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ABSTRACT

I examine whether family hardship experienced by owners of micro and small firms affects the firms' growth. Based on a representative sample of owners of firms in Indonesia, and using deaths of owners' family members as a measure of hardship, I estimate the effects of family hardship on firms' total assets. I find that family hardship leads to about 30 percent smaller assets on average. Moreover, the magnitude of the effects is larger the smaller the firms are. These findings indicate that growth of micro and small firms is severely constrained by the availability of resources such as internally generated finance.

Keywords: micro and small firms, growth of assets, family hardship, Asia, Indonesia

JEL classification: G32, L26

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I. INTRODUCTION

What happens to growth of micro and small firms if owners of the firms experience family hardship? Are micro and small firms resilient to financial shocks suffered by owners' households, or is the firms' growth severely constrained by access to resources such as the availability of internally generated finance? How large are the effects of family hardship on the firms' total assets?

The answers to these questions are important to understand how micro and small firms grow.¹ Because micro and small firms typically account for most employment in developing countries, and they take a sizeable part of capital stock, employment and innovation in developed countries, these answers are also important in developing policies to reduce unemployment, spur innovation, and promote economic growth.²

In this paper, I examine whether micro and small firms in Indonesia are affected by family hardship experienced by owners of the firms.³ I focus on firms owned by a representative sample of the Indonesian population. Because these firms are very small—the number of workers is two or three on average—their financial positions are intertwined with the financial conditions of the households of the owners. If owners experience family hardship, the financial positions of the firms may deteriorate as well. The depletion of the firms' capital, if the firms are constrained by the availability of

¹ See, for example, Acs and Audretsch (1990) or Brock and Evans (1989) for a review of the literature on the growth of small firms. See also Nichter and Goldmark (2009) for an analysis of growth of small firms in developing countries.

² In Indonesia in 2006, for example, virtually all registered firms are small and medium enterprises whose number of workers is less than 100. Even though small firms take up about 50 percent of Indonesia's GDP, they employ more than 90 percent of the labor force (Tambunan, 2008). For a description of the importance of small firms in the U.S., see, for example, Acs and Audretsch (1988).

³ See, for example, Thee (2006) for a discussion on the development of private sectors in Indonesia. See also Tambunan (2008).

resources, would slow the firms' growth, and, hence, would lead to smaller firms' total assets.

I exploit, what I shall argue, after controlling for owners' household characteristics, a largely exogenous family hardship. I consider an owner of a firm experiences family hardship if at least one of his/her members of household had passed away in the previous few years. Then, I compare the values of total assets of firms owned by bereaved households and those of non-bereaved households. A negative difference implies that firms owned by bereaved households grow more slowly than those owned by non-bereaved households do: Family hardship adversely affects the total assets of micro and small firms, which suggests that growth of these firms is constrained by the availability of resources.

Formally, I estimate the effects of family hardship on micro and small firms' total assets by regressing the logarithm of the values of firms' total assets on an indicator of family hardship (that is, whether an owner has at least one of his/her members of household passed away in the previous few years) and a vector of firm characteristics as well as a vector of owner characteristics. After controlling for owner characteristics such as the size of the owners' households, the average age of members, and the years of schooling of members of households, we can consider the assignments of whether owners experience deaths of family members are largely random. An ordinary least squares (OLS) estimation of the model would then produce an unbiased estimate of the effects of family hardship on firms' total assets.

The results show that family hardship experienced by owners leads to smaller firms' total assets. The magnitude of the adverse effects is large, about 30 percent on average. Normally occurring shocks like having deaths in the family put major strains not only on the financial positions of owners' households, but also on the financial health

of micro and small firms. Moreover, there is also evidence that the smaller the firms are in terms of the number of workers employed, the larger the adverse effects will be.

I do a number of extensions and robustness checks. I find that family hardship affects firms' investment in non-equipment assets such as land, building and vehicles, but it does not seem to affect firms' investment in equipment assets. Moreover, there is no evidence that family hardship affects firms' asset purchases and asset sales as well as firms' revenue and expenses. These results indicate that family hardship adversely affects firms' accumulation of capital, in particular firms' stock of non-equipment assets, but it does not seem to affect the firms' current business operation.

I also redo the analysis using sub-samples of firms that exclude extremely small firms in terms of assets, or some of the larger firms in terms of the number of workers. Overall, the results are quite robust. Then, I estimate the effects of family hardship on total assets using other definitions of family hardship. Having sick members of households or experiencing crop losses does not seem to adversely affect firms' total assets, but the effects of deaths of family members in most specifications remain significant statistically and large economically.

This evidence suggests that growth of micro and small firms is severely constrained by limited access to resources. One of the most important of these resources is perhaps access to external finance.⁴ Theoretically, micro and small firms are constrained by internal finance because of asymmetric information problems. Small firms may not have collateral that banks require to get loans (Berger and Udell, 1990); some of the owners may not even know how to get loans from banks to finance their

⁴ The theory that the growth of small firms is constrained by internal finance goes back to Butters and Lintner (1945) who find that most small firms finance their growth almost exclusively by internal finance. See Schiantarelli (1995) and Hubbard (1998) for reviews of this line of literature. See also Hutchinson and Xavier (2006) and Becchetti and Trovato (2002) for discussions on the importance of external finance for SMEs, and Stam (2010) for the determinants of firms' growth.

firms' investment. Very small firms may not be able to secure loans because their profits are highly volatile (Stiglitz, 1985). Small firms also find that equity financing is more expensive than debt financing (Lee, Ritter and Zhao, 1996), which is true for all firms in the sample I examine in this paper. These firms, whose number of workers is only two or three on average, will never qualify to issue equity in stock exchanges.⁵

Empirically, the literature demonstrates that the availability of internally generated finance or access to external finance do constrain growth of small firms. Carpenter and Petersen (2002), for example, show that growth of small public firms in the U.S. is constrained by internal finance. Recently, Guariglia, Liu and Song (2011), examining the growth of private firms in China, find the same results. Fajnzylber, Maloney, and Montes-Rojas (2009) find that access to credits increases survival likelihood of micro-firms, while Guariglia (2008), analyzing the effects of both internal and external financial constraints faced by firms in U.K., shows that non-public young and small firms may be significantly constrained by access to external finance.⁶

This paper contributes to this line of literature in at least three respects. One, using an arguably clean identification method, I provide some evidence that growth of micro and small firms is severely affected by family hardship experienced by owners, which indicates that growth of these firms is constrained by limited access to resources such as the availability of internally generated finance. Two, I focus on micro and small firms, which complements papers in the literature on internal finance and growth of

⁵ See also Myers and Majluf (1984). They show that firms may experience lemon problems when they issue equity. Micro and small firms may face credit rationing too, as shown by Stiglitz and Weiss (1981).

⁶ See also Holtz-Eakin, Joulfaian, and Rosen (1994), Tsoukalas (2006), and Hartarska and Nadolnyak (2008). Holtz-Eakin, Joulfaian, and Rosen (1994) show entrepreneurs' successes and failures depend on the severity of liquidity constraints. Tsoukalas (2006) examines inventory investment of small firms, and finds that this form of investment is constrained by internal finance. Hartarska and Nadolnyak (2008) show that access to microfinance alleviates micro firms' financing constraint.

small and medium enterprises that typically analyze larger firms. The results in this paper may then apply to firms in other developing countries whose level of development is like Indonesia's and whose economies are dominated by micro firms. Three, I show that the magnitude of the effects is large economically.

It is obvious that, theoretically, micro and small firms are constrained by the availability of internally generated finance. But, empirically it is not clear how severe the constraints are. It is not obvious either whether naturally-occurring shocks like deaths of family members affect growth of micro and small firms; and, if they do affect growth of firms' assets, how large the effects are. This paper shows that deaths of family members adversely affect the growth of micro and small firms, and the adverse effects are large economically. Family hardship may lead to about 30 percent smaller total assets.

This paper proceeds as follows. Section II explains the methodology. Section III describes the data. Section IV discusses the results and robustness checks, and Section V concludes.

II. METHODOLOGY

I estimate the effects of family hardship experienced by owners' of micro and small firms on the values of the firms' total assets.

The method of identification relies on exogenous variations of family hardship experienced by owners. Some owners have family members who passed away in the previous few years, while some other owners do not. This family hardship puts some strains on the financial positions of owners' households as well as those of the firms they own. Bereaved households, low-income households in particular, who own micro and small firms may have to reallocate cash to, for example, finance the health care of family

members leading to the deaths as well as to pay for the funeral expenses—money that could have been used to buy raw materials and new equipment. The firms could have borrowed money to finance the firms’ expansion, but they may have limited access to external finance.⁷ As a result, firms owned by bereaved households grow more slowly compared to firms owned by non-bereaved households, and, hence, they accumulate smaller assets. Therefore, negative differences in the values of total assets of firms owned by bereaved- and non-bereaved households imply that family hardship leads to slower growth.

To examine the effects of family hardship on the values of firms’ total assets, I estimate the following model:

$$y_i = \alpha + \beta D_i + \sum_j \gamma_j Firm_{ij} + \sum_k \delta_k Owner_{ik} + \varepsilon_i \quad (1)$$

where y_i is the logarithm of the values of total assets of micro and small firm i ; D_i is a family hardship dummy, an indicator of whether the owner of firm i has family members who passed away in the past few years; $Firm$ is a vector of firm characteristics; $Owner$ is a vector of owner characteristics; and ε is the error term.

I introduce owner characteristics to ensure that whether an owner of a firm experiences family hardship is as random as possible. Larger- and older households, for example, are more likely to have deaths in the family. Richer- and more educated households have better access to health care, and, hence, are less likely to experience financial problems because of deaths of family members. Therefore, to make sure that the assignments of family hardship are as random as possible, I control for household size of owners, the average year of schooling of head and spouse, the average age of head and spouse, the number of children who are in school, the number of mature

⁷ Bereaved households are also likely to spend other resources, such as savings and labor, to care for the sick members of the households.

children, a set of ethnical group dummies, and a set of religion dummies. (See Table A in the Appendix for the descriptions of these variables and those of firm characteristics.)

I introduce firm characteristics to control for possible differences between firms whose owners are bereaved households and those whose owners are non-bereaved households. Larger- and older firms, for example, may be more able to withstand family hardships experienced by owners. I also include these firm characteristics to increase the precision of the estimates of β , the coefficient of family hardship. The firm characteristics are sole ownership dummy, shares held by householders, managed by household heads/spouses dummy, non-householder owners dummies, householder owner dummies, operating outside home dummies, business field dummies, year started the firm dummies, location of firm dummies at district level, and urban dummy.⁸

After controlling for these firm- and owner characteristics, I argue that the assignment of family hardship can be considered quite random. Therefore, to examine the effects of family hardship on the values of firms' total assets, I can estimate regression (1) using OLS method. To address potential biases in the estimation of standard errors, I estimate Huber/White heteroskedastic robust standard errors. I also allow the errors to be clustered by locations of the firms at district level to allow unrestricted correlation of residuals among micro and small firms in the same district.⁹

I expect the coefficient of family hardship, β , to be negative. After controlling for firm- and owner characteristics, family hardship leads to slower asset growth and, hence, smaller values of total assets. These adverse effects of family hardship on firms' total assets show that the growth micro and small firms is constrained by limited access to resources such as the availability of internally generated finance.

⁸ Each of the provinces in Indonesia is divided into a dozen or so districts.

⁹ I also estimate the standard errors clustered by owners. The standard errors are slightly smaller, but overall they are not different from those clustered by locations.

There are some concerns that Equation (1) suffers from omitted variable bias problems. Two of the most obvious omitted variables are entrepreneurship skills or work ethics of owners, and life expectancy of household members. It is likely that work ethics are positively correlated with the dependent variable, firms' total assets: Hard-working owners are likely to have fast-growing firms. But, it is unclear whether work ethics are negatively correlated with family hardship and other independent variables. On the other hand, life expectancy possibly has positive correlation with firms' total assets, and it is likely to be negatively correlated with family hardship.

Therefore, it is possible that an OLS estimate of the effects of family hardship overstates the true effects. However, to the extent that work ethics and life expectancy are religion-, and ethnical group specific, they have been controlled for in Equation (1).¹⁰ Moreover, if it turns out that the magnitude of the estimates is large, it is unlikely that the effects will be completely wiped out even if the omitted variable bias problems are perfectly addressed.

III. THE DATA

My empirical analysis is based on the Indonesia Family Life Survey (IFLS), an on-going longitudinal household survey in Indonesia conducted by RAND Corporation in collaboration with a number of research centers in Indonesia such as Lembaga Demografi of the University of Indonesia and Population Research Center of the University of Gadjah Mada. The data is a representative sample of about 83 percent of Indonesian population and includes over 30,000 individuals living in 13 of the 27

¹⁰ Chinese Indonesian and the people of Minangkabau, for example, are famous for their entrepreneurship skills. To the extent that entrepreneurship skills or business networks are ethnical group specific, they have been controlled for in Equation (1).

provinces in the country.¹¹

I focus on the third wave of the survey, IFLS-3, which was done in 2000.¹² IFLS-3 has a set of information about economic hardship experienced by members of households, which I can use to construct the key variable of interest, family hardship. I take the sample of micro and small firms from the Non-Farm Business module of IFLS-3, which includes about 5,400 businesses, almost all of them are micro firms, owned by about 4,400 households.¹³

I use the logarithm of the values of firms' total assets as the dependent variable. As a measure of total assets, I add up the values of all assets, which include, among others, land, building, vehicles, and equipment assets owned by each of the firms. To take into account differences of assets prices across Indonesia, I deflate the assets values with spatial Consumer Price Index, which makes the assets values equal to their values in the year 2000 rupiah in Jakarta. I also deflate other measures of assets, which I use as the dependent variable in some specifications, such as the values of equipment assets as well as those of asset purchases and asset sales with this price index.

I define the variable of interest—family hardship—equals one if an owner of a micro or small firm has family member(s) who passed away in the previous five years, that is in 1995-2000, and zero otherwise.¹⁴ As part of robustness checks, I also use alternative measures of family hardship such as indicators of whether households have sick family members or whether they experience natural disasters. In some

¹¹ The data is downloadable from <http://www.rand.org/labor/FLS/IFLS.html>.

¹² See Frankenberg and Thomas (2000) and Strauss et al. (2004) for extensive descriptions of this survey.

¹³ Ideally, I want to include firm- and owner fixed effects to control for time-invariant characteristics such as work ethics and entrepreneurship skills. It is not possible, however, to link firms in IFLS-3 with those in the previous waves because the lack of firm identifiers. It is not possible either to link firms in IFLS-3 with those in IFLS-4 because the questions on family hardship are not included in the IFLS-4 questionnaires.

¹⁴ I construct the key variable of interest, financial hardship, from questionnaires in Section GE (Economic Hardships) of Book II (Household Economy) of IFLS-3.

specifications, I define family hardship as an indicator of whether farmer households experience crop losses.

As control variables, I get the characteristics of the firms from the same module of the survey. These characteristics include, among others, ownership and management types of the firms and a set of indicators for business fields, the year of the firms' establishment, and locations of firms at district level.

I then link the owners of these firms with the information on their household characteristics in several household-related modules of the survey. These household characteristics include the size of households, age and education of head and spouse of households, and a set of indicators for ethnical group and religions. I describe the construction of these firm- and owner characteristics in Table A in the Appendix.¹⁵

There are 5,461 firms in the data. The firms are categorised into 16 business fields. They are agriculture, mining, utilities, construction, transportation and communication, finance, restaurants and food stalls, three groups of manufacturing industries, trading, and five groups of services. About 57 percent of firms in the sample are restaurants, food stalls and trading firms. Services and manufacturing account for about 19 and 13 percent of the firms, respectively; while agriculture, construction, and transportation account for 2-4 percent of the firms each.

About eighty percent of households in the sample of households that own non-farm businesses have a single firm. The other twenty percent households own more than one firm—mostly two or three firms. About nineteen percent of the firms are very small, they do not have valuable assets, or their assets data is unavailable. After excluding firms whose values of assets are not available or zero, I have about 4,400 micro and small firms in the sample.

¹⁵ The micro and small firms' characteristics are from Section NT (Non-Farm Business) of Book II; owners' characteristics are from Book III (Adult Individual Book).

I report the descriptive statistics of the key variables in Table 1. Almost all of these firms have sole ownership. If a micro or small firm is not owned by a single household, a household typically holds a large majority of its shares. About seven to eight in ten firms are managed by either households' heads or spouses. The firms are nine years old on average and have about two or three workers. The firms are therefore very small.

[INSERT TABLE 1 HERE]

In terms of these ownership- and management characteristics, firms whose owners experience family hardship and those whose owners do not are quite similar. If there are differences, they are as follows: (1) Firms owned by bereaved households are slightly smaller (the number of workers is 2.3 on average compared to 2.6 for the case of firms owned by non-bereaved households); and (2) A slightly smaller proportion of firms owned by bereaved households are managed by households' head or spouses (75 compared to 84 percent). Statistically, the differences between firms owned by bereaved- and non-bereaved households are not different from zero.

The assets of these two groups of firms are very different, however: Firms owned by bereaved households are Rp 9 million smaller in terms of assets. The values of total assets of firms owned by bereaved households are about Rp 6 million, while those owned by non-bereaved households are Rp 15 million. There are also marked differences in the values of equipment assets as well as those of asset purchases and asset sales: The values of equipment assets, asset purchases and asset sales of firms owned by bereaved households are about Rp 2.2 million, Rp 1.4 million, and Rp 0.7 million smaller,

respectively.¹⁶

These large differences indicate that family hardship does affect the firms' assets. Firms whose owners experience family hardship in the previous five years have 60 percent smaller total assets on average, 74 percent smaller equipment assets, 80 percent smaller asset purchases, and 97 percent smaller asset sales.

IV. RESULTS

I will now discuss the estimates of β , the coefficient of family hardship, in Equation (1). First, I look into the effects of family hardship on the values of firms' total assets. Then, I examine whether the effects of family hardship vary by firms' size and age. Then, I analyze what happens to equipment and non-equipment assets, to purchases and sales of assets, and to revenues and expenses if owners experience family hardship. Finally, I do some robustness checks to see whether the basic results are robust.

The Effects of Family Hardship on Total Assets

Table 2 presents the effects of family hardship—owners' experiences of deaths of family members in the previous five years—on firms' total assets. Each column provides a different specification, with or without firm- and owner characteristics, estimated using OLS estimator. Because owners were interviewed in the time span of several months in 2000, to control for inflation over time, all regressions include a set of months of interviews dummies.

Column 1 shows, in a regression without any control variables, family hardship is

¹⁶ Rp 1 million in 2000 is worth about US\$ 103. Indonesia's GDP per capita that year is about US\$ 780.

associated with 49 percent smaller assets. The correlation is economically large, and it is significant statistically. After controlling for a set of ownership- and management control variables, the estimate becomes smaller—43 percent (see column 2). Controlling for other firm characteristics—a set of indicators for business fields, the age of the firms, and their location at district level—the effects of family hardship on the value of firms' assets remains large and statistically significant: Having deaths of family members in the previous five years leads to 33 percent smaller total assets (see column 3).

[INSERT TABLE 2 HERE]

To ensure that the assignments of family hardship to firms are as random as possible, I then include a set of household characteristics of owners. After controlling for these owner characteristics, the result in column 4 of Table 2 shows that the effects of family hardship remain large: Experiencing at least one death of family members in the previous five years lowers firms' total assets by about 30 percent on average.

These large adverse effects of family hardship on firms' total assets show that, to grow, micro and small firms are constrained by limited access to resources, among others to the availability of internal finance. Owners may have to reallocate cash that could have been used to expand their businesses to, for example, finance health care- and funeral expenses of members of households who passed away. The households may also have to reallocate the labor of some family members employed by the firms to care for the diseased, or the firms may lose key human resources if members of households who passed away are managers. The fact that a typical micro or small firm cannot even cope with naturally occurring shocks like deaths of family members suggests that, to grow, micro and small firms rely heavily on the availability of internally generated resources.

Even though I partially control for entrepreneurship skills, work ethics and life

expectancy in Equation (1) to the extent that these variables are religion- or ethnical group specific, the OLS estimates the effects of family hardship may be overstated. However, given the large magnitude of the effects, about 30 percent, we can perhaps speculate that it is unlikely the effects of family hardship will be completely wiped out even if omitted variable bias problems can be completely addressed.

The Effects of Family Hardship by Firms' Size and Age

To explore how the effects of family hardship vary by firms' size and age, I estimate the following model:

$$y_i = \alpha + \beta D_i + \zeta_1 Size_i + \zeta_1 Size_i * D_i + \eta_1 Age_i + \eta_2 Age_i * D_i + \sum_j \gamma_j Firm_{ij} + \sum_k \delta_k Owner_{ik} + \varepsilon_i \quad (2)$$

where $Size_i$ is the size of firm i , Age_i is the age of firm i , and $Size*D$ and $Age*D$ are the interaction terms between family hardship experienced by owners and firms' age or size.

Table 3 presents the results. Each column provides a different specification, with or without owner characteristics, estimated using OLS estimator.

[INSERT TABLE 3 HERE]

In Panel A, I introduce the firms' number of workers and an interaction term between family hardship and the number of workers as additional explanatory variables.¹⁷ The results in column (1) show that, controlling for firm characteristics, family hardship has large adverse effects on firms' total assets: Owners' experiences with deaths in the family in the previous five years reduce the values of total assets by almost 90 percent. Larger firms seem to cope better with family hardship, however, as indicated by the estimate of the interaction term: Having an additional worker reduces

¹⁷ I use the number of workers when the businesses were started as a measure of the size of firms rather than the number of workers in 2000 to avoid endogeneity problems.

the adverse effects of family hardship on total assets by about 34 percentage points.

I then control for both sets of firm and owner characteristics. The estimates in column (2) show that the effects family hardship on total assets are smaller though remain very large—70 percent. Having an additional worker now reduces the adverse effects of family hardship by 24 percentage points.

In Panel B, I introduce the age of firms and an interaction term between family hardship and firms' age as additional explanatory variables. Controlling for firm characteristics only, or both firm and owner characteristics, I find that family hardship reduces total assets by 40 percent on average. There seems to be no differences of adverse effects of family hardship on young and old firms, however, as indicated by the estimates of the interaction terms, which are economically small and statistically insignificant.

I then include the interactions between family hardship and both firms' number of workers and age. Overall, the estimates presented in Panel C show that the results are robust: (1) The adverse effects of family hardship are economically large and statistically significant; (2) the smaller the firms are as indicated by the number of workers employed, the larger the effects will be; and (3) there seems to be no differences of adverse effects of family hardship on young and old firms.

The Effects on Equipment Assets and Asset Purchases/Sales

Table 4 presents the effects of family hardship on equipment and non-equipment assets. It also shows the effects of family hardship on purchases and sales of assets as well as firms' expenses and revenues. Each cell provides an estimate of family hardship in a different specification, with or without owner characteristics, with the values of equipment assets, those of asset purchases or those of asset sales, and those of expenses

and revenues as the dependent variable, estimated using OLS estimator.¹⁸

[INSERT TABLE 4 HERE]

Panel A presents the effects of family hardship on equipment and non-equipment assets. The first row shows that experiencing deaths in the family does not seem to affect firms' equipment assets: The estimates are positive, but they are insignificant statistically with standard errors two to three times as large as the estimates. These results suggest that non-bereaved owners of firms do not seem to have more investment in equipment assets compared to non-bereaved owners do, so that the firms' equipment assets do not differ statistically.

There are large effects of family hardship on non-equipment assets, however, as shown in row (2): Family hardship reduces firms' non-equipment assets such as land, building and vehicles by more than 65 percent on average, though the estimates are significant statistically at 10 percent level of significance.

Panel B presents the effects of family hardship on purchases and sales of assets in the previous twelve months. Experiencing deaths of family members in the previous five years does not seem to affect firms' asset purchases in the previous twelve months. The estimates are small, and they are not statistically significant at all with standard errors more than six times as large as the estimates.

Family hardship seems to reduce assets sales by about 30 percent on average. The estimates are marginally significant statistically, however, though this insignificance of the estimates does not necessarily mean that family hardship does not affect owners' decisions to sell assets. There are very few firms, one in about 21, that have asset sales in the previous twelve months, which perhaps indicates that I do not have sufficiently large

¹⁸ Note that equipment and non-equipment assets are stock variables, while the others are flow variables for the period of previous twelve months.

power to reject the null hypothesis at the conventional level of significance.

Panel C presents the effects of family hardship on firms' revenue and expenses in the previous twelve months. The estimates are not significant statistically at all with standard errors two to seven times as large as the estimates.

These results, along with the basic results discussed in Section 4 (a) and the extensions in Section 4 (b), show that family hardship does affect firms' total assets. Family hardship in the previous five years does not seem to affect firms' investment in equipment assets, nor does it affect asset purchases and sales in the previous twelve months. There is no evidence that family hardship affects firms' revenue and expenses in the previous twelve months either. It does, however, suggest that firms owned by bereaved households reduce investment in non-equipment assets such as land, building, and vehicles, or increase their non-equipment investment by a smaller amount compared to non-bereaved households, which leads to slower growth of firms' total assets.

Taken as a whole, these results show that firms owned by bereaved households do investment in assets crucial to the firms' survival such as equipment assets much like firms owned by non-bereaved households do. However, they seem to do much smaller investment in less important assets such as non-equipment assets, or perhaps they are more likely to sell these more liquid assets when the owners are experiencing family hardship. Even though there are lasting effects of family hardship on stocks of assets, there seems to be no effects of family hardship on the firms operations in the past twelve months. As indicated by the estimates of the effects of family hardship on assets sales and purchases as well as on expenses and revenues, the firms in the previous twelve months seem to perform equally well regardless of whether the owners had experiences family hardship in the previous five years.

Robustness Checks

Tables 5 and 6 present some robustness checks. Each cell in Table 5 shows the effects of family hardship on total assets using different sub-samples of firms. Each cell in Panels A-B and each column in Panel C of Table 6 presents the estimates of the effects using alternative measures of family hardship.

[INSERT TABLE 5 HERE]

In Panel A of Table 5, I exclude extremely small firms in terms of total assets: I include only firms whose values of total assets exceed Rp 50,000 and Rp 500,000. Both regressions, with or without owner characteristics, show the results are quite robust. The effects are economically large: Family hardship using these sub-samples leads to about 25-30 percent smaller total assets. The estimates become marginally significant statistically if I exclude firms whose total assets are below Rp 500,000, however, which is likely to be caused by the decline in the number of observations.¹⁹

In Panel B of Table 5, I exclude some of the relatively larger firms in the sample: I include firms whose number of workers at least 20 or at least 10. The results are also quite robust: The adverse effects are about 30 percent—it is economically large and significant statistically.²⁰

Table 6 shows the effects of family hardship using alternative measures of family hardship. In Panel A, I use deaths of family members in the previous three years or previous one year as a measure family hardship, with- or without owner characteristics. Overall, the results are quite robust: Family hardship leads to 27-40 percent smaller

¹⁹ Restricting total assets to at least Rp 500,000 leaves me with about 3,700 micro and small firms in the sample.

²⁰ Excluding firms whose number of workers is more than five leads to statistically insignificant estimates of the effects of family hardship. These statistically insignificant results are likely due the decrease in the number of observations.

assets, though the estimate of family hardship in Row (2) that includes owner characteristics is marginally significant statistically. It is likely, however, that this marginally significant result is due to the small proportion of firms whose owners experience family hardship if we consider deaths of family members in the previous year only. It is also possible that deaths of family members in the earlier years may still have lasting effects on firms' assets so that firms owned by non-bereaved households in the specification presented in row (2) are not the right control group for the firms owned by bereaved households.

In Panel B, I use sickness of members of households, crop loss experienced by households that do farming, or natural disasters as a measure of family hardship. The results indicate that sickness does not seem to affect firms' total assets: The magnitude of the effects is small, and they are not significant statistically. Crop loss, on the other hand, has large adverse effect on total assets: Firms whose owners experience crop loss have 10-16 percent smaller total assets. The estimates are not significant statistically, however, though this statistical insignificance might be because the sample size becomes too small so that there is no sufficient power to reject the null hypothesis.²¹

[INSERT TABLE 6 HERE]

The effects of experiencing natural disaster such flood, fire or earthquake, on the other hand, are positive, though they are insignificant statistically. One possible explanation of these insignificant estimates of natural disaster is that only few owners experience this type of family hardship, which makes the power to reject the null hypothesis is too low.²² Second, households hit by natural disasters such as earthquakes

²¹ The result in column 2 of Panel B is from a regression using 1,325 firms.

²² Only 1.5 percent of micro and small firms in the sample whose owners experience natural disasters.

or floods may receive financial aids from the government. These aids to some extent offset the financial losses that they experience, which could have affected their firms' total assets.

In Panel C, I include all four measures of hardship—deaths, sickness in the family, crop loss, and natural disaster—as measures of family hardship in a regression. Sickness in the family and crop loss do not seem to affect firms' total assets, while natural disasters lead to bigger assets though the estimates are not significant statistically at conventional level. The estimates of deaths in the family, on the other hand, continue to be large economically and significant statistically.

Overall, the results in Table 6 are in line with the basic results: Major shocks like deaths of family members adversely affect total assets. Smaller shocks like sickness in the family do not seem to matter much, however.

V. CONCLUDING REMARKS

I have examined whether the growth of micro and small firms is affected by family hardship experienced by owners. Using deaths of owners' family members as exogenous shocks to owners' households and firms, I estimate the effects of family hardship on firms' total assets. Financial conditions of owners' households are closely intertwined with the financial health of micro and small firms. Financial shocks to households of owners are, therefore also shocks to the ability of firms to expand. I show that family hardship experienced by owners of micro and small firms leads to slower growth, and hence, smaller total assets.

This evidence suggests that the growth of micro and small firms is severely constrained by limited access to resources, among others internally generated finance,

such that deaths of owners' members of households put severe strain on the financial positions of owners' households and those of their firms.

These results underline the importance of helping micro and small firms to access external finance. If governments want to promote the growth of these firms, they need to help micro and small firms to weather even naturally occurring shocks like deaths of family members. This may mean that thriving micro-finance is a key determinant of the growth of firms in developing countries like Indonesia. The results also suggest that government welfare programs are crucial not only to help poor households coping with economic shocks, but also to promote highly growing real sectors in developing countries, which are typically dominated by micro and small firms.

One limitation of the paper is the lack of direct evidence on the adverse effects of limited access of micro and small firms to any particular resource. The measure of family hardship I use in this paper does not only measure the availability of, for example, internally generated finance. Deaths of family members may reduce the number of workers that firms employ. The deaths may also lower the productivity of workers and managers of the firms who are members of households, and this lower productivity in turn could lead to slower growth of the firms' total assets.

However, given the large magnitude of the effects of family hardship that I identify in this paper, and the plausibility of the exogenous shocks I exploit, we can perhaps conclude that the growth of micro and small firms is severely constrained by access to resources such as the availability of internally generated finance or access to external finance.²³

This finding is not surprising, but in this paper I show not only that, empirically,

²³ Deaths of family members provide exogenous shocks in a sense that, after controlling for firm- and owner characteristics, whether an owner experiences deaths of family members is arguably quite random.

there are adverse effects of naturally occurring shocks like deaths of family members on the growth of micro and small firms, but also that the adverse effects are long lasting and economically large. These findings suggest that, to develop private sectors, stimulate the growth of micro and small firms, reduce unemployment rate, and promote economic growth, governments may need to consider providing welfare programs for the poor and helping very small firms to access resources such as external finance.

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Key variables	Unit	Means		Difference
		Family hardship	No family hardship	
		(1)	(2)	(1) - (2)
Total assets	Rp million	6.15 (18.40)	15.10 (91.21)	-8.95
Equipment assets	Rp million	0.77 (2.92)	2.95 (53.30)	-2.19
Assets purchases	Rp million	0.36 (1.70)	1.81 (23.49)	-1.44
Assets sales	Rp million	0.02 (0.25)	0.72 (14.01)	-0.70
Sole ownership		0.96 (0.19)	0.97 (0.18)	-0.004
Shares held by households	Percent	97.68 (12.2)	97.92 (12)	-0.24
Managed by household heads/spouses		0.75 (0.44)	0.84 (0.37)	-0.09
Year started the business		1991 (10)	1991 (10)	-0.6
The number of workers		2.26 (4.97)	2.62 (8.95)	-0.37

Note: The numbers in parentheses are standard deviations. The number of observations of firms whose owners experience family hardship is about 289; no family hardship 4,083. The values of stock of assets are the values on the day of the interview; the values of assets purchases and sales are in the previous twelve months. These values are deflated by spatial Consumer Price Index.

Table 1: Summary statistics

Dependent variable: ln(Total Assets)				
	(1)	(2)	(3)	(4)
Family hardship	-0.49 (0.15)	-0.43 (0.16)	-0.33 (0.14)	-0.30 (0.13)
Firm characteristics				
<i>Ownership and management</i>		✓	✓	✓
<i>Business field, age, and location</i>			✓	✓
Owner characteristics				✓
Observations	4,372	4,361	4,290	4,283
R-squared	0.002	0.09	0.30	0.37

Note: Each column shows the estimate of family hardship, with or without firm- or owner characteristics. The numbers in parentheses are heteroskedastic-robust standard errors, clustered by locations of firms at district level. The details of firm- and owner characteristics are described in the Appendix. All regressions include a set of months of interview dummies.

Table 2: The effects of family hardship on total assets

Dependent variable: ln(Total Assets)		
	(1)	(2)
A. Interaction with the number of workers		
<i>Family hardship</i>	-0.89 (0.24)	-0.70 (0.25)
<i>Number of workers</i>	0.09 (0.04)	0.07 (0.03)
<i>Number of workers * Family hardship</i>	0.34 (0.10)	0.24 (0.12)
B. Interaction with the age of firms		
<i>Family hardship</i>	-0.40 (0.18)	-0.40 (0.17)
<i>Age of firms</i>	0.003 (0.005)	0.01 (0.005)
<i>Age of firms * Family hardship</i>	0.01 (0.01)	0.01 (0.01)
C. Interactions with the number of workers and age of firms		
<i>Family hardship</i>	-0.93 (0.26)	-0.76 (0.27)
<i>Number of workers</i>	0.09 (0.04)	0.07 (0.03)
<i>Number of workers * Family hardship</i>	0.34 (0.10)	0.24 (0.12)
<i>Age of firms</i>	-0.02 (0.01)	-0.02 (0.02)
<i>Age of firms * Family hardship</i>	0.004 (0.01)	0.01 (0.01)
Firm characteristics	✓	✓
Owner characteristics		✓

Note: Each column in each panel shows the estimate of family hardship and its interactions with the number of workers or the age of firms, with firm characteristics, and with or without owner characteristics. The numbers in parentheses are heteroskedastic-robust standard errors, clustered by locations of firms at district level. The details of firm- and owner characteristics are described in the Appendix. All regressions include a set of months of interview dummies. Regressions in Panels B and C do not include dummies for years the firms started business. The number of observations is about 4,300.

Table 3: The effects of family hardship by firms' size and age

Dependent variable: ln(Assets)			
		(1)	(2)
A. Equipment and non-equipment assets			
Equipment assets	(1)	0.14 (0.30)	0.17 (0.31)
Non-equipment assets	(2)	-0.68 (0.41)	-0.66 (0.40)
B. Assets purchases and sales			
Assets purchases	(3)	-0.01 (0.39)	0.09 (0.39)
Assets sales	(4)	-0.31 (0.18)	-0.28 (0.18)
C. Revenue and expenses			
Revenue	(5)	-0.04 (0.14)	-0.02 (0.14)
Expenses	(6)	-0.06 (0.18)	-0.09 (0.17)
Firm characteristics		✓	✓
Owner characteristics			✓

Note: Each cell shows the estimate of family hardship in a regression of a dependent variable indicated in the first column, with firm characteristics, and with or without owner characteristics. The numbers in parentheses are heteroskedastic-robust standard errors, clustered by locations of firms at district levels. The details of firm- and owner characteristics are described in the Appendix. All regressions include a set of months of interview dummies. The number of observations for regressions in Panels A and B is about 4,300; in Panel C about 2,500-3,000.

Table 4: The effects of family hardship on stocks of assets and flows of investment

Dependent variable: ln(Total Assets)			
		(1)	(2)
A. Exclude very small firms			
Exclude firms whose assets below Rp 50,000	(1)	-0.30 (0.14)	-0.27 (0.13)
Exclude firms whose assets below Rp 500,000	(2)	-0.30 (0.15)	-0.26 (0.14)
B. Exclude some of the relatively larger firms			
Exclude firms whose number of workers above 20	(3)	-0.33 (0.14)	-0.31 (0.12)
Exclude firms whose number of workers above 10	(4)	-0.31 (0.14)	-0.28 (0.13)
Firm characteristics		✓	✓
Owner characteristics			✓

Note: Each cell shows the estimate of family hardship, with firm characteristics, and with or without owner characteristics. The numbers in parentheses are heteroskedastic-robust standard errors, clustered by locations of firms at district levels. The details of firm- and owner characteristics are described in the Appendix. All regressions include a set of months of interview dummies. The number of observations is from 2,300 to 4,000.

Table 5: Using different sub-samples

Dependent variable: ln(Total Assets)			
		(1)	(2)
A. Using family hardship in the previous three years or one year			
<i>Family hardship in the previous three years</i>	(1)	-0.29 (0.15)	-0.27 (0.14)
<i>Family hardship in the previous one year</i>	(2)	-0.41 (0.18)	-0.30 (0.18)
B. Using other measures of family hardship			
<i>Sickness in the family</i>	(3)	-0.06 (0.12)	-0.02 (0.11)
<i>Crop loss</i>	(4)	-0.16 (0.19)	-0.10 (0.18)
<i>Natural disasters</i>	(5)	0.62 (0.29)	0.48 (0.26)
C. Using all four measures of family hardship			
<i>Deaths in the family</i>		-0.32 (0.14)	-0.30 (0.13)
<i>Sickness in the family</i>		-0.04 (0.12)	-0.005 (0.11)
<i>Crop loss</i>		-0.13 (0.16)	-0.09 (0.15)
<i>Natural disasters</i>		0.62 (0.29)	0.48 (0.26)
Firm characteristics		✓	✓
Owner characteristics			✓

Note: Each cell in Panels A-B shows the estimate of family hardship, with firm characteristics, and with or without owner characteristics. Each column in Panel C shows the estimates of all four measures of family hardship in a regression. The numbers in parentheses are heteroskedastic-robust standard errors, clustered by locations of firms at district level. The details of firm- and owner characteristics are described in the Appendix. All regressions include a set of months of interview dummies. The number of observations is about 4,300 except for Row (4) in Panel B (1,326), which includes farming households only.

Table 6: Using alternative definitions of family hardship

APPENDIX

	Variables	Notes
Key variable	Family hardship	1 if experience death in the family in the previous six years; 0 otherwise
Firm characteristics	<i>Ownership and management types</i>	
	Sole ownership dummy	1 if sole ownership; 0 otherwise
	Percentage of shares held by members of households	
	Managed by household heads/spouses dummy	1 if managed by heads/spouse; 0 otherwise
	Owners who are non-member of household dummies	A set of combination of owners dummies
	Owners who are members of household dummies	A set of combination of owners dummies
	Operating outside home dummies	Inside home, partially inside, outside
	<i>Business field, age, number of workers, and location</i>	
	Business field dummies	16 fields
	Year started business dummies	A set of year dummies
	Location (at district level) dummies	A set of district dummies
	Urban dummy	1 if urban; 0 otherwise
Owner characteristics	Household size (number of members)	
	Average year of schooling of head and spouse	
	Average age of head and spouse	
	Number of children who are in school	
	Number of mature children	
	Ethnical groups dummies	A set of ethnical groups dummies
	Religion dummies	A set of religion dummies

Table A: Description of variables