fiscal consolidation has a disproportionate impact on female employment between 3rd and 7th year after fiscal consolidation, which is similar when we control for FLFPR.

Further econometric specifications include female employment shares by different economic activity as additional controls. Female employment share as a percentage of total employment in each economic activity data is based on the author's calculation from the data constructed from the International Labor Office (ILO), employment by sex and economic activity database. The shortcoming of this extension of the basic

[12]It is also possible to include subcategories of these economic activities, and present a more detailed variety of economic activities.

specification is that the number of observations does not allow to run the regression with time fixed effects. Thus, I only include country fixed effects to increase degrees of freedom in the following specifications. I present four options for econometric specifications below.

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_2 fshare_{PUBct} + \mu_c + \varepsilon_{ct} \tag{2.10}$$

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_2 fshare_{AGRct} + \mu_c + \varepsilon_{ct} \tag{2.11}$$

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_{2i} \sum_i fshare_{ict} + \mu_c + \varepsilon_{ct} \tag{2.12}$$

where $fshare$ shows female employment share in each economic activity, $i = PUB, AGR, CON$.

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_{2i} \sum_i fshare_{ict} + \mu_c + \varepsilon_{ct} \tag{2.13}$$

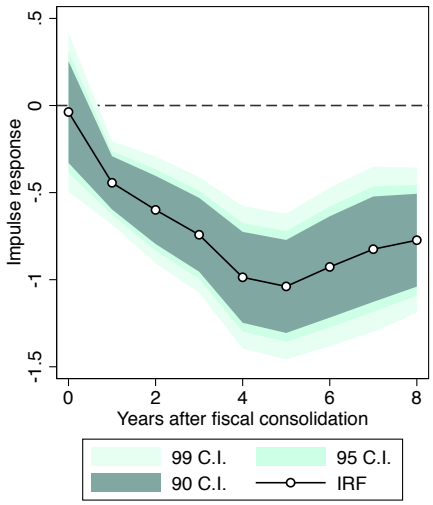
where $fshare$ shows female employment share in each economic activity, and $i = PUB, AGR, CON, MAN, MEL, MKT$[13].

Figure 2.5 shows the results of specifications that include female employment shares in public sector; agriculture; agriculture, construction and public sector; and

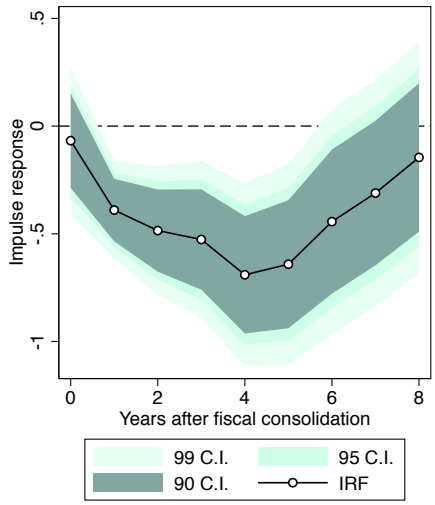
[13]PUB: Public Administration, Community, Social and other services and activities, AGR: Agriculture, CON: Construction, MAN: Manufacturing, MEL: Mining and quarrying: Electricity, gas and water supply, and MKT: Trade, transportation, accommodation, food BA services

all available sectors respectively, in addition to size of fiscal consolidation and country fixed effects. Figure 2.5 a,b, and d show that when we control for the female employment share by different economic activities, fiscal consolidation affects female employment rates disproportionately for the entire 8-year period. Holding the female employment share in different economic activities constant, the results suggest that fiscal consolidation continues to have a disproportionate impact on female employment rate. Thus, broad changes in the structure of employment do not seem to be driving the results.

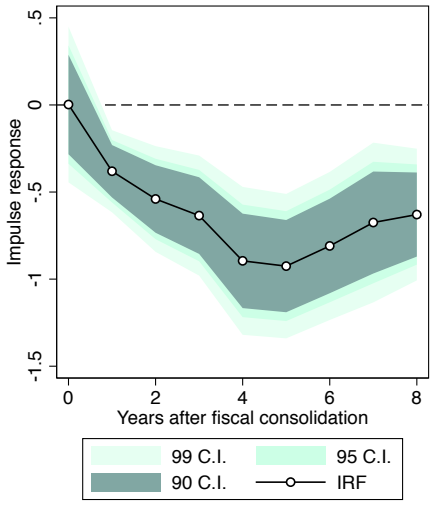
Figure 2.5: The cumulative impact of the size of fiscal consolidation on the female to male employment rate ratio, controlling for female employment share by economic activity



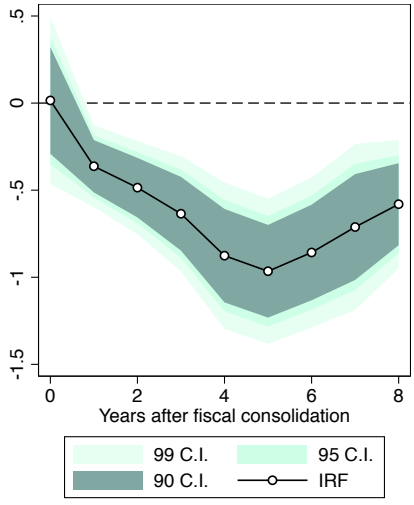
(a) with fshare in public administration



(b) with fshare in agriculture



(c) with female employment share in agriculture, construction and public administration



(d) with female employment share in different activities

The empirical results show that fiscal consolidation, with a motivation of reducing budget deficit, has a disproportionate impact on female employment rate in the 17 OECD countries included in this empirical analysis. The coefficients are especially significant in the middle of the 8-year period examined here. The disproportionate impact appears to be mainly driven by changes in female employment that are a response to spending-based fiscal consolidation. The results are robust to the inclusion of controls for specific demand and supply side factors. These include FLFPR, gross value added and female employment shares in different economic activities.

2.4.5 Work-family policy indicators

As a further extension of the analysis, I control for the role of work-family policy indicators. I gather work-family policy indicators (WFPIs) from the OECD Family Database. I mainly focus on five indicators under 'public policies for families and children' section. They mainly represent leave and childcare policies. I present summary statistics for these indicators in Table 2.6. The number of observations for each variable varies in the dataset. Among these five variables, only two of them has enough data available for the analysis presented in this chapter. These are the indicators of differences in family leave policies. Table 2.7 indicates the average length of leave available to mothers and fathers by country. There is a variation among the countries. United States and Australia do not have any leaves available to mothers. Apart from these two countries, all other countries have at least 14 weeks of leaves available for mothers. Leaves for fathers are either not available or they are very short compared to mothers. Austria has the highest average leaves for

fathers with 9.75 weeks. Australia, Canada, Ireland, Italy, Japan, and the US do not have any leaves available to fathers.

Table 2.6: Summary statistics for work-family policy indicators

	obs	mean	sd	min	max
Total public social expenditure on families as a % of GDP	80	2.51	.899	.9	4.2
Length of maternity and parental leave available to mothers in weeks	544	35.66	36.76	0	161
Length of paid paternity and parental leave reserved for fathers in weeks	544	2.017	5.238	0	28
Proportion of children aged 0-2 enrolled in formal childcare and preschool	21	32.54	10.816	14.9	49.4
Proportion of children aged 3-5 enrolled in preprimary education or primary school	11	86.73	12.893	66.3	100.1
N	544				

Table 2.7: Summary statistics for the length of maternity and parental leave available to mothers, and paid paternity and parental leave reserved for fathers in weeks

	available to mothers		available to fathers		
Country	mean	sd	mean	sd	obs
Australia	0	0	0	0	32
Austria	79.5	19.535	9.75	12.355	32
Belgium	19.47	6.725	5.825	6.866	32
Canada	29.97	14.64	0	0	32
Denmark	37.94	16.814	6.75	8.48	32
Finland	133.31	51.203	2.53	2.724	32
France	20.875	10.31	.5	.88	32
Germany	64.94	30.068	.816	2.576	32
Ireland	14.69	6.088	0	0	32
Italy	47.7	0	0	0	32
Japan	35.5	22.87	0	0	32
Netherlands	15.31	5.245	.9125	4.654	32
Portugal	14.84375	3.34268	1.790625	3.996	32
Spain	15.31	.965	.547	.51	32
Sweden	55.965	6.804	4.425	3.76	32
United Kingdom	20.97	6.47	.44	.84	32
United States	0	0	0	0	32
Total	35.664	36.761	2.017	5.238	544

For the purpose of this study, it may be important to control the results for WFPIs. Following Budig et al. (2012)'s approach, I believe especially two work-family policy indicators can have significant effects on the female employment rate; length of maternity and parental leave available to mothers in weeks, and proportion of children aged 0-2 enrolled in formal childcare and preschool. For the former, data is available for the whole period; however, for the latter, data is available for only a few years and some countries. Therefore, I only focus on leave policies. I test

several specifications below. In the first one, I only include the length of maternity and parental leave available to mothers in weeks.

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_2 leave_{m_{ct}} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.14}$$

where $leave_m$ shows the length of maternity and parental leave available to mothers in weeks. Table 2.8 shows the results. Fiscal consolidation affects female employment rate disproportionately from 3 years 6 years after the fiscal consolidation, and the effect of the leave policy is not significant.

Table 2.8: Results with leave policies 1

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
FC	-0.095	-0.194	-0.300**	-0.490***	-0.542***	-0.419**	-0.332	-0.227
	(0.144)	(0.151)	(0.151)	(0.142)	(0.160)	(0.193)	(0.202)	(0.220)
leave-mothers	0.000	0.000	0.000	0.000	0.000	0.000	0.000*	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Because leave policies may have a non-linear effect on women's employment, in the following specification I use a quadratic term for this indicator. Results are similar to the previous specification, as shown in Table 2.9.

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_2 leave_{m_{ct}} + \beta_3 leave^2_{m_{ct}} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.15}$$

Table 2.9: Results with leave policies 2

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.097	-0.198	-0.304**	-0.491***	-0.542***	-0.416**	-0.324	-0.215
	(0.144)	(0.151)	(0.150)	(0.141)	(0.159)	(0.193)	(0.203)	(0.223)
leave-mothers	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.001	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
sq-leave-mothers	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In the final specification, I include the length of leave available to fathers in addition to the length of leave available to mothers.

$$er_{c,t+h} - er_{c,t} = \beta_1 FC_{ct} + \beta_2 leave_{m_{ct}} + \beta_3 leave_{f_{ct}} + \mu_c + \tau_t + \varepsilon_{ct} \tag{2.16}$$

where $leave_f$ shows the length of paternity and parental leave available to fathers in weeks. Results in Table 2.10 show that fiscal consolidation has a disproportionate impact on female employment when controlled for the leaves available to mothers and fathers.

Table 2.10: Results with leave policies 3

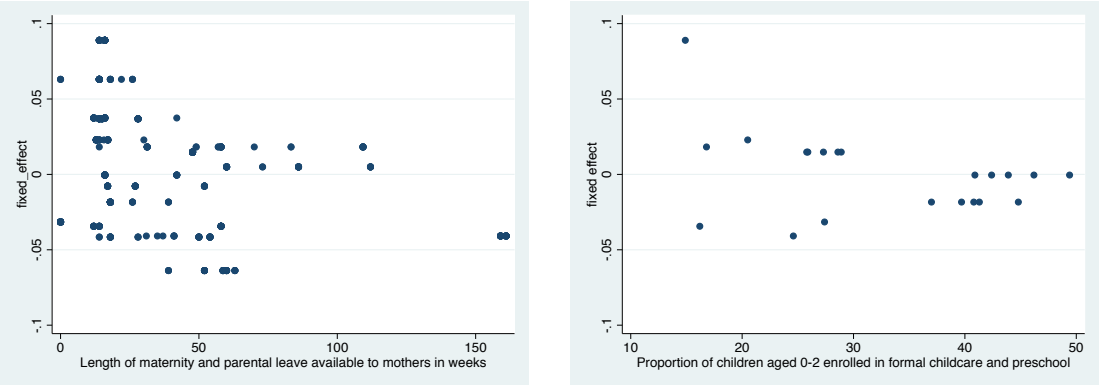
	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.123	-0.248*	-0.357**	-0.534***	-0.575***	-0.442**	-0.353*	-0.246
	(0.138)	(0.141)	(0.141)	(0.138)	(0.159)	(0.192)	(0.201)	(0.220)
leave-mothers	0.000	0.000	0.000*	0.000*	0.000*	0.000*	0.000*	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
leave-fathers	-0.000*	-0.001**	-0.001**	-0.001*	-0.001	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The impact of fiscal consolidation on the ratio of employment rates is robust to the inclusion of controls for leave policies. In these regressions, the estimates of coefficients on the leave policy variables are close to zero, and they are not statistically significant (except from the last specification). The possible reason is that effects of leave policies might be captured by fixed effects. To see if this is the case, I obtained the fixed effects from the benchmark model. Fixed effects have a moderate correlation with the length of leaves available for mothers (-0.3432), suggesting that the effects of leave policies might be partially captured by fixed effects. Similarly, fixed effects have a moderate correlation with the proportion of children aged 0-2 enrolled in formal childcare and preschool (-0.3744). Figure 2.10 shows the relationship between country fixed effects and these WFPIs (the length of leaves available for mothers, and the proportion of children aged 0-2 enrolled in formal childcare and preschool).

Figure 2.6: The relationship between fixed effects and WFPIs



(a) Length of maternity and parental leave available to mothers in weeks

(b) Proportion of children aged 0-2 enrolled in formal childcare and preschool

2.5 Conclusion

The narrative approach allows the analysis of fiscal consolidation, with a motivation of reducing budget deficits. The results presented here suggest that fiscal consolidation disproportionately affects the female employment rate in the period of 3 years to 5/6 years after the policy change. The disproportionate effect is driven by the effect on female employment rate. The results show that discretionary contractionary fiscal policy usually decreases female employment rates more than male employment rates or male employment rates recover faster than female employment rates. Spending-based fiscal consolidation leads to a disproportionate impact on female employment rate while tax-based consolidation does not have a significant effect. Cuts in government expenditure affect female employment more. This effect of spending-based fiscal consolidation is consistent with the literature.

The results are robust when we control for FLFPR, and the size of economic activities. When we keep female employment shares in different economic activities constant, fiscal consolidation affects female employment rate disproportionately across the entire period. The effect is not driven by the female employment share in broadly classified economic activity branches. Work-family policies affect the impact of fiscal consolidation; however, there is not enough data to test different work-family policies as a channel. Therefore, it is not possible to draw a firm conclusion regarding the effects of work-family policies. 'Can work-family policies explain the disproportionate impact of fiscal consolidation on female employment'? is a further research question.

These findings suggest that the gender implications of fiscal policy choices may change, depending on the policy. Policy makers should be aware of the fact that fiscal consolidation decreases employment rates with a larger effect on female employment rate, and the effects persist for several years. Contractionary macroeconomic policies have negative employment outcomes in general but it also creates unequal outcomes for women and men. Policy makers could address this inequality with other policies that aim gender-equality.

There is need for more research on gender implications of fiscal policies. A further research could address the impact of discretionary fiscal expansion on gender disaggregated employment rates because expansionary and contractionary policies can affect different economic activities or they may have different effect on female labor supply. Although, fiscal consolidation appears to have a disproportionate negative impact on female employment for several years, the effect of fiscal expansion might

be different than fiscal contraction. In addition, further research could investigate the effect of fiscal policy on female time use for care work for a specific country or several countries if the time use data is available and consistent among countries. In further research, it will be useful to control for monetary policy choices when looking at the impact of fiscal policy.

CHAPTER 3

THE IMPACT OF INFLATION REDUCTION POLICIES ON FEMALE AND MALE EMPLOYMENT RATES

3.1 Introduction

For many central banks, maintaining price stability became the main target of monetary policy, to the neglect of other targets such as employment creation. However, unemployment still remains an important problem, particularly with regard to unequal labor market opportunities between men and women. Recent research has shown that inflation reduction policies have disproportionate effects on women's employment. This essay contributes to this literature by examining the dynamic effects of inflation reduction policies on female and male employment rates, and the ratio of employment rates up to 8 quarters.

In this essay, I examine whether inflation reduction policies had a disproportionate impact on female employment in 23 European countries[1] belonging to the Organization for Economic Co-operation and Development (OECD-Europe) between 1998-2018 by using a local projections methodology with quarterly country level panel data. I use two empirical strategies. First, I look at the impact of short-term

[1]Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, Turkey

interest rates, as a proxy for the monetary policy rate, on gender-disaggregated employment rates. Second, I analyze the changes in female and male employment rates, and their ratio during inflation reduction episodes.

Results suggest that short-term interest rates, as a proxy for monetary policy rate, have statistically significant negative impact on both female and male employment rates. However, short-term interest rates do not have any statistically significant gender effect on the ratio of employment rates. When we keep the female employment shares by broadly defined economic activities constant, findings suggest that short term interest rates affect female employment rates disproportionately at the end of this eight-quarter period. On the other hand, the impact of inflation reduction episodes, on female and male employment rates, and on the ratio is not statistically significant for majority of the period. The rest of this essay is structured as follows. Section 2 presents the findings of studies in the literature that have similar research questions. In section 3, I discuss contractionary monetary policy and the gender differences in the labor market and non-market work. Section 4 discusses the empirical strategy, data, findings and a robustness check. Finally, Section 5 concludes.

3.2 Literature Review

The impact of monetary policy on women's employment is still a fairly new research area for macroeconomics and feminist economics. The main research papers on this field are Abell (1991); Braunstein and Heintz (2006); Takhtamanova and Sierminska (2009); and Seguino and Heintz (2010). Although they do not ask the

exact same questions, papers by Berument et al. (2005, 2008) are also related to this research area.

Abell (1991) indicates that the distributional effects of monetary and fiscal policy on unemployment are neither gender-neutral nor race-neutral. He focuses on the periods 1974-1980, and 1980-1987 in the U.S. and uses a VAR methodology. He finds that white males benefit more from the macroeconomic policy choices made. Based on his results, black females were the other group that benefited significantly. Abell (1991) explains this by black female's higher educational achievement relative to their male counterparts and businesses' minority hiring plans. Because of polarized job markets, racial and gender unemployment rates are not identical. Women, minorities and youths are employed in less stable jobs than white males.

Braunstein and Heintz (2006) explore the linkages between monetary policies and gender equality in employment outcomes in their research. They emphasize the disproportione effects of inflation reduction on female employment. In addition, they examine the question: 'how are monetary policy indicators connected to gender-specific employment effects'? They examine the relationship between inflation reduction policies and men and women's formal employment for 51 'inflation reduction periods' between 1970 and 2003 in 17 low and middle-income countries. They apply a Hodrik-Prescott filter to the employment series in their estimation in order to estimate the long-run employment trends. Their results show that contractionary monetary policy has disproportionate negative effects on women's employment. On the other hand, maintaining a competitive exchange rate can help to reduce this

impact. For non-contractionary monetary policy periods, they do not find a strong relationship between policy instruments and women's formal employment.

Takhtamanova and Sierminska (2009) investigate whether the policies for reducing inflation affect women's unemployment disproportionately in nine OECD countries between 1980 and 2004, using quarterly data. Those countries are Canada, Finland, Italy, Japan, Norway, Spain, Switzerland, the US, and the UK. They use single equation regression and vector autoregression analysis methodologies for economy-wide, and sectoral analysis. They conclude that the link between the short-term interest rate and employment is weak for the industrial countries that they researched, and the impact of interest rates does not vary by gender.

Seguino and Heintz (2010) focus on the impacts of contractionary monetary policy on gender and race in the US from 1979-2008. They use the federal funds rate, the interest rate on overnight loans between banks, as the indicator of contractionary monetary policy. In their paper, they examine the impact of the federal funds rate on the relative unemployment rates of white and black women and men. According to their results, monetary policy is neither gender nor race neutral. Unemployment, as a result of contractionary monetary policy, affects black and white women more negatively than white men. Moreover, black women experience a greater burden than white women.

Berument et al. (2005) focus on the effects of the exogenous shifts in income and monetary policy on overall unemployment rate and the unemployment rate by different levels of education by gender in Turkey for the period from 1988:01 to 2003:04. Most of their findings are similar across gender. Exchange rates only affect total

and female high school unemployment. Berument et al. (2008) look for the effects of the indicators of macroeconomic policy shocks; real GDP, price level, exchange rates, interbank interest rates, and the money supply on total unemployment and unemployment by branch of economic activity for the period from 1988:01 to 2004:04 in Turkey. Their results show that the exchange rate and the interbank interest rate innovations do not have any statistically significant effects on unemployment by economic activity except for in manufacturing (both innovations have positive impact) and finance-insurance sectors (only the exchange rate innovation has positive impact).

The empirical literature therefore has still not reached a firm conclusion on the existence of gender bias from contractionary monetary policy. While Braunstein and Heintz (2006) finds this relation for low and middle income countries, and Seguino and Heintz (2010) for the US; Takhtamanova and Sierminska (2009) cannot find a strong relationship for nine OECD countries. The contribution of this paper is to examine dynamic effects of inflation reduction policies on female and male employment rates, and investigate whether these policies have gender biases in terms of employment outcomes for 23 OECD-Europe countries. In addition, I use two empirical strategies to examine the impact of inflation reduction policies. The first one is to look at the impact of short-term interest rate, a proxy for the policy interest rate which is a tool of monetary policy. The second one is to identify inflation reduction episodes, and look at the changes in gender-disaggregated employment rates in these periods. My results do not provide consistent evidence that a gender bias exists,

though I do find some confirmation in specifications controlling for sectoral female employment shares.

3.3 Conceptual Framework

I discuss the conceptual framework for this essay in two subsections. The first one discusses growth and employment outcomes of contractionary monetary policy. The second subsection addresses gender differences in the economy, and possible channels that can explain the gender bias of inflation reduction policies.

3.3.1 Contractionary Monetary Policy and Employment

Unemployment is a significant economic problem, and might lead to other economic problems such as stagnant aggregate demand, output loss and greater inequality. Thus, reducing unemployment has been an important goal of macroeconomic policies. As a part of macroeconomic policy, monetary policy, administered by central banks, could also target employment creation. Moreover, many central banks in the post-Second World War period conducted monetary policy to support development policies(Epstein, 2007, p. 2).

However, since the 1980s, developmental outcomes or lowering unemployment has not been the primary objective of monetary policies for a wide range of countries. Instead, reducing inflation became one of the most important goals. The main policy goal of central banks of the countries adopting inflation targeting has been to maintain price stability.

In mid-1960s and 1970s, inflation emerged as a growing concern for many Western economies (Sargent, 1982, p.41). Therefore, after this period, inflation reduction policies gained prominence in a lot of countries. The first country that adopted inflation targeting was New Zealand in 1990. Advocates of these policies argued that high inflation causes long-run damage to real economic performance, so stable growth and employment is consistent only with very low and stable inflation (Epstein and Yeldan, 2008, p. 3). Because of the influence of these arguments, the primary objective of monetary policy became maintaining price stability.

However, other economic problems are also as significant as inflation. Akyuz (2006, p.46) (cited by Epstein and Yeldan, 2008, p.5) mentions that the main challenge of macroeconomic policy is unemployment and financial instability, not inflation. Furthermore, stable inflation might not be dangerous unless it raises to very high levels. Research suggests that inflation up to 20% does not create problems in terms of growth, investment, foreign direct investments or other real variables (Epstein, 2007, p. 7). These inflation reduction policies dominates other macroeconomic goals, such as reducing unemployment or promoting growth. In this respect, unemployment and informalization are the opportunity costs of lower inflation (Jayadev, 2009, p.75). Ball (1997) shows that the reason of rising unemployment during the 1980s is the tight monetary policy that aimed to lower inflation.

Inflation targeting policies have not been entirely successful. The main objectives of these policies are to reduce the rate of inflation, to enhance the credibility of

monetary policy, to reduce the sacrifice ratio[2] associated with contractionary monetary policy, and to help to attract foreign investment (Bernanke and others (1999), Mishkin and Schmidt-Hebbel (2001) and Roger and Stone (2005) (cited by Epstein, 2007, p.4)). However, inflation targeting could neither enhance the credibility of monetary policy nor reduce the sacrifice ratio (Bernanke and others, 1999, and Epstein, 2000, (cited by Epstein, 2007, p.4)). Tight monetary policy is used in order to keep inflation in the low single digits, by using short-term interest rates as tool. Contractionary monetary policy reduced the inflation rate; however, it did not result in expected gains in economic growth or employment (p. 1-7 Epstein, 2007; Epstein and Yeldan, 2008, p. 8). Epstein and Yeldan (2008) observe a rise in unemployment for the post inflation-targeting period. In terms of the trade balance, there are countries that improved their trade surplus and countries that maintained large deficits. After adopting inflation targeting, there was general trend towards exchange rate appreciation for most countries caused by the expansion of foreign capital inflows.

In the inflation targeting regime, monetary policy focuses on 'setting the policy interest rate'. The exchange rate is left to the global financial markets, and a 'floating/flexible' exchange rate system is implemented. According to the structuralist macroeconomic tradition, it is important to have a stable and competitive real exchange rate because it influences employment and economy in general (Epstein and Yeldan, 2008, p. 15-16). In my empirical analysis, I look at the different cases with

[2]Ball (1997) defines sacrifice ratio as the ratio of the loss in output to the fall in trend inflation.

and without competitive exchange rates in order to see if it changes the impact of inflation reduction policies on employment.

OECD European countries also follow inflation reduction policies. The European Central Bank (ECB) applies a single monetary policy for every Eurozone member country. These countries constitute a large part of my data sample. The primary objective of ECB is to maintain price stability. The central banks of countries in the rest of my sample also have the same primary goal. They are all inflation-targeting countries. For example, for central banks of most countries (ECB and Sweden), the target is below 2%, and for Iceland and Norway, it is below 2.5%. The exact target rate differs among countries. Most countries decide the short-term interest rate (the central bank policy rate) to achieve this purpose. However, Denmark maintains price stability through both monetary and the exchange rate policy.

Similar to most of the world, OECD European countries also have a well-defined separation between economic policy responsibilities. Central banks are responsible for keeping the inflation rate low, and they are not directly responsible for other policy targets. Although the ECB and the Central Bank of Czech Republic (CNB) state that they support the general economic policies leading to sustainable growth, full employment and balanced economic growth, the primary objectives of the ECB and the CNB are still the same: maintaining price stability, which is hierarchically privileged to other objectives.

In the Eurozone, each member country decides their fiscal policies even though they are subject to the Maastricht Treaty; however, they follow the single monetary policy applied by ECB. The Eurozone's single monetary policy may not work iden-

tically for all countries. This can result in unexpected or undesired consequences for other economic objectives. These countries do not have the same policy space available to them to use independent fiscal and monetary policies as macroeconomic management tools.

Macroeconomic policies sometimes reflect the economic interests of particular social groups based on class, gender, or race. In other words, macroeconomic policies have distributional effects. Resent research show that contractionary monetary policy has also distributional effects on different groups (Jayadev, 2009; Abell, 1991; Seguino and Heintz, 2010). Workers are more influenced by negative impacts of higher unemployment, and capitalists are more affected by higher inflation negatively. Therefore, workers are unemployment averse while capitalists are inflation averse (Jayadev, 2009, p. 72). Moreover, we can observe these different distributional effects in terms of race and gender. For example, black men and both black and white women are disproportionately influenced by contractionary monetary policy in the United States (Abell, 1991; Seguino and Heintz, 2010). This paper also aims to observe if there is such a distributional impact of inflation reduction policies in terms of gender in 23 OECD-Europe countries.

3.3.2 Gender Aspect of Monetary Policy

There are several reasons that we would expect to observe gender differences in economic outcomes. One of the explanations for the gender differences in the economy is the sexual division of labor. The sexual division of labor both includes the pattern of work allocation between women and men, and the social practices

which classify some works as suitable for women but unsuitable for men, or suitable for men but unsuitable for women (Elson, 1995b, p.3).

We can observe the gender inequality in the economy as the segregation of women in specific occupations. In sub-Saharan Africa and Southern Asia, women are primarily employed in the agricultural sector as unpaid family workers. In other economies, women are usually concentrated in the service sector (UN 2000:114, (cited by Elson, 2007, p. 5-6). The service sector is also segregated. Women work in community, social and personal services, while men work in financial and business services. In industry, women are primarily engaged in food processing, textile, and garment production (ILO 2004: 12, (cited by Elson, 2007, p. 6)). Moreover, women tend to be concentrated in informal work more than men.

Takhtamanova and Sierminska (2009, p.325-327) discuss the reasons that can cause the different effects of interest rates on female and male unemployment rates. The reasons they give are employment and occupational segregation, gender differences in labor market attachment, job tenure, and discrimination. They state that empirical evidence shows that women and men work in different fields of employment, and women work in a narrower range of occupations in the labor market. They have different accesses to labor market attachment because of their different roles in the care economy. Women are less likely to be employed full-time, and they have shorter job tenure.

Employer preference is also a factor in gender discrimination. Employee's and employer's preference can be interrelated. Because of employer's reluctance to hire women, women may not be motivated to compete with men in some occupations

(Mandel and Semyonov, 2006, p. 1917). Employer's preference may also cause added-worker effect; women are usually considered as a source of cheap labor so employers in labor-intensive sectors employ women to raise their profits.

Inflation reduction policies can affect some sectors more than others. This relationship can work through both interest rates and exchange rates. It is important to test if female intensive sectors are more interest rate sensitive. If this is the case, inflation reduction policies may affect female intensive sectors more through interest rate channel. On the other hand, as Heintz (2006) mentions increasing the policy interest rate can cause appreciation of real exchange rate. This can influence employment in export sectors; and in many economies, women may be disproportionately employed in labor-intensive, competitive export activities. Therefore, it is also possible that contractionary monetary policy affects female employment through an exchange rate channel.

Sectoral impacts are one part of the story. However, there can also be other channels to explain this disproportionate impact on employment. Seguino and Heintz (2010) make robustness check with education and sectors for their analysis. Even though they find that education and sector also have effect on different unemployment rates of women and men, the coefficient on the policy interest rate is still negative and statistically significant. Women are usually employed in the precarious forms of employment, and in case of an economic downturn, they tend to be discharged first (Seguino and Heintz, 2010, p.1). There can also be additional channels to explain this relationship. In the empirical part, I perform a robustness check with the female employment shares in broadly defined economic activity branches to test if labor

market segregation has any role in the distinct effects of inflation reduction policies on female and male employment rates.

Economic downturns are usually not gender neutral. This gender impact of economic downturns are apparent in various ways. Recessions can generate a discouraged-worker effect or an added-worker effect for women. Economic downturns can occur as a result of economic crises, austerity policies, budget cuts, or contractionary monetary policy. This essay focuses on inflation reduction policies. The type of policy can also determine the gender specific effects; discouraged-worker effect or added-worker effect.

Macroeconomic policy changes may have direct effects on female paid employment, but they may also have indirect effects on unpaid work through the change in paid employment. Increases in paid employment may increase the bargaining power of women within households so their unpaid work time can decreases. On the other hand, sometimes unpaid work is not influenced by the change in paid employment rates. In these cases, increases in paid employment may increase the burden of women by raising total work time. Although more research is required about impacts on both the paid employment and unpaid work of women, in this essay I focus on paid employment because data is available to look at gender disaggregated differences over time in contrast to data on unpaid work.

As discussed in the model of the first essay, there are different channels of macroeconomic policies that can yield differential employment outcomes for men and women. The model presents three of them. First, women are usually employed in the labor-intensive sectors so aggregate demand shocks might affect them more than the em-

ployees in other sectors. Second, capacity utilization in female and male-dominated sectors might respond to aggregate demand shocks differently. The sector, in which capacity utilization responds to aggregate demand shocks more, would be affected more. The last channel in the model is that female employment can be affected through the burden of unpaid work, which is harder to empirically test for the cross-country analysis. Depending on the response of capacity utilization in male and female-dominated sector, these channels might have similar or different gender biases. If capacity utilization in male dominated sectors reacts to monetary policy shocks more, the overall effect might be uncertain.

3.4 Empirical Analysis

3.4.1 Methodology

I use Jorda (2005)'s local projections technique to estimate dynamic effects of inflation reduction policies on gender disaggregated employment rates. As I mentioned in the previous chapter, this method has some advantages as a flexible method to estimate dynamic effects. I use quarterly panel data for 23 OECD-European countries between 1998-2018. The fixed effect panel data approach allows to have time and country fixed effects so I can compare different structured countries.

In this paper, I have two empirical strategies to examine the impacts of inflation reduction policies on female and male employment rates separately, and on the ratio of female to male employment rates. The first strategy is to look at the impact of short-term interest rates as a proxy for policy interest rates. Policy makers increase the policy interest rate to reduce inflation. Short-term interest rates are endogenous

to some macroeconomic variables. To avoid this problem, I include lagged versions of several control variables; GDP growth, inflation, and real effective exchange rate. I try several specifications with these variables. There are some limitations to this strategy. The control variables might not be enough to account for all endogeneity.

The second strategy is to identify the inflation reduction periods. I apply the following methodology to decide the periods for policy application. Following the methodology of Ball (1994), and Braunstein and Heintz (2006), I identify the deflationary periods in each country, and then I examine if these periods are a response to a monetary policy instrument. However, there are some small differences in the calculation of these episodes. Inflation data is derived from consumer prices for all items, and it shows the percentage change on the same period of the previous year. I use moving averages of consumer prices to obtain trend inflation. I take the average of seven quarters; including the three previous quarters and the three subsequent quarters. Similar to Ball (1994)'s identification, a peak exists if its value is higher than the previous four quarters' and the following four quarters' trend inflation, and a trough exists if its value is lower than four quarters' trend inflation on each side. The deflationary periods are identified by the periods between peaks and troughs. Moreover, the deflationary episodes should be large enough (mostly at least two points depending on the standard deviation of the trend inflation in each country). If there is an increase in the short-term interest rate before these periods, I label these periods as inflation reduction episodes, and use it as the dummy variable for the main independent variable in the analysis. I specify 57 periods as inflation

reduction episodes for 23 countries. Table 3.1 shows identified inflation reduction episodes.

Table 3.1: Inflation Reduction Episodes

Country	Inflation Reduction Episodes
Austria	2001q2-2003q2, 2008q2-2009q4, 2012q1-2015q4
Belgium	2001q3-2003q2, 2008q3-2009q4, 2011q4-2014q3
Czech Republic	2008q2-2010q1
Denmark	2000q3-2004q3, 2008q4-2009q4, 2011q3-2015q4
Estonia	2001q3-2003q2, 2008q2-2009q4 , 2011q4-2015q3
Finland	2001q1-2004q2, 2008q2-2009q4, 2012q1-2015q4
France	2008q2-2009q4, 2012q1-2015q3
Germany	2008q1-2009q4, 2012q2-2015q4
Greece	2008q2-2009q2, 2011q1-2014q3
Hungary	2004q2-2005q4, 2007q4-2011q1, 2012q2-2014q4
Iceland	2009q2-2011q2, 2012q3-2015q3
Ireland	2001q1-2004q3, 2007q4-2009q4, 2012q1-2015q3
Italy	2008q2-2009q4, 2012q2-2015q4
Luxembourg	2008q2-2009q3, 2012q1-2015q3
Netherlands	2002q1-2004q4, 2008q4-2010q1, 2013q1-2015q4)
Norway	2000q4-2004q3, 2009q1-2012q2
Poland	2005q1-2006q2, 2009q1-2010q1, 2012q1-2015q4
Portugal	2001q4-2004q4, 2006q4-2009q3, 2012q1-2014q2
Slovak Republic	1999q4-2002q2, 2004q1-2005q4, 2008q3-2010q1, 2012q2-2015q4
Slovenia	2008q2-2010q1, 2012q4-2015q2
Spain	2008q2-2009q4, 2012q1-2015q3
Sweden	2008q2-2009q4, 2011q3-2014q4
Turkey	2008q2- 2010q2, 2012q4-2013q2

If the country is in an inflation reduction episode, I assign a value of 1 to the variable, and 0 otherwise. I use the dummy variable for inflation reduction episodes as the main independent variable. This approach is relevant because it makes it easier to compare the inflation reduction episodes to other periods, and it can provide a better understanding of implications of the policy instrument. However, the variable that

represents inflation reduction episodes might still correlate with other macroeconomic variables. Thus, I control the results for the inclusion of GDP growth and REER in addition to presenting the raw effects of inflation reduction episodes.

3.4.2 Data

I use quarterly data for the period from 1998 to 2018 for 23 OECD-European countries[3]. Because data is not available for the whole period, I perform an unbalanced country-level panel data analysis. My data sources are mainly the Organization for Economic Cooperation and Development (OECD) datasets and the International Labor Organization (ILO) datasets. For employment rates of women and men, inflation, short-term interest rates, real effective exchange rate, and GDP growth; I prefer OECD Short-Term Labor Market Statistics, OECD Main Economic Indicators (Consumer Prices), OECD Monthly Monetary and Financial Statistics (MEI), OECD Economic Outlook, and OECD National Accounts Statistics, respectively. In the OECD data, the employment rate is calculated as the ratio of the employed to the working age population. Real effective exchange rate represents countries' price competitiveness, and is expressed as national currency per US dollar. In addition, I calculate female employment share in broad economic activity categories from quarterly ILO data for employment by sex and economic activity, seasonally adjusted. There are a total of 1,606 observations across all variables[4].

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[3]Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, Turkey

[4]Summary statistics for variables is available in the appendix.

Figure 3.1 shows the average female and male employment rates for each country. Iceland has the highest average employment rates. While Turkey has the lowest average female employment rate, Poland has the lowest average male employment rate. Male employment rates are higher than female employment rates in all countries.

Figure 3.1: Average female and male employment rates (as a percentage) by country

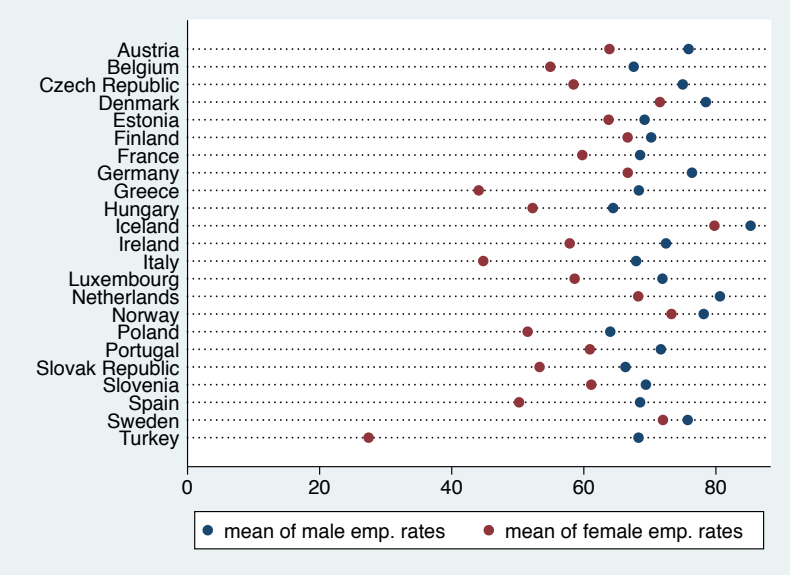
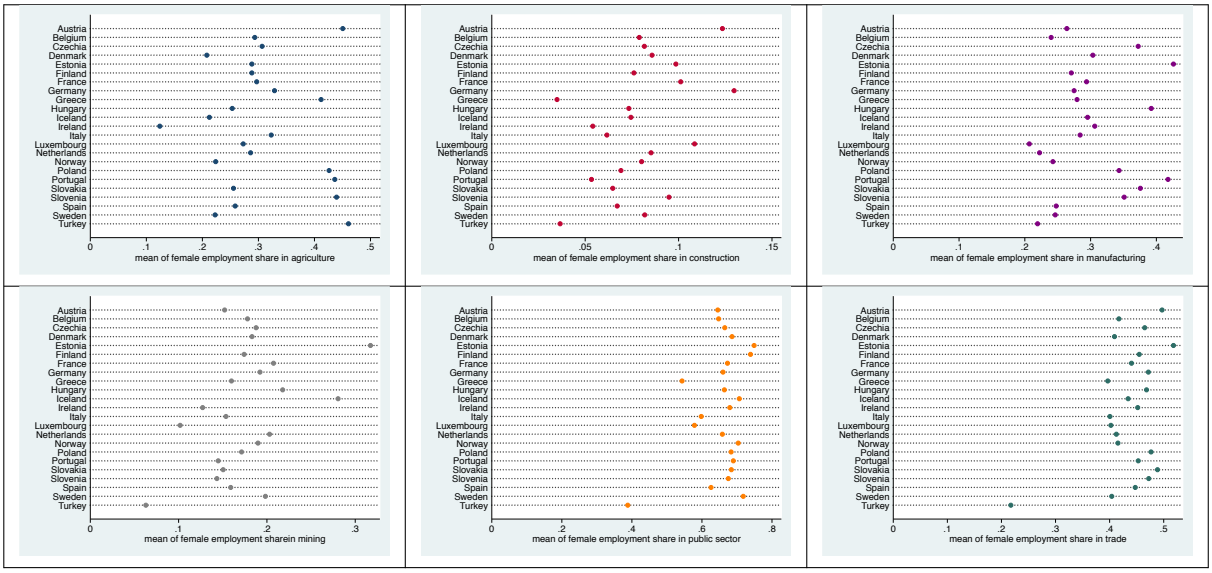


Figure 3.2 presents the average female employment share in different economic activities by country. In general, women's share of paid employment is highest in the public sector, and lowest in construction. There are exceptions, such as Turkey and Luxembourg. In Turkey, the average female employment share is the highest in agriculture. In Luxembourg, the lowest average female employment share is in mining. Except from public sector and a few countries in trade, average female employment share is lower than male employment share.

Figure 3.2: Average female employment share in different economic activities by country



3.4.3 Results

3.4.3.1 The impact of short-term interest rates on employment rates

In this section, I present the results for my analysis of the impact of short-term interest rates on female and male employment rates. Policy makers take other macroeconomic indicators into account when determining the policy rate, so it is not independent from these indicators. Thus, the results need to be controlled for inclusion of these macroeconomic variables. Specifications in this section includes the following control variables: GDP growth, real effective exchange rate (REER), and inflation. I assume that these control variables are predetermined and include them with a one quarter lag. The benchmark specification is as follows:

$$er_{c,t+h} - er_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \beta_{4h} inflation_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{1a}$$

where i represents short-term interest rates, μ is country fixed effects, τ is time fixed effects, and ε is the error term. er stands for the ratio of employment rates (female to male), and $er_{c,t+h} - er_{ct}$ shows the accumulated change from time t to t+h. β_{1h} shows the impulse response in horizon h. The horizon is defined in terms of the number of quarters after a change in short-term interest rates. Table 3.2 shows the results. After controlling for the macroeconomic variables, the results suggest that changes in the short-term interest rate do not have any gender effect on the ratio of employment rates.

Table 3.2: The impact of short-term interest rates on the ratio of employment rates (f/m)

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
interestrate	0.000	0.000	0.000	-0.000	-0.000	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
L.gdpgrowth	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.REER	0.008	0.013*	0.020***	0.025***	0.030***	0.035***	0.042***	0.048***
	(0.005)	(0.007)	(0.007)	(0.008)	(0.009)	(0.010)	(0.011)	(0.011)
L.inflation	0.000	0.000	0.001	0.001**	0.002**	0.002**	0.002**	0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The following specifications examine the impacts on each set of employment rates separately; specification 1b estimates the effect on female employment rates while specification 1c does the same for male employment rates.

$$fer_{c,t+h} - fer_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \beta_{4h} inflation_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \quad \text{(1b)}$$

where $fer_{c,t+h} - fer_{ct}$ shows the accumulated change from time t to t+h for female employment rates. Table 3.3 shows the estimated coefficients based on this specification. The impact of short-term interest rates on female employment rates are statistically significant at 1% level. 1% increase in the short-term interest rates leads to a 0.09-0.251 decline in female employment rates. The size of negative impact increases in each quarter. The specification with the accumulated change in male employment rates as the dependent variable is:

$$mer_{c,t+h} - mer_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \beta_{4h} inflation_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \quad \text{(1c)}$$

where $mer_{c,t+h} - mer_{ct}$ shows the accumulated change from time t to t+h for male employment rates. Table 3.4 shows the estimates based on this specification. Short-term interest rates have statistically significant negative effect on male employment rates for the whole 8-quarter period similar in sign to female employment rates.

Table 3.3: The impact of short-term interest rates on female employment rates

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
interestrate	-0.090***	-0.123***	-0.156***	-0.190***	-0.212***	-0.231***	-0.249***	-0.251***
	(0.023)	(0.029)	(0.033)	(0.038)	(0.042)	(0.046)	(0.051)	(0.056)
L.gdpgrowth	0.063***	0.078***	0.094***	0.104***	0.109***	0.111***	0.101***	0.096***
	(0.013)	(0.017)	(0.020)	(0.024)	(0.027)	(0.030)	(0.033)	(0.036)
L.REER	-0.393	-0.773	-1.060*	-1.544**	-2.031***	-2.426***	-2.752***	-3.106***
	(0.390)	(0.489)	(0.549)	(0.608)	(0.696)	(0.790)	(0.854)	(0.921)
L.CPI	-0.021	-0.036	-0.059*	-0.079**	-0.106**	-0.133***	-0.157***	-0.180***
	(0.021)	(0.028)	(0.032)	(0.036)	(0.043)	(0.051)	(0.059)	(0.063)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.4: The impact of short-term interest rates on male employment rates

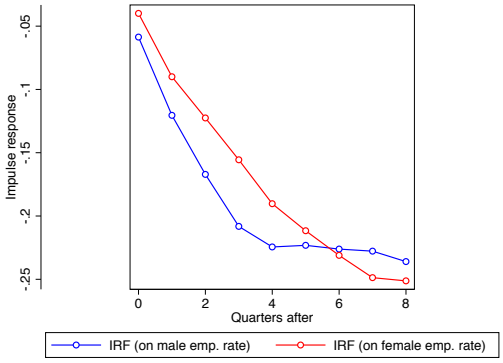
	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
interestrate	-0.120***	-0.167***	-0.208***	-0.224***	-0.223***	-0.226***	-0.228***	-0.236***
	(0.028)	(0.041)	(0.052)	(0.059)	(0.067)	(0.075)	(0.082)	(0.086)
L.gdpgrowth	0.091***	0.116***	0.127***	0.129***	0.124***	0.113**	0.094*	0.077
	(0.022)	(0.030)	(0.036)	(0.042)	(0.046)	(0.048)	(0.052)	(0.055)
L.REER	-1.244***	-2.100***	-3.034***	-4.086***	-5.092***	-6.050***	-7.083***	-7.959***
	(0.431)	(0.581)	(0.717)	(0.841)	(0.967)	(1.088)	(1.192)	(1.256)
L.CPI	-0.050*	-0.093**	-0.134***	-0.189***	-0.254***	-0.309***	-0.356***	-0.390***
	(0.026)	(0.039)	(0.051)	(0.062)	(0.075)	(0.088)	(0.096)	(0.099)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 3.3 compares the estimated impact of short-term interest rates on female and male employment rates. The red and blue curves show impulse response functions for specification 1b and 1c. The horizontal axis indicates the quarters after the change in the short-term interest rate, and the vertical axis indicates size of the impulse response. The sizes of the impacts are similar in magnitude. While the impacts on male employment rates are larger until the 6th quarter, the impacts on female employment rates are larger afterwards. However, the difference is not statistically significant.

Figure 3.3: The impact of short-term interest rates on female and male employment rates



Below, I present specifications with different combinations of control variables. Figure 3.4 presents the impact of short-term interest rates on female and and male employment rates, and the ratio of employment rates across all of the specifications. Green areas on the figure show the 90% confidence intervals.

Specification 2 estimates the effect of short-term interest rates on the ratio of employment rates, and on each employment rate by including the previous quarter's

GDP growth as a control variable.

$$er_{c,t+h} - er_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{2a}$$

$$fer_{c,t+h} - fer_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{2b}$$

$$mer_{c,t+h} - mer_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{2c}$$

The second row of Figure 3.4 shows the estimated impact[5]. The impact of short-term interest rates on female and male employment rates are statistically significant at 1% level. 1% increase in short-term interest rates leads to up to 0.35 decline in female employment rates, and up to 0.445 decline in male employment rates. The negative effect gets larger in each quarter for both employment rates. However, the effect on the ratio is not statistically significant except from the second and third quarter after the change in the short-term interest rate. During second and third quarters, the effect is positive, meaning that the decline in male employment rate is larger than the decline in female employment rate.

Specification 3 has two control variables; lagged REER and GDP growth.

$$er_{c,t+h} - er_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{3a}$$

[5]Detailed results are available in the appendix.

$$fer_{c,t+h} - fer_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \quad \text{(3b)}$$

$$mer_{c,t+h} - mer_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \quad \text{(3c)}$$

The third row of Figure 3.4 presents the estimated impact of short-term interest rates when controls are included for lagged REER and lagged GDP growth[6]. The results are similar to the previous set of specifications. Overall size of the effects on female and male employment rates are larger than the effects in the previous set of specifications.

Specification 4 controls for the inclusion of GDP growth and inflation in the previous quarter.

$$er_{c,t+h} - er_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} gdpgrowth_{c,t-1} + \beta_{3h} inflation_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \quad \text{(4a)}$$

$$er_{c,t+h} - er_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} gdpgrowth_{c,t-1} + \beta_{3h} inflation_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \quad \text{(4b)}$$

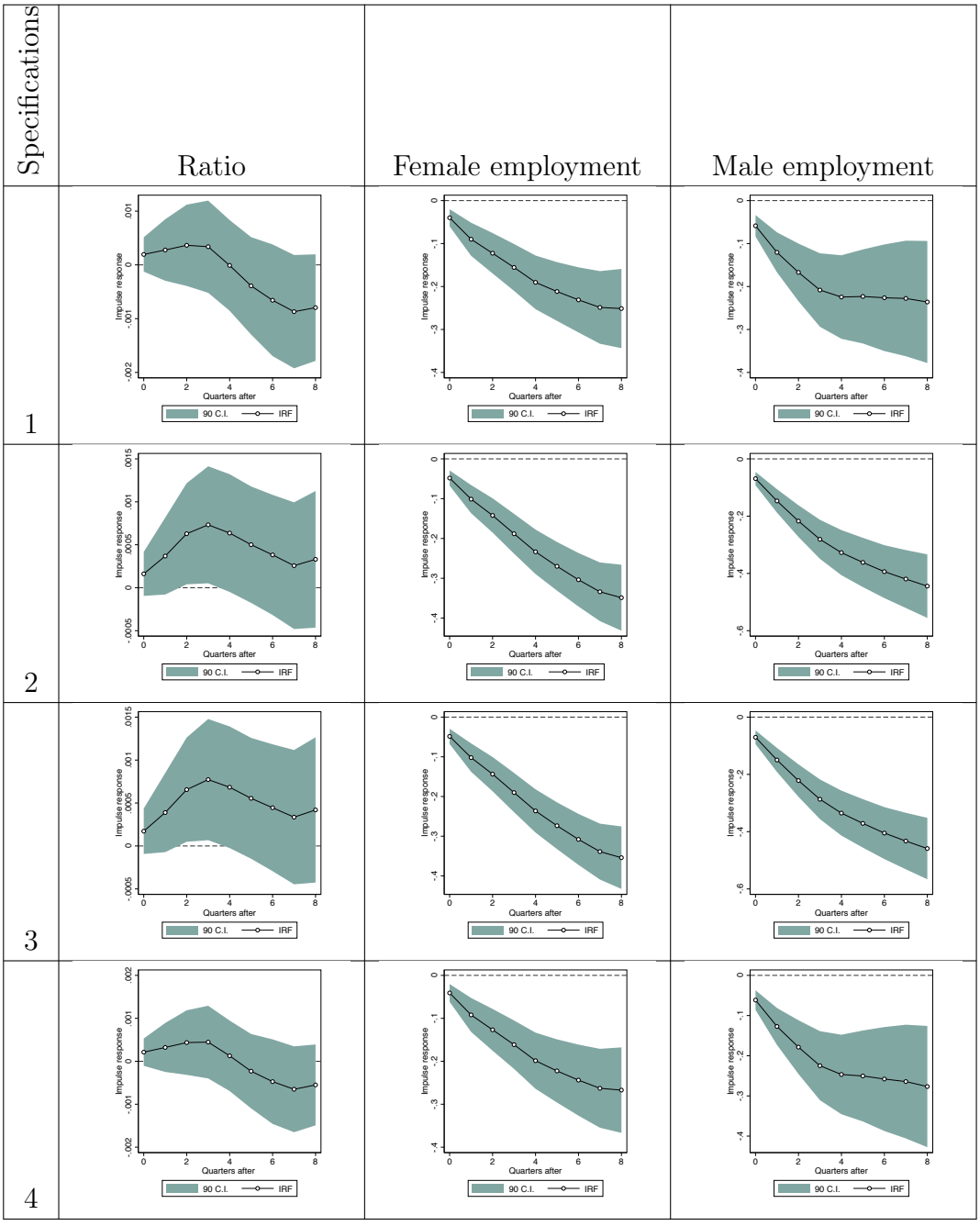
$$er_{c,t+h} - er_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} gdpgrowth_{c,t-1} + \beta_{3h} inflation_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \quad \text{(4c)}$$

[6]Detailed results are available in the appendix.

The impact of short-term interest rates is not statistically significant on the ratio of employment rates (f/m). However, the negative impact on each employment rate is statistically significant at the 1% level. Sizes of the effects are smaller than the previous two sets of specifications.

The estimates across the different specifications yield similar results. A rise in short-term interest rates, which are used to reflect inflation reduction policies, have negative employment outcomes for both men and women but the results do not suggest a strong gender effect. In two of the specifications (2 and 3), in the second quarter, male employment rates are affected more.

Figure 3.4: The impact of short-term interest rates on employment rates



3.4.3.2 The impact of inflation reduction episodes on employment rates

In this section, I examine the impact of inflation reduction episodes on gender-disaggregated employment rates, and the ratio of employment rates (f/m). The first set of specifications (#5) attempts to examine the effect of inflation reduction episodes on the ratio of employment rates (f/m), and on female and male employment rates without any controls.

$$er_{c,t+h} - er_{ct} = \beta_{1h} DE_{c,t} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{5a}$$

$$fer_{c,t+h} - fer_{ct} = \beta_{1h} DE_{c,t} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{5b}$$

$$mer_{c,t+h} - mer_{ct} = \beta_{1h} DE_{c,t} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{5c}$$

where DE represents inflation reduction episodes. The first row of Figure 3.6 shows the estimated impulse responses for this specification[7]. Inflation reduction episodes are presented as dummy variables. Therefore, the estimated negative effect suggests that female employment rates decline in the presence of inflation reduction episodes. The results indicate that female employment rates drop by 0.167-0.183 during second and third quarters of the inflation reduction episode. Apart from this case, the effects of inflation reduction episodes in these specifications, from 5a to 5c, are not statistically significant.

[7]Detailed results are available in Appendix.

The benchmark specifications in this section is as follows:

$$er_{c,t+h} - er_{ct} = \beta_{1h} DE_{c,t} + \beta_{2h} REER_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{6a}$$

$$fer_{c,t+h} - fer_{ct} = \beta_{1h} DE_{c,t} + \beta_{2h} REER_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{6b}$$

$$mer_{c,t+h} - mer_{ct} = \beta_{1h} DE_{c,t} + \beta_{2h} REER_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{6c}$$

In this specification, I control the results for the inclusion of REER in the previous quarter. Tables 3.5,3.6,3.7 and the second row of Figure 3.6 report the results. The estimated coefficients of inflation reduction episodes are not statistically significant for the ratio of employment rates or male employment rates. However, it has significant negative impact on female employment rates until the 5th quarter after the change.

Table 3.5: The impact of inflation reduction episodes on the ratio of employment rates (f/m)

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
DE	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
L.REER	0.006	0.009	0.015**	0.018**	0.020**	0.024**	0.031***	0.036***
	(0.005)	(0.007)	(0.007)	(0.008)	(0.009)	(0.010)	(0.011)	(0.011)
N	1607	1583	1559	1535	1511	1487	1463	1439

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.6: The impact of inflation reduction episodes on female employment rates

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
DE	-0.120*	-0.180*	-0.199*	-0.222*	-0.242*	-0.217	-0.198	-0.182
	(0.072)	(0.094)	(0.111)	(0.128)	(0.146)	(0.163)	(0.178)	(0.192)
L.REER	-0.274	-0.584	-0.766	-1.160*	-1.535**	-1.807**	-2.026**	-2.275**
	(0.410)	(0.504)	(0.578)	(0.663)	(0.774)	(0.885)	(0.964)	(1.026)
N	1607	1583	1559	1535	1511	1487	1463	1439

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

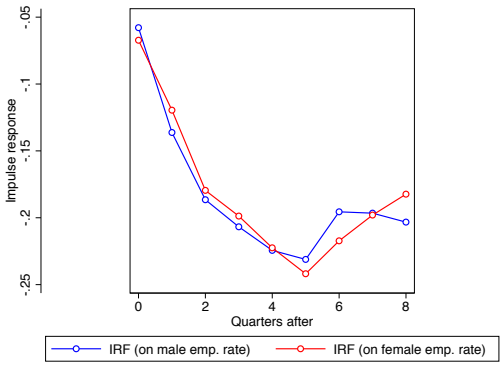
Table 3.7: The impact of inflation reduction episodes on male employment rates

	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
DE	-0.136	-0.187	-0.207	-0.224	-0.231	-0.196	-0.197	-0.203
	(0.091)	(0.126)	(0.156)	(0.176)	(0.195)	(0.215)	(0.232)	(0.252)
L.REER	-0.919*	-1.538**	-2.265***	-3.059***	-3.781***	-4.483***	-5.302***	-6.032***
	(0.482)	(0.634)	(0.774)	(0.896)	(1.027)	(1.157)	(1.265)	(1.343)
N	1607	1583	1559	1535	1511	1487	1463	1439

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 3.5 compares the impulse response functions of two specifications (6b and 6c). Blue and red curves show the impact on male and female employment rates. The impact of inflation reduction episodes on female and male employment rates are similar. The difference is not statistically significant.

Figure 3.5: The impact of inflation reduction episodes on female and male employment rates



I control the results for the inclusion of the lag of REER and GDP growth in the last set of specifications.

$$er_{c,t+h} - er_{ct} = \beta_{1h} DE_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{7a}$$

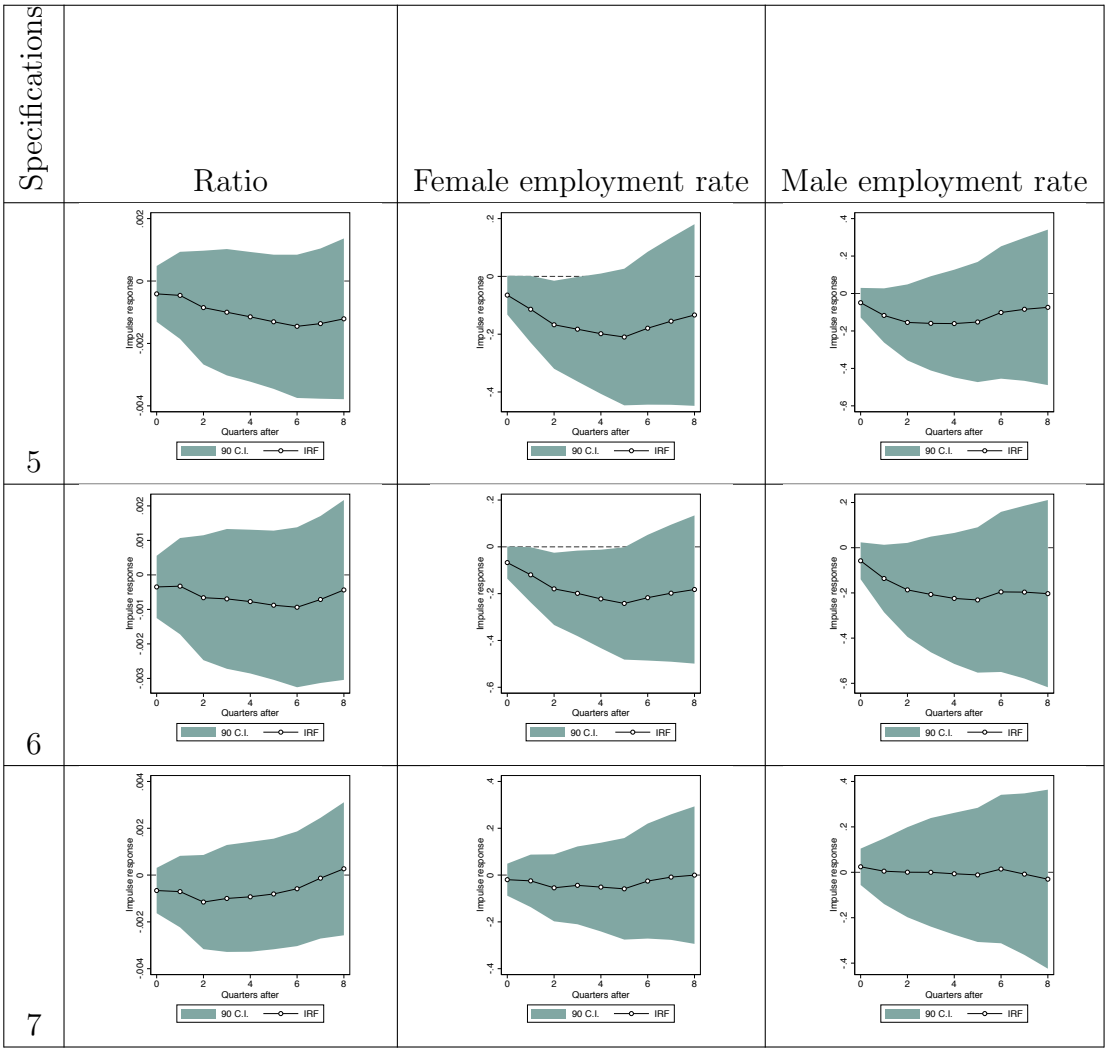
$$fer_{c,t+h} - fer_{ct} = \beta_{1h} DE_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{7b}$$

$$mer_{c,t+h} - mer_{ct} = \beta_{1h} DE_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{7c}$$

The last row of the Figure 3.6 shows the estimated impact of inflation reduction episodes on the ratio of employment rates (f/m), female employment rate, and male

employment rate. The results are not statistically significant similar to the previous specifications in this section. The possible explanation for this is that I do not make any distinction between expansionary and contractionary inflation reduction periods as Braunstein and Heintz (2006) did. The employment effects might be different in these periods.

Figure 3.6: The impact of inflation reduction episodes on employment rates



3.4.3.3 Robustness check

In this section, I control the results for the inclusion of female employment share in different branches of economic activity.

$$er_{c,t+h} - er_{ct} = \beta_{1h} i_{c,t} + \beta_{2h} REER_{c,t-1} + \beta_{3h} gdpgrowth_{c,t-1} + \tag{8}$$

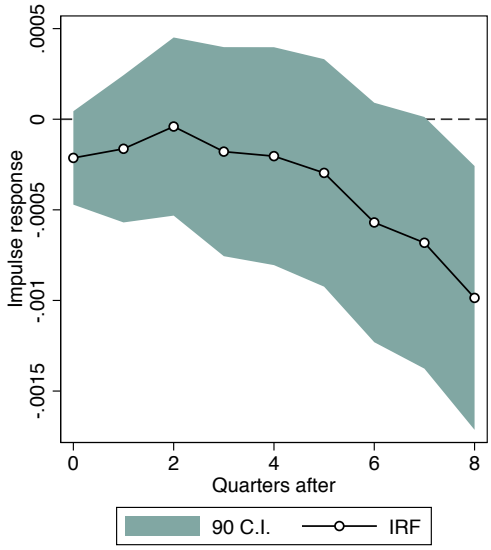
$$\beta_{4h} inflation_{c,t-1} + \beta_{5h} fshare_{j,c,t} + \mu_c + \tau_t + \varepsilon_{c,t} \tag{3.1}$$

where $fshare$ is the female employment share in different economic activity branches. j represents these branches, and they are agriculture, construction, manufacturing, mining, trade, and public sectors.

Figure 3.7 shows the impact of short-term interest rates on the ratio of employment rates[8]. The results suggest that 8 quarters after the change, inflation reduction policies affect female employment rates more than male employment rates. A 1% increase in the short-term interest rate leads to an 0.001 decline in the ratio of employment rates (f/m). If we isolate the effect of changes of female employment share in broadly defined branches of economic activity, inflation reduction policies might affect female employment rate more.

[8]Detailed results are available in the appendix.

Figure 3.7: The impact of short-term interest rate on the ratio of employment rates (f/m), additional controls for the female employment share in different economic activities



As I discuss in the model in the first chapter, there are different channels for the effects of macroeconomic policies, and different channels lead to different gender impacts. These different channels might offset each other's effect. Results in this section would support such a case. Before controlling for the female employment shares, which might show a broadly categorized labor market segregation, there was no clear evidence of a disproportionate impact on women relative to men; however, with the inclusion of these control variables, the results suggest that there might be a gender impact. When I keep shares of employment constant, an increase in short-term interest rates affect female employment rates more starting from the 8th quarter after the change.

3.5 Conclusion

Inflation reduction policies that are represented by a change in short-term interest rates in this paper have statistically significant impact on female and male employment rates. An increase in short-term interest rates leads to a decline in both employment rates. However, this paper does not provide any evidence on differential gender impact. The difference between the effects on female and male employment rates is very small, and not significant. The results estimated here suggest that inflation reduction policies have a disproportionate impact on female employment rates at the end of the eight-quarter period when it is controlled for female employment shares in broadly defined economic activity branches. On the other hand, according to the second empirical strategy, it is not clear if the inflation reduction episodes have an effect on employment rates or any gender difference in the effects apart from two specifications. According to findings of these specifications, inflation reduction episodes have a negative impact on female employment rates in the beginning of the eight-quarter period.

There are several channels through which inflation reduction policies could affect gender-disaggregated employment rates although they are not all empirically tested in this paper. Overall effects of these channels appear to be not significant; however, when we isolate the effect of broadly defined labor market segregation, we estimate a negative disproportionate impact on female employment rates eight quarters after the policy change. This might possibly suggest that other channels have biased toward female employment.

There are several ways to extend the research question discussed here for further research. The current empirical strategy has some limitations. To avoid these limitations, the effects of monetary policies can be identified with other identification strategies. Using a narrative data similar to the second essay might be an approach to address these limitations. Another possible research is to look at the heterogeneity among countries because different countries may experience different gender impacts of inflation reduction policies based on some factors such as sectoral structures of the countries, different work-family policies, business cycle or depending on whether the country is a developing country. A further research can empirically estimate various channels of monetary policies on labor market. These channels might lead to different gender implications.

CONCLUSION

The theoretical model and empirical analyses in this dissertation suggest that fiscal and monetary policies can have distinct effects on female and male employment rates. However, the effects may vary depending on the type of the policy and on the structure of the market and non-market economies. Specifically, while fiscal consolidation has a large disproportionate impact on female employment rates, the evidence regarding the effects of monetary policy is less clear.

The channels through which fiscal and monetary policies affect employment rates are not necessarily the same. Specifically, fiscal policies have a direct effect on the public sector, while monetary policies have a more immediate effect on the private sector. Because women's employment share in the public sector is larger, we are likely to find different gender effects. The empirical essays present different findings for fiscal and monetary policies. Austerity policies have direct effects on women's paid work while monetary policies are more likely to have less direct effects.

Gender inequalities in the economy could determine how macroeconomic policies affect gender-specific employment rates. The first essay draws attention to gender inequalities in the following areas: labor market segregation, the gender division of labor in the household, and labor supply dynamics. Through these channels, fiscal and monetary policies have different impacts on female and male employment rates. More specifically, the labor intensity of female-dominated sectors, different capacity

utilization responses of female and male sectors to aggregate demand shocks, and women's unpaid work burden produce unequal effects of macroeconomic policies on employment rates. The model's findings suggest that overall effects of these channels might be ambiguous, depending on the responsiveness of different sectors to aggregate demand shocks, other in many cases we expect the female employment is disproportionately affected from contractionary policies.

The first essay makes assumptions to emphasize the role of these channels. Relaxing these assumptions could change the size of these effects. However, as long as these channels exist, macroeconomic policies are likely to affect female and male paid work differently.

In reality, these areas of gender inequalities are more complicated than discussed here. First, employment in most sectors is not completely segregated by gender. Even though sectors can be female- or male- dominated, most sectors are to some extent mixed-gender sectors. Second, in some households, men also take responsibility of unpaid care work even if the empirical literature shows that, on average, women do significantly more unpaid care work than men. Third, the effect of bargaining power on female labor supply is more complicated. The bargaining power of men in the household might have contradictory effects from the desire for both unpaid work of women and income from women's paid employment. Depending on other factors as well, the impact of bargaining power on unpaid work might be ambiguous. Further research could explore these areas by relaxing the current assumptions.

In the second and third essays, I apply cross-country analysis, and partially control for differences among countries using a range of control variables and fixed effects.

The advantage of this approach is that with a wider range of data, I show that fiscal consolidation has a disproportionate impact on women's employment.

In the second essay, I address a possible endogeneity problem by using a data derived with a narrative approach. The dataset identifies fiscal consolidations that are only motivated by a desire to reduce budget deficit, so they are less likely to be correlated with prospective economic conditions. Narrative data let me focus on fiscal consolidation rather than other fiscal shocks. By using a cross-country analysis, I show that regardless of the differences among countries, austerity policies have a disproportionately negative impact on female employment 3-6 years after the policy change.

The main channel that is widely discussed in the literature to explain the disproportionate impact of fiscal policies on female employment rate is labor market segregation. The model incorporates such a channel but the empirical analysis does not provide evidence that broad labor market segregation is the primary channel through which macroeconomic policy has distinct gender outcomes. In the second essay, the results are robust to the inclusion of female employment shares in broadly defined economic activity branches. However, labor market segregation might still play a role if we look at the segregation in greater detail.

This essay shows that overall fiscal consolidation has a disproportionate impact on female employment rate; and the impact is driven by spending-based fiscal consolidation rather than tax-based fiscal consolidation. Further research could point out how budget cuts in different areas have different effects. Especially, cuts in spending on care-related services may matter in explaining the effect on female employment

rates. A dataset on childcare data would help to answer these questions. Free or subsidized care can reduce the burden of unpaid care work for women, and this might affect the results.

Using a proxy for the policy interest rate, i.e. short-term interest rates, the third essay finds evidence suggesting that contractionary monetary policies decrease both male and female employment rates; although the gender difference is not significant. However, the short-term interest rate is not a perfect proxy for the policy interest rate. Another estimation strategy could address the research question more accurately by using a new dataset to identify the monetary policy; such as the daily policy rate.

In the third essay, I was unable to find gender differences in the effect of monetary policy on employment rates. However, this essay implies that different channels of monetary policy might have different gender effects, and they can offset each other, which is also discussed with respect to the model in the first essay.

Even though it is not discussed in the essay, changes in paid work time might also reflect changes from full-time to part time, or vice versa (i.e. hours of work). The model considers the paid and unpaid work in terms of the time that is spent on them. This can be analyzed empirically as well. As well as people moving from full-time to part-time, we can also observe the difference between losing a full-time or a part-time job.

Another aspect that needs additional exploration is the degree of variation among countries in the second and third essays. In the second essay, I control the results for some of these differences. In the third essay, I only look at the female employment

share in broadly defined economic activity branches. However, with more data it is possible to point out further variation/heterogeneity such as on work family policies, structure of expenditure on childcare and elder care. This further extension would also clarify the role of work-family policies, and how these policies change the effect of macroeconomic policies.

Another extension would be to look at the variation of the results based on education. Women with low and high education might not experience similar consequences of policy changes. Thus, it would be important to see if the results still hold after controlling for low/high education level of women. The education level might change the degree of the labor market segregation, and this might affect the results.

There is need for further research on both the theoretical and empirical aspects of fiscal and monetary policies in order to better understand the underlying transmission channels. This research can be extended to analyze the effects of different macroeconomic policies by using gender-aware macroeconomic models. Such research can help explain gender implications of macroeconomic questions on different labor market outcomes and non-market work. The theoretical findings in the first essay shed light on the impact on both paid and unpaid work of women, and how these two types of work could affect each other. Even though empirical essays estimated some of these effects there is need for more research that can empirically test the implications of the model.

APPENDIX A

CHAPTER 1: DEFINITIONS OF VARIABLES

Table A.1: Definitions of Variables

Indicators	
Variables	Definitions
Y	output
Y_i	market output in male and female sectors where $i = m, f$
Y_h	total non-market output
Y_T	total market output
L_i	male and female employment where $i = m, f$
b	labor-output ratio in male sector
c	labor-output ratio in female sector
H	maximum hours that can be divided to work for women
U	minimum amount of work that household needs
UWT	unpaid work time
N_f	number of female workers
P	price level
τ, θ	mark-up rates for male and female sectors
w_i	nominal wage rate for male and female workers where $i = m, f$
ω_i	nominal wage rate for male and female workers where $i = m, f$
σ_i	male and female sectors' share of total market output where $i = m, f$
π_i	profit shares in male and female sectors where $i = m, f$
K_i	capital stock in male and female sectors where $i = m, f$
ρ	profit rate
R	total profit
z	capacity utilization
z_i	capacity utilization in male and female sectors where $i = m, f$
$\overline{Y}$	full capacity output
I	investment
i	investment divided by capital stock
S	saving
s	saving divided by capital stock
s_i	workers' and capital's saving where $i = w, \pi$
C	consumption
T	tax
G	government expenditures
D	government's balanced budget
u	output-capital ratio
n	nominal interest rate
r	real interest rate

APPENDIX B

CHAPTER 2: ADDITIONAL RESULTS

Table B.1: The cumulative impact of the size of fiscal consolidation on female employment rate, with two-way fixed effects

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
size	-45.701***	-60.515***	-64.599***	-65.143***	-61.793**	-41.658	-30.162	-15.655
	(14.713)	(20.102)	(22.489)	(22.496)	(24.127)	(26.897)	(27.908)	(29.885)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.2: The cumulative impact of the size of fiscal consolidation on male employment rate, with two-way fixed effects

	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
size	-48.808**	-60.311**	-57.301**	-44.629*	-36.352	-20.037	-9.288	2.238
	(24.234)	(27.836)	(28.122)	(26.302)	(27.188)	(29.113)	(29.898)	(30.522)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.3: The cumulative impact of the size of tax-based fiscal consolidation, with two-way fixed effects

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
sizetb	-0.078	-0.304	-0.254	-0.329	-0.367	-0.205	-0.059	-0.132
	(0.155)	(0.233)	(0.230)	(0.240)	(0.280)	(0.320)	(0.300)	(0.298)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.4: The cumulative impact of the size of spending-based fiscal consolidation, with two-way fixed effects

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
sizesb	-0.085	-0.144	-0.288*	-0.473***	-0.528***	-0.425**	-0.375**	-0.226
	(0.161)	(0.154)	(0.147)	(0.121)	(0.137)	(0.170)	(0.182)	(0.214)
N	428	427	428	428	428	428	428	428

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.5: The cumulative impact of the size of fiscal consolidation, with two-way fixed effects and FLFPR

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.122	-0.231	-0.342**	-0.531***	-0.564***	-0.433**	-0.330**	-0.229
	(0.136)	(0.145)	(0.153)	(0.145)	(0.157)	(0.173)	(0.168)	(0.170)
FLFPR	0.001*	0.001	0.000	0.000	-0.001	-0.001	-0.002**	-0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	426	426	426	426	426	426	426	426

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.6: The cumulative impact of the size of fiscal consolidation, with two-way fixed effects and economic activity

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.125	-0.205	-0.343**	-0.570***	-0.634***	-0.487***	-0.346**	-0.202
	(0.149)	(0.159)	(0.157)	(0.140)	(0.138)	(0.153)	(0.145)	(0.154)
Agriculture	-0.002	-0.002	-0.004	-0.005	-0.004	-0.001	0.002	0.005
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Services	0.001	0.001	0.000	-0.000	-0.002	-0.003***	-0.005***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	301	300	301	301	301	301	301	301

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.7: The cumulative impact of the size of fiscal consolidation and female employment share in public

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.444***	-0.599***	-0.742***	-0.986***	-1.039***	-0.927***	-0.825***	-0.773***
	(0.093)	(0.119)	(0.129)	(0.159)	(0.162)	(0.177)	(0.184)	(0.162)
fsharePUB	-0.000	-0.001	-0.001**	-0.002**	-0.002**	-0.002***	-0.003**	-0.003**
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	294	276	259	242	224	207	189	171

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.8: The cumulative impact of the size of fiscal consolidation and female employment share in agriculture

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.390***	-0.485***	-0.527***	-0.691***	-0.642***	-0.444**	-0.311	-0.146
	(0.088)	(0.116)	(0.142)	(0.166)	(0.181)	(0.203)	(0.204)	(0.210)
fshareAGR	-0.000	-0.001	-0.001*	-0.002*	-0.002**	-0.002**	-0.003**	-0.003**
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	379	361	344	327	309	292	274	256

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.9: The cumulative impact of the size of fiscal consolidation and female employment share in agriculture, public administration and construction

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.381***	-0.540***	-0.635***	-0.895***	-0.925***	-0.810***	-0.675***	-0.629***
	(0.091)	(0.118)	(0.134)	(0.165)	(0.161)	(0.165)	(0.178)	(0.147)
fsharePUB	-0.000	-0.001*	-0.001**	-0.002**	-0.002**	-0.002**	-0.002**	-0.002*
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
fshareCON	0.003***	0.001	0.001	-0.001	-0.003*	-0.004***	-0.004**	-0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
fshareAGR	-0.000	-0.001	-0.001**	-0.001**	-0.002***	-0.002***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	294	276	259	242	224	207	189	171

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B.10: The cumulative impact of the size of fiscal consolidation and female employment share in different economic activities

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
size	-0.363***	-0.486***	-0.635***	-0.876***	-0.966***	-0.858***	-0.712***	-0.580***
	(0.091)	(0.104)	(0.129)	(0.163)	(0.162)	(0.167)	(0.185)	(0.143)
fsharePUB	-0.000	-0.001	-0.001*	-0.002**	-0.001	-0.002**	-0.002**	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
fshareCON	0.003***	-0.000	-0.001	-0.003*	-0.003**	-0.004**	-0.004**	-0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
fshareAGR	-0.001	-0.001**	-0.002***	-0.002***	-0.002***	-0.002***	-0.003***	-0.003***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
fshareMAN	0.001	0.002**	0.002**	0.002	0.002	0.001	0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
fshareMEL	-0.000	0.000	0.000	0.001	0.000	0.000	-0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
fshareMKT	-0.000	0.000	0.000	0.000	-0.001	-0.000	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
N	289	271	254	237	219	202	184	166

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

APPENDIX C

CHAPTER 2: UNIT ROOT TESTS

I apply fisher type unit root test with augmented Dickey Fuller specifications to each panel. I prefer fisher type unit root test because it can be used with an unbalanced panel data. I present the test results for both sections on tables below. The tables shows the p values of unit root tests.

Table C.1: P values for the unit root test

Variables	(1)	(2)	(3)	(4)
ratio-er	p<0.001	0.99	0.003	0.98
female-er	0.39	0.73	0.65	0.103
male-er	p<0.001	0.143	p<0.001	p<0.001
female-lfpr	p<0.001	0.008	p<0.001	p<0.001
agriculture	p<0.001	0.42	p<0.001	0.48
service	0.13	0.76	p<0.001	p<0.001
industry	0.486	0.95	p<0.001	p<0.001
fshare-agr	p<0.001	p<0.001	0.06	0.2
fshare-con	p<0.001	p<0.001	p<0.001	0.006
fshare-man	0.05	0.01	0.98	0.82
fshare-mel	p<0.001	p<0.001	0.002	p<0.001
fshare-mkt	0.215	0.002	0.33	0.15
fshare-pub	0.996	0.37	1	0.01

Notes:(1):AR(1) process without a trend, no lags (2):AR(1) process with a trend, no lags (3): AR(1) process without a trend, with an additional lagged difference term, (4):AR(1) process with a trend, with an additional lagged difference term

APPENDIX D

CHAPTER 3: SUMMARY STATISTICS

Table D.1: Summary statistics

	Observation	Mean	Std. Dev.	Min	Max
interest rate	1606	2.82	3.038	-.777	19.683
female employment rate	1623	59.242	10.936	21.947	84.312
male employment rate	1623	71.782	6.172	56.241	90.045
REER	1623	.9965	.1042	.634	1.623
Inflation	1623	2.577	2.501	-6.128	17.084
gdpgrowth	1949	2.47	3.495	-17.533	29.09

APPENDIX E

CHAPTER 3: ADDITIONAL RESULTS FOR THE IMPACT OF SHORT-TERM INTEREST RATE

Table E.1: The impact of short-term interest rates on the ratio of employment rates (f/m), controlling for the GDP growth

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
interestrate	0.000	0.001*	0.001*	0.001	0.001	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.gdpgrowth	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.2: The impact of short-term interest rates on female employment rates, controlling for the GDP growth

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
interestrate	-0.101***	-0.142***	-0.188***	-0.234***	-0.270***	-0.304***	-0.334***	-0.349***
	(0.021)	(0.026)	(0.030)	(0.034)	(0.037)	(0.041)	(0.045)	(0.050)
L.gdpgrowth	0.064***	0.080***	0.097***	0.108***	0.115***	0.118***	0.110***	0.106***
	(0.013)	(0.017)	(0.021)	(0.025)	(0.028)	(0.031)	(0.035)	(0.038)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.3: The impact of short-term interest rates on male employment rates, controlling for the GDP growth

	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
interestrate	-0.147***	-0.217***	-0.281***	-0.328***	-0.362***	-0.394***	-0.420***	-0.445***
	(0.025)	(0.034)	(0.041)	(0.048)	(0.052)	(0.056)	(0.061)	(0.067)
L.gdpgrowth	0.094***	0.121***	0.134***	0.139***	0.138***	0.130**	0.114**	0.099
	(0.022)	(0.030)	(0.038)	(0.044)	(0.049)	(0.053)	(0.057)	(0.061)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.4: The impact of short-term interest rates on the ratio of employment rates (f/m), controlling for the GDP growth and REER

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
interestrate	0.000	0.001*	0.001*	0.001	0.001	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
L.gdpgrowth	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.REER	0.007	0.011	0.016**	0.020**	0.022***	0.026***	0.033***	0.038***
	(0.005)	(0.007)	(0.007)	(0.008)	(0.008)	(0.010)	(0.011)	(0.011)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.5: The impact of short-term interest rates on female employment rates, controlling for the GDP growth and REER

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
interestrate	-0.102***	-0.144***	-0.190***	-0.236***	-0.274***	-0.308***	-0.339***	-0.354***
	(0.022)	(0.026)	(0.030)	(0.033)	(0.036)	(0.039)	(0.043)	(0.048)
L.gdpgrowth	0.064***	0.080***	0.097***	0.108***	0.114***	0.117***	0.108***	0.105***
	(0.013)	(0.017)	(0.021)	(0.024)	(0.028)	(0.031)	(0.034)	(0.038)
L.REER	-0.298	-0.607	-0.790	-1.182**	-1.545**	-1.824**	-2.049**	-2.307***
	(0.380)	(0.468)	(0.519)	(0.573)	(0.658)	(0.748)	(0.807)	(0.864)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.6: The impact of short-term interest rates on male employment rates, controlling for the GDP growth and REER

	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
interestrate	-0.150***	-0.222***	-0.287***	-0.335***	-0.371***	-0.405***	-0.433***	-0.459***
	(0.026)	(0.034)	(0.042)	(0.048)	(0.051)	(0.055)	(0.060)	(0.065)
L.gdpgrowth	0.093***	0.121***	0.134***	0.138***	0.136***	0.127**	0.111**	0.096
	(0.022)	(0.029)	(0.037)	(0.044)	(0.049)	(0.052)	(0.056)	(0.061)
L.REER	-1.013**	-1.671***	-2.418***	-3.215***	-3.932***	-4.652***	-5.485***	-6.227***
	(0.412)	(0.546)	(0.662)	(0.759)	(0.864)	(0.967)	(1.052)	(1.109)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.7: The impact of short-term interest rates on the ratio of employment rates (f/m), controlling for the GDP growth and inflation

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
interestrate	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.001	-0.001
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
L.gdpgrowth	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.CPI	0.000	0.000	0.000	0.001	0.001*	0.001*	0.002*	0.002**
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.8: The impact of short-term interest rates on female employment rates, controlling for the GDP growth and inflation

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
interestrate	-0.092***	-0.127***	-0.161***	-0.199***	-0.223***	-0.244***	-0.263***	-0.267***
	(0.024)	(0.030)	(0.034)	(0.040)	(0.045)	(0.050)	(0.056)	(0.060)
L.gdpgrowth	0.063***	0.078***	0.095***	0.106***	0.112***	0.113***	0.104***	0.099***
	(0.013)	(0.017)	(0.021)	(0.024)	(0.028)	(0.031)	(0.033)	(0.037)
L.CPI	-0.015	-0.026	-0.045	-0.058	-0.080*	-0.101*	-0.121**	-0.140**
	(0.021)	(0.028)	(0.032)	(0.037)	(0.044)	(0.052)	(0.060)	(0.063)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.9: The impact of short-term interest rates on male employment rates, controlling for the GDP growth and inflation

	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
interestrate	-0.127***	-0.179***	-0.225***	-0.247***	-0.250***	-0.258***	-0.264***	-0.277***
	(0.028)	(0.041)	(0.052)	(0.060)	(0.069)	(0.079)	(0.086)	(0.092)
L.gdpgrowth	0.092***	0.118***	0.130***	0.133***	0.129***	0.119**	0.102*	0.085
	(0.022)	(0.030)	(0.037)	(0.043)	(0.047)	(0.050)	(0.054)	(0.058)
L.CPI	-0.033	-0.065*	-0.094*	-0.135**	-0.188**	-0.230***	-0.265***	-0.288***
	(0.026)	(0.039)	(0.051)	(0.062)	(0.074)	(0.088)	(0.096)	(0.100)
N	1591	1567	1543	1519	1495	1471	1447	1423

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table E.10: The impact of inflation reduction episodes on the ratio of employment rates (f/m), controls for female employment share in different economic activity branches

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
interestrate	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
fshareConstruction	-0.028	-0.075**	-0.053	-0.051	-0.070*	-0.088**	-0.125***	-0.131***
	(0.029)	(0.031)	(0.034)	(0.037)	(0.041)	(0.041)	(0.046)	(0.050)
fshareAgriculture	0.015	0.004	0.012	0.028	0.026	0.009	0.012	0.028
	(0.015)	(0.016)	(0.017)	(0.019)	(0.021)	(0.023)	(0.026)	(0.027)
fshareManufacturing	0.018	-0.017	-0.032	-0.075*	-0.061	-0.048	-0.056	-0.081
	(0.026)	(0.030)	(0.037)	(0.041)	(0.045)	(0.050)	(0.051)	(0.052)
fsharePublic	-0.012	-0.046	-0.050	-0.078**	-0.096**	-0.127***	-0.201***	-0.212***
	(0.028)	(0.029)	(0.035)	(0.039)	(0.042)	(0.044)	(0.049)	(0.054)
fshareMining	-0.009	0.016	0.016	0.016	0.004	0.008	0.037**	0.049**
	(0.012)	(0.010)	(0.013)	(0.013)	(0.014)	(0.015)	(0.017)	(0.019)
fshareTrade	0.028	0.038	0.048	0.072	0.090*	0.094*	0.117**	0.121*
	(0.032)	(0.035)	(0.040)	(0.045)	(0.048)	(0.052)	(0.058)	(0.066)
L.gdpgrowth	0.000	0.000	0.000	0.000	0.001**	0.001**	0.001**	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.REER	0.003	0.005	0.009	0.014*	0.019**	0.021**	0.022**	0.028***
	(0.005)	(0.006)	(0.008)	(0.008)	(0.009)	(0.009)	(0.010)	(0.010)
L.CPI	0.000	0.001**	0.001**	0.001**	0.001***	0.001***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
N	1061	1043	1026	1010	993	977	962	945

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

APPENDIX F

CHAPTER 3: ADDITIONAL RESULTS FOR THE IMPACT OF INFLATION REDUCTION EPISODES

Table F.1: The impact of inflation reduction episodes on the ratio of employment rates (f/m), raw effects

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
DE	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
N	1607	1583	1559	1535	1511	1487	1463	1439

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table F.2: The impact of inflation reduction episodes on female employment rates, raw effects

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
DE	-0.114	-0.167*	-0.183*	-0.198	-0.210	-0.179	-0.155	-0.134
	(0.070)	(0.093)	(0.110)	(0.127)	(0.144)	(0.161)	(0.176)	(0.191)
N	1607	1583	1559	1535	1511	1487	1463	1439

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table F.3: The impact of inflation reduction episodes on male employment rates, raw effects

	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
DE	-0.117	-0.154	-0.160	-0.161	-0.152	-0.101	-0.084	-0.074
	(0.088)	(0.123)	(0.153)	(0.175)	(0.195)	(0.215)	(0.232)	(0.252)
N	1607	1583	1559	1535	1511	1487	1463	1439

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table F.4: The impact of inflation reduction episodes on the ratio of employment rates (f/m), controlling for REER and GDP growth

	(1) ratio1	(2) ratio2	(3) ratio3	(4) ratio4	(5) ratio5	(6) ratio6	(7) ratio7	(8) ratio8
DE	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
L.REER	0.006	0.009	0.015**	0.018**	0.021**	0.026***	0.032***	0.038***
	(0.005)	(0.006)	(0.007)	(0.008)	(0.008)	(0.010)	(0.010)	(0.011)
L.gdpgrowth	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	1607	1584	1571	1536	1512	1489	1475	1441

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table F.5: The impact of inflation reduction episodes on female employment rates, controlling for REER and GDP growth

	(1) fer1	(2) fer2	(3) fer3	(4) fer4	(5) fer5	(6) fer6	(7) fer7	(8) fer8
DE	-0.025	-0.054	-0.044	-0.051	-0.059	-0.026	-0.009	-0.000
	(0.068)	(0.087)	(0.101)	(0.115)	(0.132)	(0.149)	(0.163)	(0.179)
L.REER	-0.232	-0.494	-0.672	-1.019	-1.366*	-1.602*	-1.833*	-2.095**
	(0.403)	(0.499)	(0.556)	(0.650)	(0.766)	(0.878)	(0.948)	(1.026)
L.gdpgr	0.071***	0.088***	0.110***	0.124***	0.133***	0.139***	0.134***	0.133***
	(0.013)	(0.018)	(0.022)	(0.026)	(0.029)	(0.032)	(0.035)	(0.038)
N	1607	1584	1571	1536	1512	1489	1475	1441

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table F.6: The impact of inflation reduction episodes on male employment rates, controlling for REER and GDP growth

	(1) mer1	(2) mer2	(3) mer3	(4) mer4	(5) mer5	(6) mer6	(7) mer7	(8) mer8
DE	0.005	0.000	-0.000	-0.007	-0.011	0.014	-0.008	-0.030
	(0.088)	(0.121)	(0.145)	(0.163)	(0.180)	(0.199)	(0.216)	(0.240)
L.REER	-0.856*	-1.450**	-2.145***	-2.922***	-3.612***	-4.354***	-5.146***	-5.970***
	(0.452)	(0.594)	(0.701)	(0.842)	(0.987)	(1.120)	(1.213)	(1.309)
L.gdpgr	0.105***	0.137***	0.156***	0.162***	0.163***	0.158***	0.145***	0.133**
	(0.024)	(0.033)	(0.040)	(0.047)	(0.050)	(0.053)	(0.056)	(0.060)
N	1607	1584	1571	1536	1512	1489	1475	1441

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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