

## Do crises hit female-managed and male-managed firms differently? Evidence from the 2008 financial crisis<sup>1</sup>

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**W**hile efforts are currently in place to collect data on the economic consequences of the COVID-19 pandemic, this note looks at the experience of the 2008 financial crisis to gain insights on possible differential effects of crises on female and male entrepreneurs. Specifically, the note uses firm-level data collected immediately after the 2008 financial crisis in six countries in Eastern Europe and Central Asia (Bulgaria, Hungary, Latvia, Lithuania, Romania, and Turkey) to look at two aspects of the differential effect of the crisis. First, whether there is a difference in the exit rate for firms with male vs. female top managers; and second, whether, among firms that stayed in business, female-managed firms are affected disproportionately. Results show that firms run by female top managers are more likely to exit the market. Secondly, when able to stay in business, male and female-managed firms suffered a similar impact in the short term; however, female-managed firms suffered more than male-managed firms in the longer term.

### Introduction

The COVID-19 pandemic and the consequent transformation of the day-to-day life worldwide are posing unprecedented economic challenges to the private sector. Firms are closing or reducing their activities because of government restrictions, lack of demand, or lack of critical inputs or raw materials. While all firms are impacted, there is a growing debate about the possibility of disproportionately negative effects of the crisis on women entrepreneurs. As the World Bank and other institutions are collecting firm-level data to answer this question and, more generally, to assess the effects of the COVID-19 crisis on the private sector, we looked back at the experience of the 2008 financial crisis to get some insights on possible differential effects of crises on female-managed and male-managed firms. The results fill an evident gap in the literature and offer useful insights for the upcoming analysis of the COVID-19 data.

The literature on gender-disaggregated effects of crises has, so far, mainly focused on labor market outcomes with the bulk of the studies looking at the effects on the supply of labor from individuals (Benería, 2015; Seguino, 2010; Lahey and de Villota, 2013). Fewer studies have investigated the demand side. Lim (2000) looked at the effects of the East Asian crisis in the Philippines and found that while women were displaced more in the manufacturing sector, they overall suffered less from the crisis as sectors with high female employment such as

social and personal services, trade, and wholesale were hit less hard. Similar results are found by Hallward-Driemeier et al. (2017) that examined how variations in firms' responses during the East Asian crisis in Indonesia affected men's and women's relative employment vulnerability. They found that women experienced higher job losses than their male colleagues *within* the same firm. However, the aggregate adverse effect of such differential treatment was more than offset by women being disproportionately employed in firms hit relatively less by the crisis.

When moving out from the labor market lens and looking at the gender dimension of firms' adjustments during crises, the literature is even more limited. Cesaroni et al. (2015) analyzed the response of Italian micro-entrepreneurs to the 2008 economic crisis. They found that women entrepreneurs mainly dealt with the financial crisis with a defensive attitude and preferred downsizing their activities and increasing efficiency. Moreover, in Italy, female-owned firms were found to face a more pronounced tightening in credit supply during the crisis with respect to male-owned firms (Cesaroni et al. 2013). Additional studies looked at the effect of the financial crisis on firms overall. Hallward-Driemeier and Rijkers (2013), found that the crisis led to a spike in exits independently of the productivity levels of firms driven out of business. Moreover, they found a slowdown in entry and excessive employment reallocation. Firms more

vulnerable to changing credit market conditions were much more likely to exit during the crisis. Firm size has also been investigated as potential contributor to firm exit during an economic crisis. Results for Portugal suggest that large firms suffer a greater increase in exit hazard during downturns than smaller firms, although small firms remain generally more likely to exit. Size is less helpful in avoiding exits in a crisis context, as a large size may be responsible for firm inertia and an inability to adapt optimally to an adverse environment. Neither of the last two studies, however, looked at the gender dimension. When we shift our focus to the broader literature on firm exit, research through the gender lens is also very limited.<sup>2</sup> Klanins and Williams (2014) examined survival time of male-owned and female-owned businesses. Using Texas sales tax data, they found that female-owned businesses out-survive male-owned businesses in certain industries and geographic areas although generally female-owned businesses tend to be more short-lived. None of these studies have a cross-country perspective and it is clear that more research through the gender lens is needed. We try to fill this gap with the analysis presented in this note.

## Data and selected pre-crisis stylized facts

This analysis is based on a unique dataset collected to measure the effects of the 2008 financial crisis on firms. The Financial Crisis Survey (FCS) was conducted using phone interviews to re-visit firms that participated in – at the time recently conducted- 2008 Enterprise Surveys (ES). Interviews were carried out in three waves in six countries: Bulgaria, Hungary, Latvia, Lithuania, Romania, and Turkey.<sup>3</sup> The first wave was implemented during the months of June and July 2009. The other two waves, wave 2 and wave 3, were conducted in the months of February and March 2010, and May and June 2010, respectively. From the information collected during short phone interviews, indicators are computed to measure the effects of the crisis on key elements of the private economy: sales, employment, and finances. Using survey weights, all indicators make inferences to the broader population under consideration.

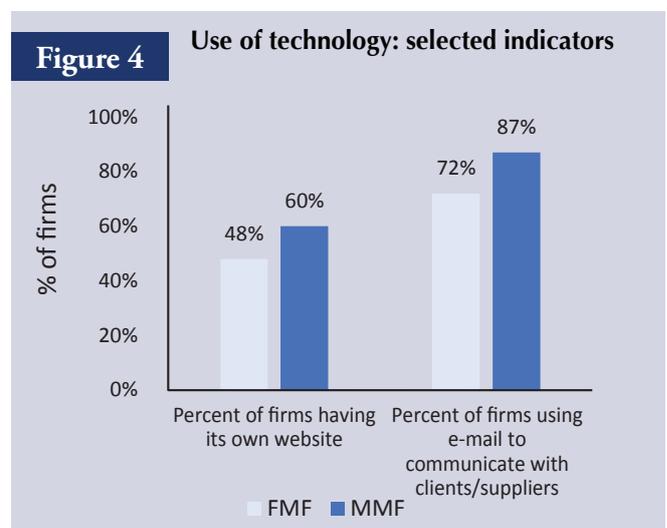
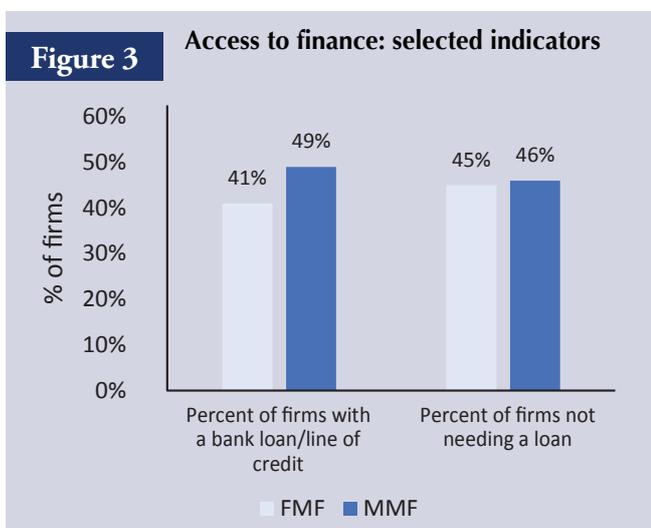
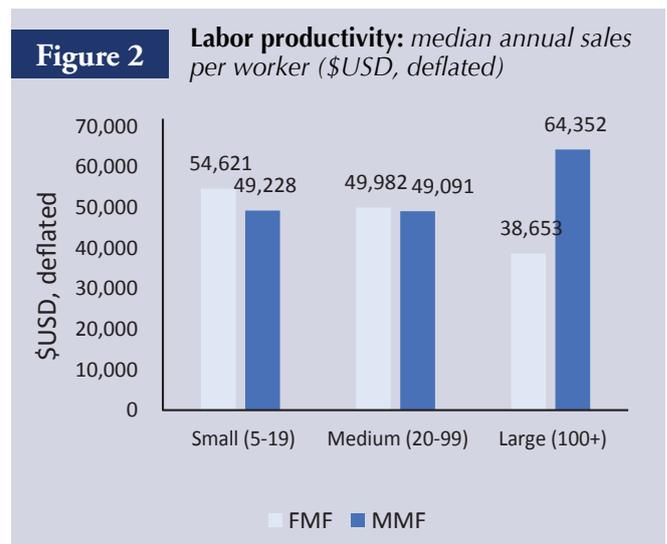
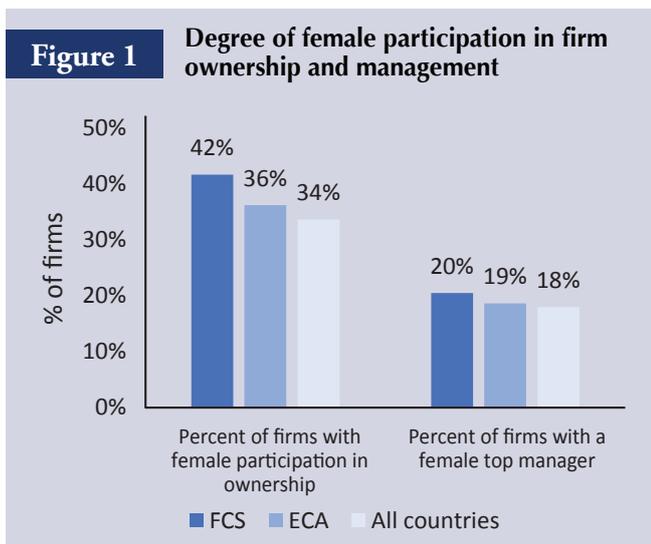
The original ES data also serve as baseline for comparisons since most of its questions refer to fiscal year 2007, thus measuring the pre-crisis scenario. The ES collect information on a representative sample of formal (registered) private firms with at least five employees operating in the manufacturing or services sectors. By using a global methodology based on stratified random sampling, the ES data are fully comparable across countries. Besides covering several aspects of the business environment and firms' outcomes, the ES also collect information on firms' characteristics, including questions on the gender of the firm's top manager, on whether firms have any women among the owners, and on the percentage of women in the workforce.

Before the crisis, in the six countries analyzed, on average 42 percent of firms had at least one woman among the owners and 20 percent of firms had a female top manager. Both figures are in line or higher than the average in the other countries in Europe and Central Asia (ECA) and equal to the average in all countries with ES data available (figure 1). Unfortunately, before 2009, the ES didn't systematically collect the percentage of female ownership in respondent firms. The absence of this key information prevents us from assessing the degree of female ownership in these firms. Because of this, the following analysis focuses on firms with a female top manager.<sup>4</sup>

Before the crisis, overall firms with a female top manager were as productive as firms with a male top manager. When looking at the full sample for all countries, labor productivity for female-managed firms (FMF) and male-managed firms (MMF), defined as annual sales per employee, was \$49,982 and \$50,347, respectively. The labor productivity of female-managed firms and male-managed firms was very similar for firms in retail and other services sectors and for small (5-19 employees) and medium firms (20-99 employees). However, firms with male top managers were more productive than firms with female top managers among large firms (100+ employees) (figure 2) and manufacturing firms.<sup>5</sup>

Access to finance is another key factor to consider as it enables firms to face downturns. Firms that have access to external finance may be able to mitigate the impacts of temporary shocks that would otherwise force them to exit. As presented in figure 3, selected indicators for access to finance for the full sample also show some differences between female-managed and male-managed firms. On average, 41 percent of firms with a female top manager had a bank loan or line of credit compared to 49 percent of firms managed by men<sup>6</sup>; on the contrary, the proportion of firms not needing a loan was very similar for female- and male-managed firms (45 percent and 46 percent, respectively). These patterns are confirmed across sectors and size.<sup>7</sup>

Finally, we looked at access to technology as it may lead to— or be a proxy for— levels of adaptability that may be essential for firms to avoid exiting the market during crises. ES data show that overall, at the time of the crisis, female-managed firms were less likely to use technology than male-managed firms. In 2008, in the full sample, 72 percent of firms with a female top manager used email in their communications with clients as compared to 87 percent of men, and only 48 percent of female-managed firms had their own website compared to 60 percent of male-managed firms (figure 4)<sup>8</sup>. The disadvantaged position of female-managed firms in the use of technology as measured by the firm having its own website is confirmed across size and sectors. When looking at the use of email to communicate with clients, female-managed firms do as well as male-managed firms only among manufacturing firms and large firms.



Source: Enterprise Surveys (2008-2009) and Financial Crisis Surveys (2009)

Note: "FCS" is the average for the countries with data from the Financial Crisis Surveys; "ECA" is the average for the countries in the Europe and Central Asia with ES data in 2008-2009; "All countries" is the average for all countries with ES data between 2006 and 2009.

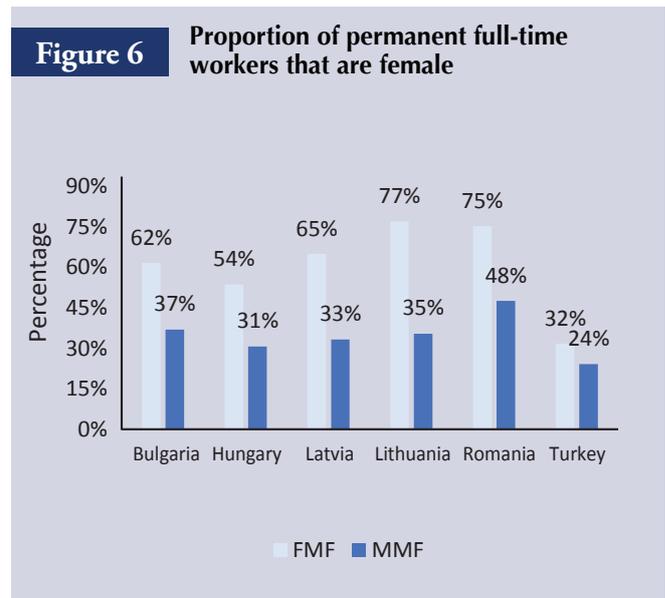
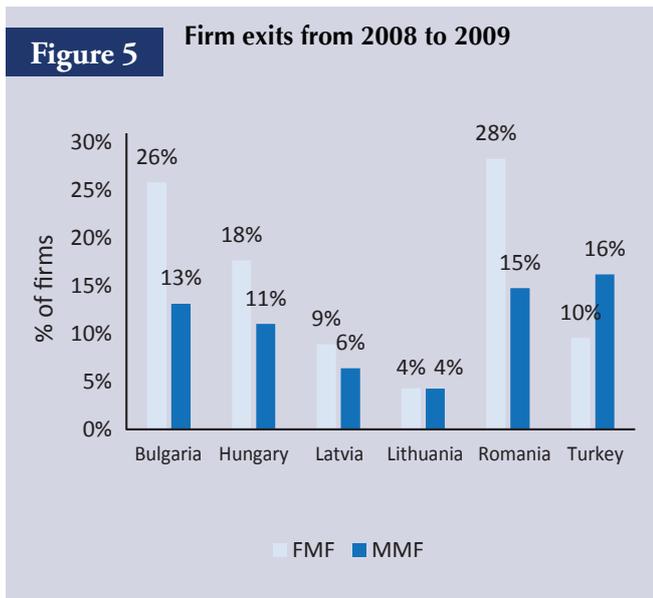
## Are female-managed firms more likely to exit business than male-managed firms?

Having the pre-crisis situation in mind, the first issue to consider is the gender dimension of exit patterns. The available data allow us to determine whether the firms in the full original sample of the ES were still in existence or if they had become inactive at the time of the first wave of follow-up data collection. The sample available for this analysis includes 2,499 observations in the six countries, of which 2,493 firms have information on the gender of a top manager. A top manager is female for 405 firms and male for 2,088 firms.

Using this information, firm exit rates from 2008 to 2009 are computed. In this note the definition of exit consists of the sum of three types of firms: a) firms that discontinued business or that are inactive from information obtained during the screening process; b) firms that during the survey indicated that they have filed for insolvency or bankruptcy; and c) firms that were impossible to locate. Since all the firms contacted for the FCS had been interviewed not long before the baseline in

2008, we can assume that unattainable firms went out of business.<sup>9</sup>

As Figure 5 shows, female-managed firms have a similar or higher exit rate than male counterparts in all countries, except for Turkey.<sup>10</sup> As shown in previous studies (Agarwal, 1996; Audretsch, 1995; Boeri and Bellman, 1995; Ericson and Pakes, 1995; Littunen, 2000, Aga and Francis, 2017), firm exit can be driven by several firm characteristics, including sector, years in operation, size of the firm, years of experience of the top manager and labor productivity. In other words, one may think that a higher percentage of female-managed firms exit the market because they are in more vulnerable sectors, or because they are smaller, or because female managers are less experienced. To account for these factors, we have estimated the probability of exit (using Probit models) that incrementally add these possible explanatory variables. The estimations allow us to verify if female-managed firms are still more likely to exit the market than male-managed firms, after accounting for these factors and to measure how likely they are to do so. We also consider



Source: Enterprise Surveys (2008-2009) and Financial Crisis Surveys (2009)

access to finance and the use of technology, proxied by having a bank loan or line of credit and by having its own website, respectively, as alternative explanations of exit. Results are confirmed with female-managed firms being around 7 percentage points more likely to exit the market than male-managed firms in all specifications of the model.<sup>11</sup>

What still needs to be explored is the reason for the patterns identified. More research may be needed to determine if the lower productivity of female-managed firms among large firms may be a factor. Unfortunately, with the available data it's hard to give an answer to this question given the very small sample of large firms among the exiting firms.

The disproportionate exits of female-managed firms from the market because of the financial crisis is bad news not only because the reduction of the already few female-managed firms (only 20 percent of all firms at baseline) worsens an already unequal situation; it is bad news also because it negatively affects female employment, given that female-managed firms hire more women than male-managed firms. On average, the proportion of permanent full-time employees that are women is higher in firms with female top managers than in firms with male top managers across countries (figure 6).<sup>12</sup> The fact that female-managed firms are more likely to exit the market at the time of the crisis, therefore, implies that employment opportunities for women are also lost disproportionately.

### Are firms with female top managers affected by the crisis as firms with male top managers?

The second issue to consider is the effect of the crisis on firms that remain in business. Three main aspects are considered: main effect reported by firms, effect on financing, and the effect on sales.<sup>13</sup>

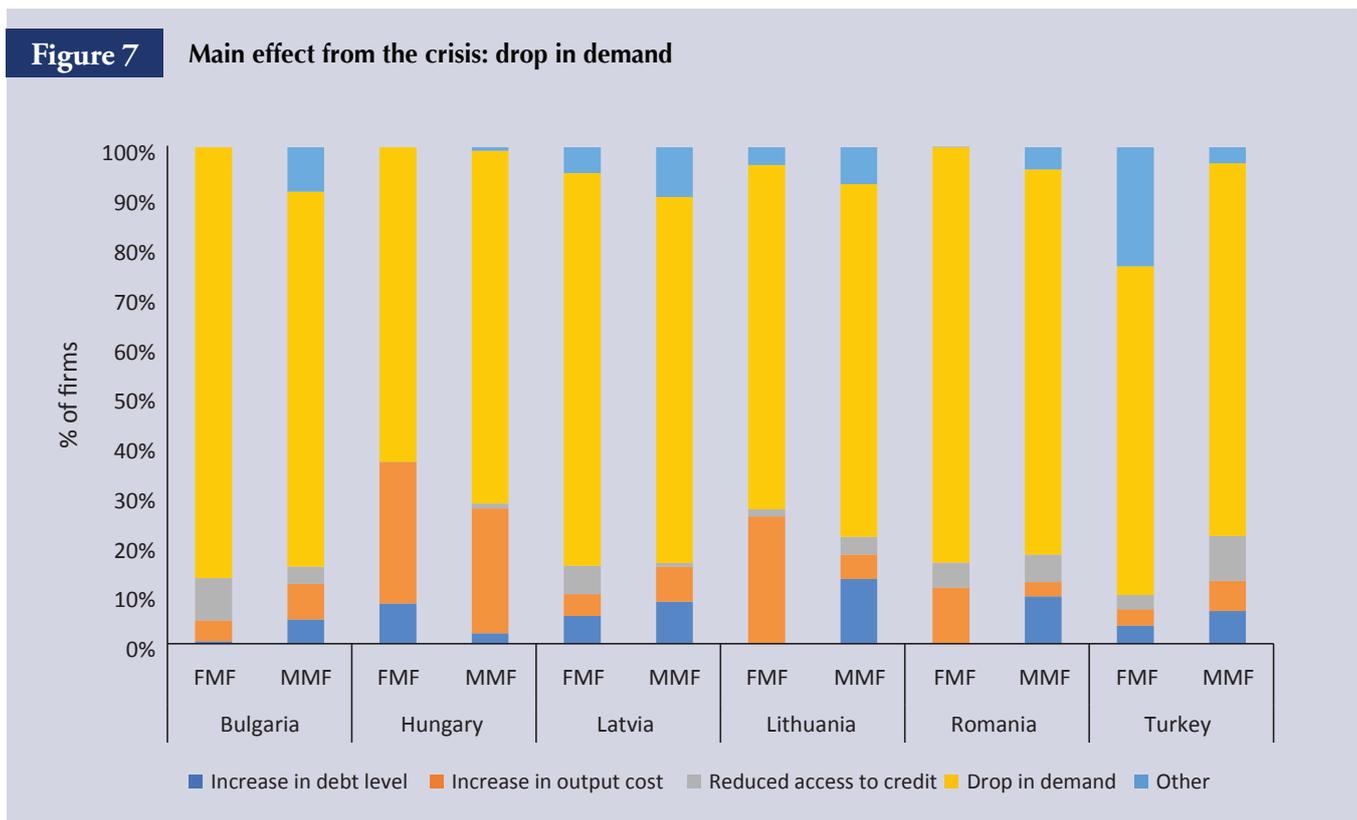
### Main effect of the financial crisis

During the first wave of the FCS, respondents were asked to indicate the main effect of the financial crisis out of a list of several options. Around 70 percent of both female and male-managed firms in each of the countries covered in the survey chose "drop in demand for its product and services" as the dominant effect of the crisis (figure 7). For female-managed firms, the percentage of firms that indicated "drop in demand" as the main effect varies from 66 percent in Turkey to 87 percent in Bulgaria. For the male-managed firms, percentages range from 71 percent in Hungary to 78 percent in Romania. When looking at the other options, there is no remarkable difference between female-managed and male-managed firms' answers with the only exception of the option concerning "increase in the debt levels". In all countries, except for Hungary, female-managed firms are less likely than male-managed firms to report "increase in debt level" as the main effect of the financial crisis. It is hard to explain the reasons behind this difference. On one hand, this may be the result of lower access to finance, while on the other hand it may be that female-managed firms may not need additional funds.<sup>14</sup> Some hints may be found by looking at indicators of the effect on firms' financing discussed below.

### Effects on firm's financing

During economic downturns, firms are more likely to become overdue in their obligations with financial institutions and to be forced to restructure their liabilities or even file for bankruptcy. The FCS survey measures the percentage of firms overdue on obligations with any financial institution in the 12 months prior to the interview. In all countries, except for Bulgaria and

**Figure 7** Main effect from the crisis: drop in demand



Source: Enterprise Surveys (2008-2009) and Financial Crisis Surveys (2009)

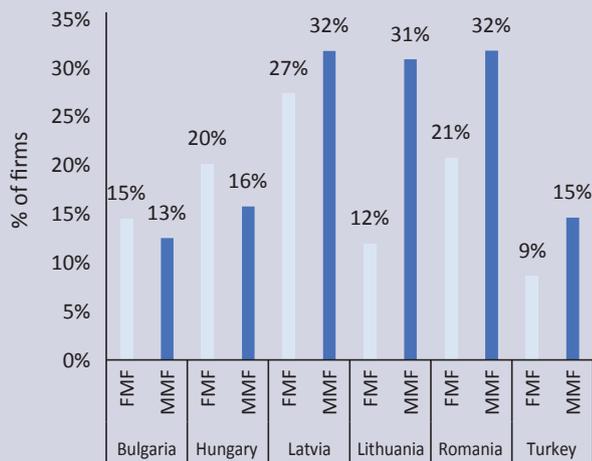
Hungary, female-managed firms are less likely to be overdue in obligations than male-managed firms in the short run as measured in the first wave of data collection (figure 8). When firms are overdue in their payments, or they want to prevent falling into arrears, they may attempt to restructure their liabilities. Firms may restructure their liabilities also to take advantage of better conditions in the financial market. The FCS included a measure of the percentages of firms that restructured outstanding liabilities in the previous 12 months. In all countries, except for Lithuania and Romania, in the short run (wave 1), more female-managed firms have restructured their financial liabilities compared to male-managed firms (figure 9).

To summarize, the data show that female-managed firms are less likely to experience an increase in debt due to the financial crisis and less likely to be overdue in financial obligations; however, a higher percentage of female-managed firms restructured their liabilities as compared to male-managed firms. The combination of the three indicators seems to suggest that female-managed firms may have restructured their liabilities to take advantage of better conditions in the markets (e.g. lower interest rate) rather than as a reaction to a difficult financial situation. Unfortunately, with the available data, it is impossible to verify if this was the case. We find some indication of the better market conditions from the analysis of the long-term data (wave 3) where we find no evidence of a difference in the financial distress indicators by female and male-managed firms.

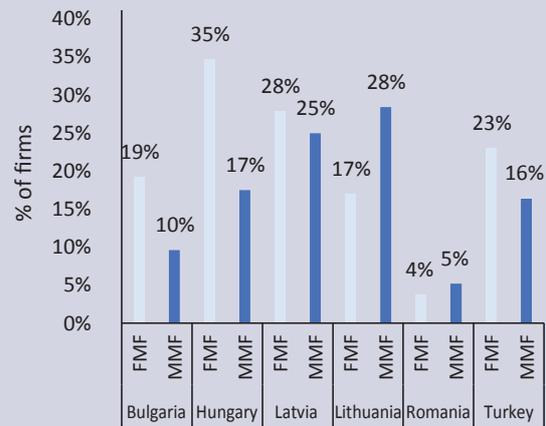
#### Effect on sales

In the first wave of the FCS survey, firms were asked if their sales increased or decreased from June 2008 to June 2009 and by what percentage. The percentage change in sales discussed in this section is the net effect computed using this question. As expected, in all countries both female and male-managed firms experienced a decrease in their sales (figure 10). However, in Bulgaria, Lithuania, Romania, and Turkey, the net percentage decrease in sales is lower for female-managed firms than male-managed firms. The reduction is very similar in Latvia and lower for male-managed firms only in Hungary. In the longer-term (wave 3), however, female-managed firms experienced a higher decrease in sales than male-managed firms across all countries (figure 11).<sup>15</sup> Also in this case, as for the exit analysis, the results were tested by estimating the probability of exit (using Probit regression analysis) accounting for firms' characteristics as potential explanatory variables of these differences. As in the previous section we use sector, years in operation, size of the firms, years of experience of the top manager and labor productivity as explanatory variables. The results confirm that in the short-term (wave 1), female-managed firms experienced a lower decrease in sales than the male-managed firms by about seven percentage points. These results are consistent across the subsequent addition of explanatory variables. Moreover, similar regression analyses with wave 3 data indicate that in the long run, female-managed firms experienced a higher decrease in net sales than the male-managed firms by around 13 percentage points.<sup>16</sup>

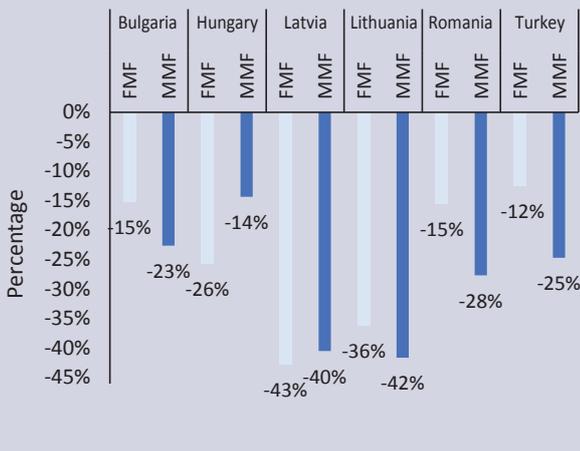
**Figure 8** Firms overdue in obligations last year (wave 1)



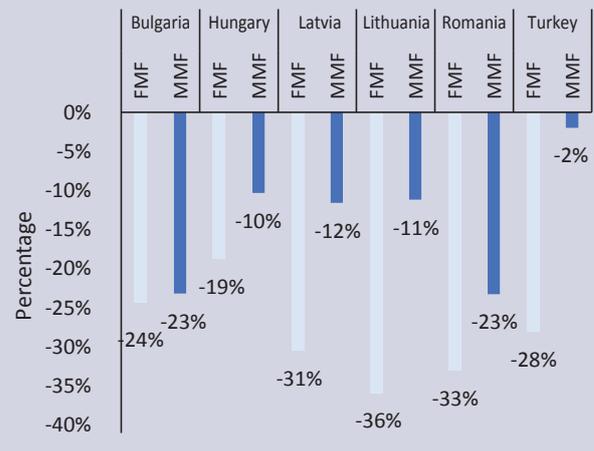
**Figure 9** Firms that restructured liabilities last year (wave 1)



**Figure 10** Net % change in sales in previous month compared to same month last year (wave 1)



**Figure 11** Net % change in sales in previous month compared to same month last year (wave 3)



Source: Enterprise Surveys (2008-2009) and Financial Crisis Surveys (2009)

## Conclusions

This note summarizes the results of an analysis using data collected during the 2008 financial crisis to examine if female-managed firms suffered more than male-managed firms. The findings are very interesting: firms managed by women are more likely to exit the market at the onset of the crisis; however, when able to stay in business, they endure the crisis as well as male-managed firms in the short term, with a deterioration in the relative conditions in the longer term.

It is difficult to identify the reasons behind these patterns. Just before the crisis, female-managed firms, which accounted for 20 percent of all firms, showed less access to finance and used less technology than their male peers. However, the analysis that takes all these factors into consideration still shows a higher probability of exit for female-managed firms. They were also slightly less productive than male-managed firms (largely driven by large firms), which may partially explain the higher exit rates. When staying in business, female-managed firms

don't seem to suffer from a lack of access to finance more than male-managed firms neither in the short term nor in the longer term. What deteriorated disproportionately more for female-managed firms were sales, maybe reflecting a more limited ability to adapt their business to the crisis. The role of access to technology and ability to adapt through innovation and changes in the business model are interesting patterns to explore further in future analyses as they may be key elements to focus when designing measures to support female entrepreneurship.

The findings from this note not only fill an evident gap in the literature but also provide evidence that may be useful to understand the potential challenges that women in business may be facing at the time of writing due to the effects of the COVID-19 crisis. As soon as more data on the effect of the COVID-19 pandemic are available for a large enough number of countries, the analysis will be replicated to verify if findings hold in a different type of crisis. For those interested, the data for the financial crisis and the COVID-19 crisis are available via <https://www.enterprisesurveys.org/en/full-survey>.

## Notes

- 1 The note has been committed and funded by the We-Fi Initiative.
- 2 The literature on firms exist focuses on mainly on factors such as productivity and age, with higher productive firms (Olley and Pakes 1996; Fariñas and Ruano 2005; Aga and Francis, 2017) and older firms (Jovanovic 1982; Pakes and Ericson 1998) being at a lower risk of exiting the market.
- 3 In all cases, participation in the financial crisis survey was voluntary for all sectors included in the original sample, except for Turkey where only the original manufacturing sub-sample was targeted.
- 4 As robustness check the analysis have been replicated for firms with female participation in ownership and results hold. Results are available upon request.
- 5 The difference is statistically significant at 5% level.
- 6 The difference is statistically significant at 5% level.
- 7 Female-managed firms were slightly more likely to have a bank loan or line of credit and less likely of not needing a loan than male-managed firms among manufacturing firms; these differences, though, are not statistically significant.
- 8 The difference is statistically significant at 1% level.
- 9 In total, 284 firms are defined as exiting firms of which 224 are male-managed and 60 are female-managed firms. Exit rate is the percentage of male and female-managed firms that exit the market as percentage of total male and female-managed firms.
- 10 As mentioned earlier, Turkey's sample is composed mostly of manufacturing which tends to be a male dominant sector and that can be part of the reasons why it exhibits a different pattern.
- 11 Results are significant at 5% and 10% depending on the specification. The positive sign is retained but we lose significance in the specification that controls for productivity. Due to missing information in the variables needed to compute productivity, in this specification we lose as many as 53 exiters (firms that exit the market) and more than 400 observations compared to the preceding specification. Regression results are available upon request.
- 12 These difference holds for female and male-managed firms in manufacturing, retail, and other services and for small, medium and large firms.
- 13 The sample for this section of the analysis is comprised of a total of 1,682 observations in wave 1 and 1,392 firms in wave 3. The sample distribution in wave 1 of FCS by female and male managed firms (total) are: 32 and 118 (150) firms in Bulgaria, 17 and 170 (187) firms in Hungary, 80 and 146 (226) firms in Latvia, 38 and 201 (239) firms in Lithuania, 61 and 306 (367) firms in Romania, and 46 and 467 (513) firms in Turkey, respectively. The sample distribution in wave 3 of FCS by female and male managed firms (total) are: 31 and 121 (152) firms in Bulgaria, 17 and 134 (151) firms in Hungary, 75 and 131 (206) firms in Latvia, 35 and 182 (217) firms in Lithuania, 52 and 250 (302) firms in Romania, and 40 and 324 (364) firms in Turkey, respectively.
- 14 The sensitivity of the responses on the main effect of the financial crisis in increasing the debt levels for female and male-managed firms was also tested by estimating probit regressions controlling for relevant characteristics of firms (sector, size, age of firms, years of experience of the top manager, and labor productivity). The results hold.
- 15 Results were tested by using t-tests that show differences in Latvia, Lithuania, and Turkey are statistically significant with the net percentages decrease in sales being higher for female-managed firms by 18.9, 24.8, and 26.1 percentage points than those of male-managed firms, respectively.

- 16 Even though adding labor productivity affects the significance of the effect of the financial crisis on net change in sales by female and male-managed firms, the coefficient is consistently negative, indicating that female-managed firms experienced a higher decline in sales in the long-term. Regression results are available upon request.

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