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Monetary policy and gender discrimination in the credit market

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ABSTRACT

The studies on monetary policy highlight that a contractionary policy reduces a firm's access to external funds. However, it is unknown whether it affects men and women equally. In this scenario, the aim of this paper is twofold. First, to investigate the differential effect of monetary policy on female- and male-run firms. We find that a contractionary monetary policy widens credit market discrimination, i.e., female-owned and -managed firms receive less funds during a tight monetary policy period. This effect reverses during the expansionary period, i.e., female-run firms are more likely to receive funds than male-run firms. This result implies that during a tight policy period, financial institutions resort to credit rationing and women are the victims of this practice, whereas during an expansionary period, banks are flushed with money and they channelize these excess funds to female-owned firms. Our results also indicate that the adverse effects of the policy fall heavily on small and medium enterprises. Second, to study the impact of gender equality on monetary policy-led credit market discrimination. We find that credit market discrimination during the contractionary period is relatively lower (higher) in a country where gender equality (gap) is higher. This is another evidence that women receive less external funds not based on their lack of repayment ability but rather on society's predetermined notions about their incapability.

1. Introduction

The objective of a central bank is to attain economic growth and to maintain price stability. For this, they engage in several activities such as adjusting interest rates and controlling the quantity of money. The impact of such policies on credit market is widely discussed in the broad literature on 'credit market channel of monetary policy transmission' (Gertler and Karadi, 2015; Bräuning and Ivashina, 2020; Albertazzi et al., 2021). The crux of this idea is that a monetary contraction (expansion) will reduce (increase) credit availability and economic agents will face more (less) financial crunch.

Another set of studies in credit market literature focuses on gender discrimination to attain external funds (Becker 1957; Arrow, 1973; Phelps, 1972). The female-owned or managed firms find it more difficult to obtain formal loans (Muravyev et al., 2009; Bellucci et al., 2010; Mascia and Rossi, 2017). This phenomenon is due to the lenders' preferences and beliefs about women (*taste-based or prejudicial discrimination*), or they use soft information about borrowers while approving loans to cope with asymmetric information problems (*statistical discrimination*).

We merge both the literature and investigate the following questions. First, given that women face more hindrances to access external finance,

does a monetary contraction further push female-run enterprises to be more constrained? In other words, we explore whether the monetary policy affects female- and male-run firms differently. Since monetary contraction reduces loanable funds in the economy (Kashyap et al., 1996), financial institutions are more likely to cut short funds for women. Second, if the discrimination is purely prejudice-based and not on the real abilities of women, then the differential impact of monetary policy on female- and male-run firms is supposed to be less when the gender gap is lower. To investigate that, we study the heterogeneous effect of monetary policy-led discrimination in low- and -high gender gap countries.

These questions are important to study since they help in understanding why women lag behind men in various economic activities. Previous studies have highlighted that female-run firms are relatively less productive and innovative (Thébaud, 2015; Link and van Hasselt, 2019). Given that these factors are a function of access to finance (Ayyagari et al., 2011; Hall and Lerner, 2010; Beck et al., 2005), it is imperative to know whether monetary policy worsens the performance of female-run firms by stretching gender discrimination in the credit market. Further, our study helps to understand the role of gender equality in macroeconomic policy transmissions. Existing studies identifies that gender equality promotes economic growth and development

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through human capital development, labour force participation, time allocation and bargaining power (Klasen and Lamanna, 2009; Agénor and Canuto, 2012; Bandara, 2015). This study may further provide an additional reason why there should be equal treatment for both men and women, and to highlight the importance of inclusion of gender equality as one of the Sustainable Development Goals.

This study uses firm-level panel data belonging to 18 countries and an ordered probit estimation in the empirical analysis. We classify firms into 3 categories - firm's whose financial constraints get worsened, remain the same, and improved. The first set of analyses presents robust evidence for widening of credit market gender discrimination during the time of monetary policy contraction. As the policy measure increases, the probability of female-owned firms falling in the constrained category increases compared to male-owned firms. Further, we observe that these firms face relatively lower difficulties in obtaining loans (compared to male-owned firms) in the monetary easing period. That is, the probability of female-owned firms falling under the constrained category is lower than the male-owned firms in these periods. We interpret these opposite results as: during a tight policy period, financial institutions resort to credit rationing and women are the victims of this practice. More specifically, financial institutions reduce funding for female-owned firms to cope with the shortage of funds. This phenomenon is evidence of taste-based discrimination or lack of bargaining power (Alesina et al., 2013). When there is a monetary easing and banks are flushed with money, they channelize these excess funds to female-owned firms. Additionally, we replicate these analyses on female-managed firms and find a consistent result. That is, the financial constraints of female-managed firms increase more than male-owned firms at the time of monetary policy tightening. Our other set of analyses explores the above relationship among small, medium and large firms separately. We find that the burden of monetary policy falls more on female-owned small and medium firms. This result may probably be due to the fact that large firms have better track records and are less likely to face financial constraints.

To understand whether gender equality reduces such discrimination due to tight monetary policy, we merge our data with information on the gender gap in each country. This study uses the Global Gender Gap Index (GGGI) as a proxy for gender equality. This measure accounts for gender disparities in economic, educational, health and political domains. Our empirical analysis reveals that credit market discrimination during the contractionary period is relatively lower (higher) in a country where gender equality (gap) is higher. That is, both female-owned and -managed firms in low gender disparity countries face relatively lower constraints than those within a higher gender gap. This is another evidence which reveals that women receive less external funds not based on their lack of repayment ability but rather on society's pre-determined notion about their incapability.

It is also possible that improved access to finance for women (economic equality) can cause a lower GGGI. To ensure that our results are not from a spurious regression, we further extend our analysis to identify which types of gender equality trigger our result. For that, we segregate the impact arising from economic, educational, health and political gender equality using the subindices of GGGI such as Economic Participation and Opportunity Index, Educational Attainment Index, Health and Survival Index, and Political Empowerment Index respectively. We find that educational and political equalities are the main reasons for women's better access to finance and the effect of other domains are insignificant.

This study contributes to the existing literature in the following ways. The monetary policy literature largely focuses on its transmission mechanism, its impact on the asset market, and access to credit (Demiralp et al., 2021; Chava and Hsu, 2020; Geromichalos and Herrenbrueck, 2016; Bernanke and Gertler, 1995). However, its differential effect on men and women still remains an underexplored topic (Takh-tamanova and Sierminska, 2009). Previous studies on the heterogeneous effect of monetary policy account for investor sentiment,

macroeconomic cycles, policy uncertainty and others (Kurov and Stan, 2018; Kurov, 2010; Basistha and Kurov, 2008). This study provides evidence for a differential effect of monetary policy on credit access among female- and male-run firms.

We also contribute to the literature on credit market discrimination. Existing studies in this field are largely confined to the market structure, firm size, race and gender (Cavalluzzo and Cavalluzzo, 1998; Storey, 2004; Blanchflower et al., 2003). Unlike these studies, we present evidence for an additional factor, monetary policy, that widens credit market discrimination. This result helps policymakers to be more vigilant in formulating policies and to reduce both economic and social costs. Further, this result has more significance in the current period since governments throughout the world are working hard to reduce gender disparities by introducing policies and regulations such as equal pay legislation, a quota for women's political representation, and financial support.

Further, our study also contributes to the literature that focuses on the impact of gender equality on economic development (Klasen and Lamanna, 2009; Agénor and Canuto, 2012; Bandara 2015). Previous studies show that gender equality promotes economic growth through education, labour force participation, time allocation, and bargaining power. Our empirical result shows that gender equality improves women's access to external finance even during a contractionary period. Since finance is one of the main factors that help smooth operations of firms (Beck et al. 2005; Klapper et al., 2006; Banerjee and Duflo, 2014), providing better access will help to improve the performance of female-run firms which in turn contributes to economic growth.

The remainder of this paper is organized as follows. Section 2 presents related literature. Section 3 explains the dataset and variable construction. Section 4 discusses the empirical framework of the study. Section 5 presents our empirical findings. Finally, Section 6 concludes the study.

2. Related literature

Monetary policy affects the credit market either through bank lending or the balance sheet channel. The supporters of the bank lending channel (Gertler and Gilchrist, 1993, 1994; Kashyap and Stein, 1995) suggests that an expansionary policy increases the supply of loans. If the bank assets are not a perfect substitute for each other, Kashyap et al. (1996) show that monetary policy has a significant effect on the credit supply. Bernanke and Gertler (1989) argue that monetary contraction reduces firm value and makes loans more expensive. Besides, a monetary tightening may cause credit rationing in the economy and funds might be channelized only to reputed or large firms, which is called the flight to quality (Bernanke et al., 1996). This may further reduce the future profit of some firms forcing them to be in more financial crunch.

One stream of studies highlights that female-run enterprises may face higher obstacles in the financial market due to the general preconception about their inferior entrepreneurial skills (Langowitz and Minniti 2007; Strohmeyer et al., 2017; Presbitero et al., 2014). Additionally, the rejection rate of women's loan applications is relatively higher (Beck et al., 2018). Even competition may not eradicate such discrimination (Ferguson and Peters, 2000). There exists empirical evidence (Becker, 1957) that lenders are even willing to sacrifice profits to avoid a relationship with marginal groups. Moreover, financial institutions charge unfavourable interest rates and reduce the loan terms for approved loans. As a result, sometimes women are discouraged from applying for funding (Aristei and Gallo, 2016). This result could possibly be due to the fact that women are less financially literate and less risk-tolerant. Another stream of studies finds that there is no discrimination in the credit market for women (Cavalluzzo and Cavalluzzo, 1998, Blanchflower et al., 2003; Storey 2004; Aterido et al., 2013) and some reports show that they receive more credit than men (Hansen and Rand, 2014; De Mel et al., 2009).

3. Data and variables

We use cross-country firm-level data from the World Bank Enterprise Survey (WBES). This dataset provides information on the business environment, competition, investment climate, corruption, access to finance and firm performance of non-agricultural firms. The data is collected by stratified random sampling with a replacement for firms belonging to the manufacturing, retail and services sectors (Dethier et al., 2011). Initially, different waves of surveys were not conducted in uniform intervals or different years were chosen for different countries. Additionally, repeated surveys in the same country may not be carried out on the same firms. However, recently the WBES has provided the panel version of enterprise surveys for the Eastern Europe & Central Asia countries (for the years 2008, 2009, 2012, 2013, 2018 and 2019) and the Middle East & North Africa countries (for the year 2013, 2016 and 2019). Since our objective is to identify the causation between credit market gender discrimination and monetary policy, we exclude firms that were surveyed only one time. Further, we drop firms with missing observations on the financial constraint measures and other firm-level controls.

The main explanatory variables in our study are the monetary policy measure and gender gap measure. The information on the former is obtained from the International Monetary Fund database and the information on the latter is collected from the World Economic Forum. In our study, we drop those countries without information on the gender gap and policy measures. After the cleaning process, we have 3321 observations from 18 countries in our final dataset. The list of countries along with the number of observations is provided in Table 1.¹

Using the WBES data, we construct several firm-level variables for our empirical analysis. The dependent variable in our study is 'change in financial constraints'. For that, we first construct a credit constraint measure. This measure takes value 1 for constrained firms which satisfy either of two conditions: i) those firms which report that they have applied for a loan in the last year but no outstanding loan this year (it is assumed that the loan which they have applied has been rejected); and ii) those firm which report that they did not apply for a loan in the past year due to complex procedures, unfavorable interest rates, and high collateral requirements. It takes value 0 for the unconstrained firm which satisfies either of the conditions: i) those firms which report that

they have applied for a loan in the last year, and they have an outstanding loan in this year (it is assumed that the loan has been approved); ii) those firms that have not applied for a new loan since they do not require a loan.² From this measure, we construct an ordinal variable that takes value 1 if an unconstrained firm in the first survey becomes constrained in the preceding survey; 0 if the constrained category of the firm remains unchanged; and -1 if a constrained firm in the first survey become unconstrained in the preceding survey ($\Delta Constrained$). For the robustness check, we use an alternative measure as a dependent variable. This measure is based on the survey question that captures the degree of obstacle to access external funds. The firms respond to this question as no obstacle, minor obstacle, moderate obstacle, major obstacle, and very severe obstacle.³ We use this information and construct a new measure that takes values 1, 0 and -1 for those firms whose degree of the obstacle is increased, remains the same and decreased, respectively ($\Delta Constrained2$).

Another firm-level explanatory variable in the study is the gender of the owner. It is hard to segregate female-owned firms from the WBES dataset. We have information only on "Amongst the owners of the firm, are there any females?". This information cannot be used directly (Asiedu et al., 2013) since even if a small portion of the firm is owned by a female, the firm may respond 'yes' to this question. However, these women may or may not have any role in the process of decision-making. To cope with this issue, we consider female-owned firms as: (i) those enterprises that are owned by a single person and have female ownership, (ii) at least 50 % of the firm is owned by the female or the largest owner is a female.⁴ Based on this classification, we construct a dummy variable that takes value 1 if the firm is owned by the female; zero otherwise (*Female*). To check the consistency of our result, we create an alternative variable for a female-managed firm (*Female Manager*) - takes value 1 if the firm is managed by women; zero otherwise.

One of the main macroeconomic explanatory variables is the monetary policy measure. Since different countries use different policy instruments, we take 'change in money market rate' as a monetary policy variable ($\Delta Policy Measure$). The other main macroeconomic explanatory variable is the gender gap (or equality) measure - *Global Gender Gap Index (GGGI)*. It captures the extent of gender gaps among four dimensions - economic, educational, health and political empowerment. In other words, the GGGI is the average of sub-indices on *Economic Participation and Opportunity Index (EPOI)*, *Educational Attainment Index, Health and Survival Index (HSI)*, and *Political Empowerment Index (PEI)*. The range of the index lies between zero (perfect inequality) and one (perfect equality). We also include these sub-indices in the empirical analysis.

Our firm-level control variables are as follows. *Age* is the year since the firm began its operation (in log). *Size* is calculated as a log of the number of employees in the firm (in log). *Sole* is a dummy variable that takes value 1 if the firm is owned by a single person. *Subsidiary* is a dummy variable that takes value 1 if the firm belongs to a larger group; zero otherwise. *Foreign* is a dummy variable that takes value 1 if 50 % or more share is owned by foreign entities; zero otherwise. *Export* is a dummy variable that takes value 1 for exporting firms; zero otherwise. *FinAud* is a dummy variable that takes value 1 for the firms that engage in financial auditing; zero otherwise. In addition to that, we include macroeconomic variables such as *GDP growth*, *domestic credit to private sector* and *inflation* as controls. Table 2 presents the descriptive statistics of these variables.

Table 1
List of countries and number of observations.

Country	Freq.	Percent
Armenia	271	8.16
Bulgaria	149	4.49
Croatia	37	1.11
Czech Republic	71	2.14
Georgia	183	5.51
Jordan	113	3.4
Kyrgyz Republic	170	5.12
Lithuania	37	1.11
Moldova	170	5.12
Mongolia	290	8.73
Morocco	86	2.59
Poland	168	5.06
Romania	193	5.81
Russian Federation	597	17.98
Serbia	251	7.56
Slovenia	91	2.74
Tajikistan	133	4
Ukraine	311	9.36
Total	3,321	100

¹ Number of firms in each country by year is presented in Table A1 (appendix).

² The financial constraint variable is constructed using survey questions k8, k16 and k17.

³ This measure is constructed using survey question k30. Number of observation in each category by male and female are presented in Table A2 (appendix).

⁴ This measure is constructed using survey question b4, b1, _wave2_wave3_b4a and _wave2_ECAz14

Table 2
Descriptive statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max
Δ Constrained	3,321	0.03	0.62	-1.00	1.00
Female	3,321	0.25	0.43	0.00	1.00
Female Manger	3,319	0.22	0.41	0.00	1.00
Δ Policy Measure	3,321	-1.17	4.30	-9.21	11.57
GGGI	3,321	0.70	0.03	0.61	0.74
Δ GGGI	3,206	0.01	0.02	-0.04	0.03
EPOI	3,321	0.69	0.09	0.41	0.83
EAI	3,321	0.99	0.02	0.90	1.00
HSI	3,321	0.97	0.01	0.95	0.98
PEI	3,321	0.13	0.06	0.06	0.28
Age	3,321	2.85	0.57	0.69	5.04
Size	3,321	3.19	1.23	0.69	7.84
Sole	3,321	0.13	0.33	0.00	1.00
Subsidiary	3,321	0.07	0.25	0.00	1.00
Foreign	3,321	0.06	0.23	0.00	1.00
Export	3,321	0.23	0.42	0.00	1.00
Audit	3,321	0.35	0.48	0.00	1.00
GDP Growth	3,321	3.99	2.83	-1.03	11.65
Credit to Private Sector	3,321	48.46	16.74	11.58	87.75
Inflation	3,321	3.95	2.34	-0.67	9.38

Note: Δ indicates 'change' in the variable. GGGI is the Global Gender Gap Index. EPOI is the Economic Participation and Opportunity Index, EAI is the Educational Attainment Index, HSI is the Health and Survival Index, and PEI is the Political Empowerment Index.

4. Empirical Framework

To investigate the impact of monetary policy on credit market discrimination, we estimate the following regression model:

$$\Delta \text{Constrained}_{i,c,t} = \alpha + \beta \text{Female}_{i,c,t} + \gamma \Delta \text{Policy Measure}_{c,t} + \delta \text{Female}_{i,c,t} * \Delta \text{Policy Measure}_{c,t} + \mathbf{Z} + u_{i,c,t} \quad (1)$$

where, subscript i, c and t refer to firm, country and year respectively. $\Delta \text{Constrained}$ is an ordinal variable that takes values 1, 0 and -1 if the financial constraint of a firm has increased, remain the same, and decreased, respectively. *Female* is the owner's gender. $\Delta \text{Policy Measure}$ is a proxy for change in monetary policy. $\mathbf{Z}$ is the vector of other firm-specific variables, macroeconomic controls, country-fixed effects, and time-fixed effects. Since our dependent variable is ordinal in nature, ordered probit estimation is used. Our main variable of interest is the interaction between *Female* and $\Delta \text{Policy Measure}$. We expect the coefficient of the interaction term (δ) to be negative, i.e., women enterprises find more difficulties to obtain loan during the tight monetary policy period. For inference, standard errors are clustered at the country-level.

To examine the impact of gender equality to offset credit market discrimination during a tight monetary policy period, we estimate the following ordered probit model:

$$\begin{aligned} \Delta \text{Constrained}_{i,c,t} = & \alpha + \beta \text{Female}_{i,c,t} + \gamma \Delta \text{Policy Measure}_{c,t} + \delta \text{GGGI}_{c,t} + \delta \text{Female}_{i,c,t} * \\ & \Delta \text{Policy Measure}_{c,t} + \omega \text{Female}_{i,c,t} * \text{GGGI}_{c,t} + \theta \Delta \text{Policy Measure}_{c,t} * \text{GGGI}_{c,t} + \theta \text{Female}_{i,c,t} * \\ & \Delta \text{Policy Measure}_{c,t} * \text{GGGI}_{c,t} + \mathbf{Z} + u_{i,c,t} \end{aligned} \quad (2)$$

Where GGGI is the Global Gender Gap Index which measures the gender gap (equality) in each country. The main interest of this analysis is the triple interaction between gender of the owner, monetary policy

change and gender gap index. If the discrimination of women in the credit market during the tight monetary policy is merely prejudicial, we expect a negative value for θ .

5. Results

5.1. Monetary policy and credit market discrimination

Table 3 presents the estimation results of different specifications of Eq. (1) to study the impact of monetary policy on the financial constraints of female-owned firms. In Column 1, we regress financial constraint measure ($\Delta \text{Constrained}$) on gender of the owner (*Female*), monetary policy measure ($\Delta \text{Policy Measure}$) and their interaction. In Column 2-5, we introduce time dummies, country dummies, firm-level control variables and macroeconomic control measures stepwise (respectively). We find that the coefficient of the interaction term turns out to be positive and statistically significant irrespective of the model specifications. It indicates that during a tight monetary policy period, female-owned firms are less likely to get funds from financial institutions than male-owned firms. This finding suggests that gender discrimination in the credit market widens during the tight monetary policy period.

We used coefficient only to understand the direction of the causation since its magnitude cannot be interpreted directly (Ai and Norton, 2003; Greene, 2010). To understand the magnitude of policy effect on the credit market gender discrimination, we present the marginal effects in Fig. 1. The x-axis in each subgraph represents the changes in monetary policy variable and the y-axis represents differences in the probabilities between female- and male-owned firms. The top-left, top-right and bottom graphs are for those firms that report their access to finance is

increased ($\Delta \text{Constrained} = 1$), remain same ($\Delta \text{Constrained} = 0$) and decreased ($\Delta \text{Constrained} = -1$). We observe that the probability of female-owned (as compared to male-owned) to being in $\Delta \text{Constrained} = 1$ category increases as monetary policy tightens. Another interesting observation is that when there is a monetary easing, i.e., $\Delta \text{Policy Measure} < 0$, the 'differences in the probability' is negative. It implies that monetary easing not only reduces the financial constraints of female-owned firms, but also it increases their probability to acquire more funds than male-owned firms. One implication of this result is that the burden of contractionary monetary policy falls more on female-owned firms rather than male-owned firms. Further, the probability of both male- and female-owned firms being in $\Delta \text{Constrained} = 0$ category remains almost the same after the policy. However, the relative probability of the female-owned firms being in $\Delta \text{Constrained} = -1$ category reduces when the policy rate increases. That is, during monetary policy tightening, the probability of improving credit access to

female-owned firms is falling as compared to male-owned firms. Additionally, we also find monetary easing ($\Delta \text{Policy Measure} < 0$) will improve the probability of female-owned firms' access to credit compared to male-owned firms.

Table 3

The impact of monetary policy on credit market gender discrimination.

Variable	(1) $\Delta Constrained$	(2) $\Delta Constrained$	(3) $\Delta Constrained$	(4) $\Delta Constrained$	(5) $\Delta Constrained$
Female* Δ Policy Measure	0.0328*** (0.00647)	0.0332*** (0.00641)	0.0313*** (0.00629)	0.0315*** (0.00613)	0.0315*** (0.00598)
Female	0.0401 (0.0565)	0.0419 (0.0555)	0.0251 (0.0452)	0.0233 (0.0454)	0.0215 (0.0442)
Δ Policy Measure	-0.00642 (0.00770)	-0.00357 (0.00977)	-0.00812 (0.0102)	-0.00828 (0.00991)	-0.00221 (0.0167)
Age				0.0493 (0.0414)	0.0507 (0.0434)
Size				0.000261 (0.0208)	0.00235 (0.0207)
Sole				-0.0139 (0.0437)	-0.0121 (0.0549)
Subsidiary				-0.0383 (0.0601)	-0.0312 (0.0572)
Foreign				-0.0642 (0.0925)	-0.0719 (0.0920)
Export				0.0805* (0.0475)	0.0768 (0.0473)
Audit				-0.0604 (0.0661)	-0.0615 (0.0650)
GDP Growth					-0.0291 (0.0362)
Credit to Private Sector					0.00419 (0.00566)
Inflation					0.0186 (0.0444)
Time dummies	No	Yes	Yes	Yes	Yes
Country dummies	No	No	Yes	Yes	Yes
Observations	3,321	3,321	3,321	3,321	3,321
Pseudo R-squared	0.0015	0.0018	0.0130	0.0141	0.0154

Note: This table reports the estimation result of Eq. (1) using the ordered probit methodology. Standard errors in parentheses are clustered at the country-level. '***', '**' and '*' indicate 1 %, 5 % and 10 % significance level.

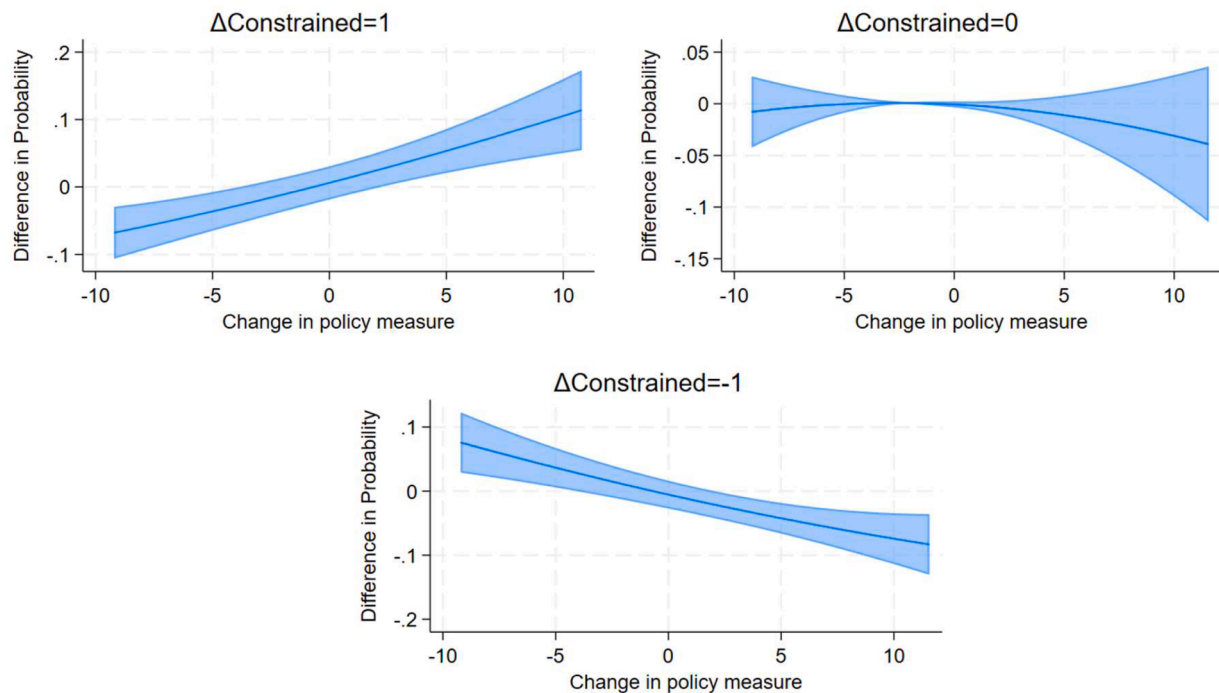


Fig. 1. Marginal effects: monetary policy and credit market gender discrimination. Note: The x-axis represents the differences in the probabilities among female- and male-owned firms falling in each credit-constrained category. The y-axis represents the change in monetary policy measures. $\Delta Constrained = 1$ represents those firms whose financial constraints are increased, $\Delta Constrained = 0$ represents those firms whose financial constraints are decreased, and $\Delta Constrained = -1$ represents those firms whose financial constraints are decreased.

Table 4

Monetary Policy, Credit Market Discrimination and Gender Gap.

Variable	(1) $\Delta\text{Constrained}$	(2) $\Delta\text{Constrained}$	(3) $\Delta\text{Constrained}$	(4) $\Delta\text{Constrained}$	(5) $\Delta\text{Constrained}$	(6) $\Delta\text{Constrained}$
Female* $\Delta\text{Policy Measure}$ *GGGI	-0.907** (0.429)	-0.920** (0.435)	-0.804* (0.427)	-0.851** (0.423)	-0.861** (0.425)	
Female* $\Delta\text{Policy Measure}$ * ΔGGGI						-1.496** (0.626)
Female	3.025*** (0.924)	3.050*** (0.946)	2.744*** (1.009)	2.775*** (1.007)	2.762*** (0.993)	0.100* (0.0519)
$\Delta\text{Policy Measure}$	-0.426** (0.196)	-0.395* (0.202)	-0.447 (0.394)	-0.436 (0.393)	-0.520 (0.371)	0.0774** (0.0336)
Female* $\Delta\text{Policy Measure}$	0.676** (0.311)	0.686** (0.315)	0.601* (0.310)	0.635** (0.307)	0.642** (0.309)	0.0604*** (0.0164)
GGGI	-0.765 (1.407)	-0.755 (1.421)	-7.596** (3.268)	-7.640** (3.282)	-8.891** (3.821)	
Female*GGGI	-4.243*** (1.300)	-4.276*** (1.330)	-3.871*** (1.417)	-3.915*** (1.415)	-3.899*** (1.395)	
$\Delta\text{Policy Measure}$ *GGGI	0.592** (0.276)	0.552* (0.282)	0.627 (0.557)	0.613 (0.555)	0.746 (0.532)	
ΔGGGI						5.687 (5.237)
Female* ΔGGGI						-5.699*** (1.926)
$\Delta\text{Policy Measure}$ * ΔGGGI						-4.377** (1.738)
Firm-level controls	No	No	No	Yes	Yes	Yes
Macroeconomic controls	No	No	No	No	Yes	Yes
Time dummies	No	Yes	Yes	Yes	Yes	Yes
Country dummies	No	No	Yes	Yes	Yes	Yes
Observations	3,321	3,321	3,321	3,321	3,321	3,206
Pseudo R-squared	0.0045	0.0046	0.0160	0.0170	0.0178	0.0200

Note: This table reports the estimation result of Eq. (2) using the ordered probit methodology. Standard errors in parentheses are clustered at the country-level. ****, *** and ** indicate 1 %, 5 % and 10 % significance level.

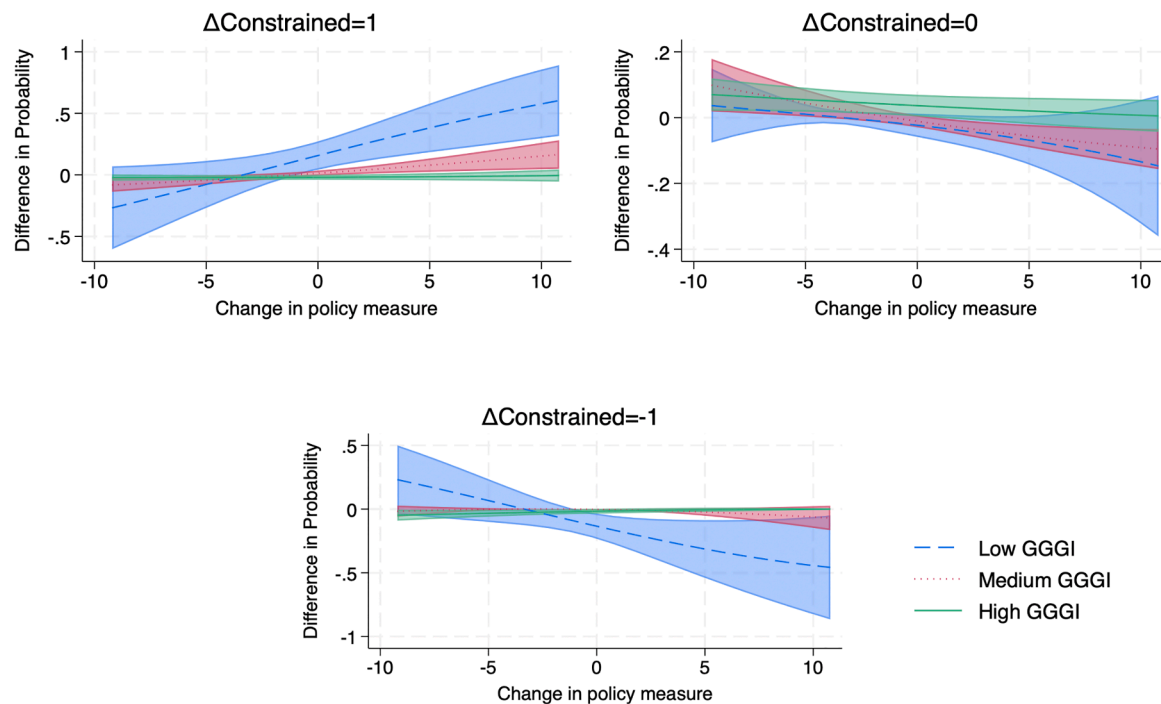


Fig. 2. Marginal effects: monetary policy, credit market discrimination and gender gap. Note: The x-axis represents the differences in the probabilities among female- and male-owned firms falling in each credit-constrained category. The y-axis represents the change in monetary policy measures. $\Delta\text{Constrained} = 1$ represents those firms whose financial constraints are increased, $\Delta\text{Constrained} = 0$ represents those firms whose financial constraints are decreased, and $\Delta\text{Constrained} = -1$ represents those firms whose financial constraints are decreased. Low GGGI is the minimum value in the data, medium GGGI is the average value, and high GGGI is the highest value in the data.

5.2. Monetary policy, credit market discrimination, and gender gap

Our next set of analyses is to explore the role of gender gap (or equality) in the credit market discrimination during contractionary policy period. For that, we estimate Eq. (2) and present our findings in Table 4. We begin with a most parsimonious model in Column 1 and then we introduce control measures stepwise in Column 2–5. The focus of this analysis is the coefficient of $\text{Female} \times \Delta \text{Policy Measure} \times \text{GGGI}$. The coefficient of triple interaction is negative and statistically significant in each specification. It indicates that during the monetary policy contractionary period, female-owned firms are less likely to face financial constraints in a country with less gender disparity. In other words, the credit market gender discrimination is relatively lower at the time of monetary tightening if the level of gender equality is higher. This finding remains consistent while employing a change in GGGI (ΔGGGI) in our model (Column 6). Fig. 2 reports the marginal effects of monetary policy in low, medium and high GGGI countries. It indicates that the probability of female-owned firms being in $\Delta \text{Constrained} = 1$ category is higher at the time of tight monetary policy in a country with a higher gender gap. However, they being in $\Delta \text{Constrained} = -1$ category during tight policies are relatively higher in medium and high GGGI countries compared to low GGGI countries. Our result has an implication that gender equality helps for the equal distribution of funds, which in turn stimulates productivity and economic growth.

Although the paper focuses only on 18 countries, the conclusions drawn from the study have broader implications in the context of other developing and developed countries. The global gender gap report shows the existence of a gender gap among both developed and developing nations and it will take 131 years to reach full parity. Currently, countries in different geographical regions – Europe (76.3 %), North America (75 %), Latin America & Caribbean (74.3 %), Eurasia and Central Asia (69 %), East Asia & Pacific (68.8 %), Sub-Saharan Africa (68.2 %), Southern Asia (63.4 %), and Middle East & North Africa (62.6 %) – are far away from the full parity. Therefore, women all over the globe may face difficulty in obtaining external loans and this hurdle will be more at the time of contractionary period.

5.3. Robustness check

The existing studies on gender discrimination in the credit market are also discussed in the context of female-managed firms (Muravyev et al., 2009). Therefore, we replicate the above analysis on female-managed firms. Table 5 presents the estimation result of Eqs. (1) and (2) using *Female Manager* instead of *Female*. Column 1 suggests that monetary contraction increases the financial constraints of

female-managed firms as compared to male-managed firms. Column 2 and 3 indicate that this discrimination is relatively lower in gender-equal countries. These results remain consistent with our main finding. Second, we use an alternative proxy for financial constraints, i. e., $\Delta \text{Constrained2}$. Column 4 and 5 present the estimation result of Eq. (2) using the new measure of credit constraints. The results are qualitatively similar to our main findings. Finally, we address the issue of endogeneity using Lewbel (2012) methodology. This method helps to resolve the problem of endogeneity in the absence of an external instruments by constructing them using the exogenous variable in the model. It first run a regression of endogenous variable on a vector of the exogenous variable (X) and then obtain the residuals (ϵ). Next, valid instruments are generated as $(X - \bar{X})\epsilon$, where $\bar{X}$ is the mean value of X . These instruments are used to estimate Eq. (1). To check the over-identification problem, we resort to the Hansen-J test. The results presented in Column 6 and 7 are qualitatively similar to our main findings.

5.4. Sub-indices

Further, we explore which type of gender equality is more relevant in our context. As explained in the data section, GGGI is constructed using 4 subindices which capture gender equality in economic, educational, health and political domains. This section aims to investigate which domain is dominating in the alleviation of credit market discrimination led by monetary policy. For that purpose, we re-estimate Eq. (2) using the sub-indices of GGGI and present findings in Table 6. In the case of female-owned firms, our triple interaction term is significant only for political gender equality. One possible explanation is that higher political gender equality indicates that more women are part of economic policymaking. Therefore, it is more likely that there will be policies, such as micro finances, etc., which target the improvement of women's access to finance. In the case of female-managed firms, we find a significant effect of educational and political gender equality to eradicate discrimination in the credit market. These results remain robust even if we insert 4 subindices together in the model (not reported due to brevity, available on request).

5.5. SMEs

Small and medium enterprise finds it more difficult to obtain external funds (Beck and Demirguc-Kunt, 2006; Kuntchev et al. 2012; Konte and Ndubuisi, 2021). Together with credit market discrimination, female-owned small firms might face huge constraints in the market. Given that, in our final set of analyses, we analyze the differential effect

Table 5
Robustness Check.

Variable	(1) $\Delta \text{Constrained}$	(2) $\Delta \text{Constrained}$	(3) $\Delta \text{Constrained}$	(4) $\Delta \text{Constrained2}$	(5) $\Delta \text{Constrained2}$	(6) $\Delta \text{Constrained}$	(7) $\Delta \text{Constrained}$
Female Manager * $\Delta \text{Policy Measure}$	0.0325*** (0.00568)	0.932*** (0.263)	0.0619*** (0.0147)				
Female Manager * $\Delta \text{Policy Measure} \times \text{GGGI}$		-1.271*** (0.368)					
Female Manager * $\Delta \text{Policy Measure} \times \Delta \text{GGGI}$			-1.531* (0.805)		-0.896** (0.404)		
Female * $\Delta \text{Policy Measure}$						0.019*** (0.006)	
Female * $\Delta \text{Policy Measure} \times \text{GGGI}$				-0.910* (0.551)			-0.567* (0.290)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,319	3,319	3,204	3,219	3,217	3321	3321
Hansen j (p-value)						0.73	0.103
Pseudo R-squared	0.0154	0.0175	0.0202	0.0251	0.0255	0.0280	0.0323

Note: Standard errors in parentheses are adjusted for clustering at the country-level. '***', '**' and '*' indicate 1 %, 5 % and 10 % significance level.

Table 6
Subindices.

Variable	Δ Constrained	Δ Constrained	Δ Constrained	Δ Constrained	Δ Constrained	Δ Constrained	Δ Constrained	Δ Constrained
Female* Δ Policy Measure*EPOI	-0.192 (0.235)							
Female* Δ Policy Measure*EAI		-1.384 (0.967)						
Female* Δ Policy Measure*HSI			-0.254 (1.315)					
Female* Δ Policy Measure*PEI				-0.306** (0.145)				
Female Manager* Δ Policy Measure*EPOI					-0.356 (0.272)			
Female Manager* Δ Policy Measure*EAI						-2.221*** (0.825)		
Female Manager* Δ Policy Measure*HIS							-1.262 (1.088)	
Female Manager* Δ Policy Measure*PEI								-0.400*** (0.123)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,321	3,321	3,321	3,321	3,319	3,319	3,319	3,319
Pseudo R-squared	0.0174	0.0204	0.0185	0.0166	0.0169	0.0188	0.0203	0.0169

Note: *GGGI* is the Global Gender Gap Index. *EPOI* is the Economic Participation and Opportunity Index, *EAI* is the Educational Attainment Index, *HSI* is the Health and Survival Index, and *PEI* is the Political Empowerment Index. Standard errors in parentheses are clustered at the country-level. ‘***’, ‘**’ and ‘*’ indicate 1 %, 5 % and 10 % significance level.

Table 7
Size classification.

Variable	Small	Medium	Large
	Δ Constrained	Δ Constrained	Δ Constrained
Female* Δ Policy Measure	0.0193** (0.00855)	0.0532*** (0.0106)	0.0118 (0.0208)
Female	0.0167 (0.0487)	0.0186 (0.0710)	0.0226 (0.182)
Δ Policy Measure	-0.0128 (0.0116)	0.0149 (0.0241)	0.0126 (0.0256)
Firm-level controls	Yes	Yes	Yes
Macroeconomic controls	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Observations	1,561	1,174	485
Pseudo R-squared	0.0256	0.0204	0.0323

Note: firms with less than 10 employees as small firms; firms with greater than or equal to 10 and less than 100 employees as medium firms; and other firms as large firms. Standard errors in parentheses are adjusted for clustering at the country-level. ‘***’, ‘**’ and ‘*’ indicate 1 %, 5 % and 10 % significance level.

of monetary policy on small, medium, and large firms. Following the World Bank size classification, we define firms with less than 10 employees as small firms; firms with greater than or equal to 10 and less than 100 employees as medium firms; and other firms as large firms. [Table 7](#) reports our estimation result for different size classes. We find that the adverse effect of monetary contraction falls heavily on small and medium firms. This result is not surprising since large firms usually have better track records and sound collaterals for finding external fund. Therefore, they do not often face discrimination in the credit market even if the enterprise is headed by women.

6. Conclusion

Gender equality is one of the components of the Sustainable

Appendix

[Tables A1](#) and [A2](#).

Development Goal. Women’s involvement in economic activities helps to stimulate economic growth and development. One of the main hindrances that women face is credit market discrimination- they are less likely to receive external funds compared to men. This study explores the role of monetary policy in widening credit market discrimination. Generally, economic agents receive less amount of funds during a contractionary period. Therefore, it is imperative to know whether the access to finance for female-run businesses further worsen after a tight monetary policy. We use firm-level data from 18 countries, and we find that female-owned firms face higher financial constraints than male-owned firms during a monetary contraction period. The finding is applicable to both female-owned and managed firms. We also find small and medium firms are affected more than the large firms. Further, we extended our analysis to investigate the role of gender equality to offset the widening of credit market discrimination. We find that female-run firms face relatively less financial constraints in a country with a higher level of gender equality (or lower gender gap) during a time of tight monetary policy. Although we carried out several robustness tests, our study suffers from certain limitations. The number of firms in each country is low and may lack representativeness. This issue will be addressed in the future research with more nuanced data.

Declaration of Competing Interest

None.

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Table A1
Number of firm in each country by year.

Country name	Year	Number of firms
Armenia	2013	162
Armenia	2019	109
Bulgaria	2013	63
Bulgaria	2019	86
Croatia	2013	37
Czech Republic	2013	16
Czech Republic	2019	55
Georgia	2013	77
Georgia	2019	106
Jordan	2019	113
Kyrgyz Republic	2013	36
Kyrgyz Republic	2019	134
Lithuania	2013	37
Moldova	2013	170
Mongolia	2013	125
Mongolia	2019	165
Morocco	2019	86
Poland	2013	15
Poland	2019	153
Romania	2013	89
Romania	2019	104
Russian Federation	2012	123
Russian Federation	2019	474
Serbia	2013	115
Serbia	2019	136
Slovenia	2013	91
Tajikistan	2013	34
Tajikistan	2019	99
Ukraine	2013	164
Ukraine	2019	147

Table A2
Number of firms report the degree of obstacles to receive external funds.

	Full sample	Male	Female
No obstacle	1,243	944	299
Minor obstacle	599	458	141
Moderate obstacle	763	542	221
Major obstacle	461	361	100
Very severe obstacle	207	155	52
Total	3,273	2,460	813

References

- Agénor, P.R., Canuto, O., 2012. *Access to infrastructure and women's time allocation: Evidence and a framework for policy analysis* (No. P45). FERDI Working Paper.
- Ai, C., Norton, E.C., 2003. Interaction terms in logit and probit models. *Econ. Lett.* 80 (1), 123–129.
- Albertazzi, U., Nobili, A., Signoretti, F.M., 2021. The bank lending channel of conventional and unconventional monetary policy. *J. Money Credit Bank.* 53 (2-3), 261–299.
- Alesina, A.F., Lotti, F., Mistrulli, P.E., 2013. Do women pay more for credit? Evidence from Italy. *J. Eur. Econ. Assoc.* 11, 45–66.
- Arrow, K., 1973. The theory of discrimination. In: Ashenfelter, O., Rees, A. (Eds.), *Discrimination in Labor Markets*. Princeton University Press, Princeton, N.J., pp. 3–33.
- Aristei, D., Gallo, M., 2016. Does gender matter for firms' access to credit? Evidence from international data. *Fin. Res. Lett.* 18, 67–75.
- Asiedu, E., Kalonda-Kanyama, I., Ndikumana, L., Nti-Addae, A., 2013. Access to credit by firms in Sub-Saharan Africa: how relevant is gender? *Am. Econ. Rev.* 103 (3), 293–297.
- Aterido, R., Beck, T., Iacovone, L., 2013. Access to finance in Sub-Saharan Africa: is there a gender gap? *World Dev.* 47, 102–120.
- Ayyagari, M., Demirgüç-Kunt, A., Maksimovic, V., 2011. Firm innovation in emerging markets: the role of finance, governance, and competition. *J. Financ. Quant. Anal.* 46 (6), 1545–1580.
- Bandara, A., 2015. The economic cost of gender gaps in effective Labor: Africa's missing growth reserve. *Fem. Econ.* 21 (2), 162–186.
- Banerjee, A.V., Duflo, E., 2014. Do firms want to borrow more? Testing credit constraints using a directed lending program. *Rev. Econ. Stud.* 81 (2), 572–607.
- Basistha, A., Kurov, A., 2008. Macroeconomic cycles and the stock market's reaction to monetary policy. *J. Bank. Finance* 32 (12), 2606–2616.
- Beck, T., Demirgüç-Kunt, A., 2006. Small and medium-size enterprises: access to finance as a growth constraint. *J. Bank. Finance* 30, 2931–2943. <https://doi.org/10.1016/j.jbankfin.2006.05.009>.
- Beck, T., Demirgüç-Kunt, A., Maksimovic, V., 2005. Financial and legal constraints to firm growth: does firm size matter? *J. Bank. Finance* 60 (1), 137–177.
- Beck, T., Behr, P., Madestam, A., 2018. Sex and credit: Do gender interactions matter for credit market outcomes? *J. Bank. Finance* 87, 380–396.
- Becker, Gary S., 1957. *The Economics of Discrimination*. University of Chicago Press, Chicago.
- Bellucci, A., Borisov, A., Zazzaro, A., 2010. Does gender matter in bank-firm relationships? Evidence from small business lending. *J. Bank. Finance* 34 (12), 2968–2984.
- Bernanke, B., Gertler, M., 1989. Agency costs, net worth, and business fluctuations. *Am. Econ. Rev.* 79 (1), 14–31.
- Bernanke, B.S., Gertler, M., 1995. Inside the black box: the credit channel of monetary policy transmission. *J. Econ. Perspect.* 9 (4), 27–48.
- Bernanke, B., Gertler, M., Gilchrist, S., 1996. The financial accelerator and the flight to quality. *Rev. Econ. Stat.* 78 (1), 1–15.
- Blanchflower, D.G., Levine, P.B., Zimmerman, D.J., 2003. Discrimination in the small-business credit market. *Rev. Econ. Stat.* 85 (4), 930–943.
- Bräuning, F., Ivashina, V., 2020. US monetary policy and emerging market credit cycles. *J. Monet. Econ.* 112, 57–76.

- Cavalluzzo, K.S., Cavalluzzo, L.C., 1998. Market structure and discrimination: the case of small businesses. *J. Money Credit Bank.* 771–792.
- Chava, S., Hsu, A., 2020. Financial constraints, monetary policy shocks, and the cross-section of equity returns. *Rev. Finance Stud.* 33 (9), 4367–4402.
- De Mel, S., McKenzie, D., Woodruff, C., 2009. Are women more credit constrained? Experimental evidence on gender and microenterprise returns. *Am. Econ. J. Appl. Econ.* 1 (3), 1–32.
- Demiralp, S., Eisenschmidt, J., Vlassopoulos, T., 2021. Negative interest rates, excess liquidity and retail deposits: Banks' reaction to unconventional monetary policy in the euro area. *Eur. Econ. Rev.* 136, 103745.
- Dethier, J.J., Hirn, M., Straub, S., 2011. Explaining enterprise performance in developing countries with business climate survey data. *World Bank Res. Obs.* 26 (2), 258–309.
- Ferguson, M.F., Peters, S.R., 2000. Is lending discrimination always costly? *J. Real Estate Finance Econ.* 21 (1), 23–44.
- Geromichalos, A., Herrenbrueck, L., 2016. Monetary policy, asset prices, and liquidity in over-the-counter markets. *J. Money Credit Bank.* 48 (1), 35–79.
- Gertler, M., Gilchrist, S., 1993. The role of credit market imperfections in the monetary transmission mechanism: arguments and evidence. *Scand. J. Econ.* 95 (1), 43–64.
- Gertler, M., Gilchrist, S., 1994. Monetary policy, business cycles, and the behavior of small manufacturing firms. *Q. J. Econ.* 109 (2), 309–340.
- Gertler, M., Karadi, P., 2015. Monetary policy surprises, credit costs, and economic activity. *Am. Econ. J. Macroecon.* 7 (1), 44–76.
- Greene, W., 2010. Testing hypotheses about interaction terms in nonlinear models. *Econ. Lett.* 107 (2), 291–296.
- Hall, B.H., Lerner, J., 2010. The financing of R&D and innovation. N. R. Bronwyn, H. Hall, ed. *Handbook of Innovation*, Vol. 1 of *Handbook of Economics*. Elsevier.
- Hansen, H., Rand, J., 2014. The myth of female credit discrimination in African manufacturing. *J. Dev. Stud.* 50 (1), 81–96.
- Kashyap, A.K., Stein, J.C., 1995. The impact of monetary policy on bank balance sheets. In *Carnegie-rochester conference series on public policy* 42, 151–195. North-Holland.
- Kashyap, A.K., Stein, J.C., Wilcox, D.W., 1996. Monetary policy and credit conditions: evidence from the composition of external finance: reply. *Am. Econ. Rev.* 86 (1), 310–314.
- Klapper, L., Laeven, L., Rajan, R., 2006. Entry regulation as a barrier to entrepreneurship. *J. Financ. Econ.* 82 (3), 591–629.
- Klasen, S., Lamanna, F., 2009. The impact of gender inequality in education and employment on economic growth: new evidence for a panel of countries. *Fem. Econ.* 15 (3), 91–132.
- Konte, M., Ndubuisi, G., 2021. Financial constraint, trust, and export performances: firm-level evidence from Africa. *J. Inst. Econ.* 17 (4), 583–605.
- Kuntchev, V., Ramalho, R., Rodríguez-Meza, J., Yang, J.S., 2012. What have we learned from the Enterprise Surveys regarding access to finance by SMEs. Enterprise Analysis Unit of the Finance and Private Sector Development. The World Bank Group.
- Kurov, A., 2010. Investor sentiment and the stock market's reaction to monetary policy. *J. Bank. Finance* 34 (1), 139–149.
- Kurov, A., Stan, R., 2018. Monetary policy uncertainty and the market reaction to macroeconomic news. *J. Bank. Finance* 86, 127–142.
- Langowitz, N., Minniti, M., 2007. The entrepreneurial propensity of women. *Entrep. Theory Pract.* 31 (3), 341–364.
- Lewbel, A., 2012. Using heteroscedasticity to identify and estimate mis-measured and endogenous regressor models. *J. Bus. Econom. Stat.* 30 (1), 67–80.
- Link, A.N., van Hasselt, M., 2019. Exploring the impact of R&D on patenting activity in small women-owned and minority-owned entrepreneurial firms. *Small Bus. Econ.* 1–6.
- Mascia, D.V., Rossi, S.P., 2017. Is there a gender effect on the cost of bank financing? *J. Financ. Stab.* 31, 136–153.
- Muravyev, A., Talavera, O., Schäfer, D., 2009. Entrepreneurs' gender and financial constraints: evidence from international data. *J. Comp. Econ.* 37 (2), 270–286.
- Phelps, E.S., 1972. The statistical theory of racism and sexism. *Am. Econ. Rev.* 659–661.
- Presbitero, A.F., Rabelotti, R., Piras, C., 2014. Barking up the wrong tree? Measuring gender gaps in firm's access to finance. *J. Dev. Stud.* 50 (10), 1430–1444.
- Storey, D.J., 2004. Racial and gender discrimination in the micro firms credit market?: Evidence from Trinidad and Tobago. *Small Bus. Econ.* 23 (5), 401–422.
- Strohmeyer, R., Tonoyan, V., Jennings, J.E., 2017. Jacks-(and Jills)-of-all-trades: on whether, how and why gender influences firm innovativeness. *J. Bus. Ventur.* 32 (5), 498–518.
- Takhtamanova, Y., Sierminska, E., 2009. Gender, monetary policy, and employment: the case of nine OECD countries. *Fem. Econ.* 15 (3), 323–353.
- Thébaud, S., 2015. Status beliefs and the spirit of capitalism: accounting for gender biases in entrepreneurship and innovation. *Soc. Forces* 94 (1), 61–86.