Family Hardship and the Growth of Micro and Small Firms in Indonesia

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FAMILY HARDSHIP AND THE GROWTH OF MICRO AND SMALL FIRMS IN INDONESIA

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I examine what happens to the total assets of micro and small firms in Indonesia when their owners experience hardship such as the death or sickness of family members, crop losses, or natural disasters. Using a representative sample of firm owners, I find that deaths of family members reduce the assets of such firms, that the adverse effects of these are long-lasting and economically large, and that the smaller the firms the greater the magnitude of these effects. There is no evidence, however, that the sickness of family members, crop losses, or natural disasters reduce firms' assets. These results suggest that only severe family hardship impedes the growth of micro and small firms.

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

JEL classification: D19, D21, I30, J46

INTRODUCTION

Micro and small firms account for most enterprises and employment in developing countries.[1] Nearly all firms in Indonesia in 2007, for example, were micro or small; they employed more than 92% of the labour force and generated about 38% of the country's gross domestic product (Sembiring 2008). Most micro and small firms are informal, use rudimentary technologies, and employ only one or two workers (often poor and unpaid family members whose subsistence livelihoods depend on their firm's profits), yet collectively they boost economic growth: micro and small firms in Indonesia contributed 40% of the country's 5.5% growth in 2006 (Tambunan 2008).[2]

Micro and small firms often lack access to external finance and depend on family workers, so they can be sensitive to changes in their owners' finances. Should owners experience family hardship, their firms may lose employed family workers and see their financial positions deteriorate. If the firms are constrained by the

availability of resources, a depletion of capital and a decline in the supply of family workers could constrain the firms' growth or even reduce their total assets.[3]

These problems raise questions about the effects of owners' family hardship on the growth of micro and small firms. How resilient are such firms? Is their growth severely constrained by limited access to resources like internal finance or a pool of family workers? Because micro and small firms generate employment and increase national output, the answers to these questions are important for policymakers seeking to reduce unemployment, spur innovation, or promote economic growth.

This article examines the effects of family hardship on the growth of micro and small firms in Indonesia. It provides evidence that micro and small firms grow more slowly when their owners experience family hardship, which indicates that the growth of such firms is constrained by limited access to resources. It also contributes to the literature on firms' growth and internal finance; by focusing on micro and small firms in a developing country, it complements analyses of large firms in developed countries.

LITERATURE REVIEW

Family hardship affects the growth of micro and small firms because they can be severely constrained by limited access to resources such as external finance.[4] Small firms may not have the collateral to secure a bank loan to finance their firm's investments (Berger and Udell 1990); some owners may not even know how to apply for such a loan. Micro firms also find it difficult to secure loans, because their profits are often highly volatile (Stiglitz 1985). Small firms also find that equity financing is more expensive than debt financing (Lee et al. 1996), which is true for all firms in the sample examined in this article.[5]

The literature shows that the availability of internal and external finance governs the growth of small firms. Carpenter and Petersen (2002), for example, show that the growth of small public firms in the United States is constrained by limited access to internal finance. Guariglia, Liu, and Song (2011), who examine the growth of private firms in China, find the same results. Fajnzylber, Maloney, and Montes-Rojas (2009) find that access to credit increases the likelihood of micro firms surviving. Guariglia (2008) analyses the effects of both internal and external financial constraints faced by firms in the United Kingdom, and shows that

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3. See, for example, Acs and Audretsch (1990) and 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 the growth of small firms in developing countries.

4. Micro and small firms are also often constrained by limited access to internal finance because of problems of asymmetric information. This theory goes back to Butters and Lintner (1945), who find that most small firms support 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 of the importance of external finance for small and medium enterprises.

5. See also Myers and Majluf (1984), who show that firms may experience 'lemon problems' (those of quality uncertainty due to asymmetric information) when they issue equity. Stiglitz and Weiss (1981) show that micro and small firms may also face credit rationing.

non-public young and small firms are constrained by limited access to external finance.[6]

Family hardship also affects firms' growth by shrinking the pool of family workers. For example, the family-embeddedness perspective of entrepreneurship proposed by Aldrich and Cliff (2003) argues that micro and small firms have to rely on kinship ties and cheap family workers because they are small and unattractive employers. Gómez-Mejia et al. (2007) suggest that family workers not only provide labour for the family firm but also generate social capital, or 'socio-emotional wealth' (SEW). SEW makes family workers identify themselves strongly with their firm and commit to its preservation and that of its SEW. Family hardship experienced by owners may reduce the pool of labour and therefore the source of SEW, which in turn may slow firms' growth.[7]

METHODOLOGY

The method of identification used in this article relies on exogenous variations of family hardship experienced by owners. Some owners in the representative sample (see the 'Data' section below) had family members who passed away or fell sick; other owners did not. Some farming households suffered crop losses; others were hit by natural disasters. These hardships drained household and firm resources. For example, bereaved households (low-income ones, in particular) that owned micro and small firms had to use their firms' cash or sell their firms' assets to finance the health care of sick family members and to pay funeral expenses—resources that they could have used to buy raw materials or new equipment.[8] These firms could have borrowed money to finance their operation or expansion, but they may have had limited access to external finance. This suggests that firms owned by bereaved households grow more slowly than firms owned by non-bereaved households. 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 among owners' firms.

I use the following regression equation to estimate the effects of family hardship on firms' total assets:

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

where y_i is the logarithm of the values of the total assets of micro or small firm i; D_i is a family hardship dummy, an indicator of whether the owner of firm i

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6. See also Holtz-Eakin, Joulfaian, and Rosen (1994), Tsoukalas (2006), and Hartarska and Nadolnyak (2008). Holtz-Eakin, Joulfaian, and Rosen (1994) show that entrepreneurs' successes and failures depend on the severity of liquidity constraints. Tsoukalas (2006) examines the 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 the financing constraints faced by micro firms.

7. See also Cruz, Justo, and De Castro (2012) on the empirical findings in this line of literature.

8. Bereaved households are also likely to use other resources, such as savings and labour, to care for the sick family members.

experienced hardship 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 the likelihood of a firm owner experiencing family hardship is as random as possible. Larger and older households, for example, are more likely to experience deaths or sickness in their family. Richer and more educated households have better access to health care and are hence less likely to experience financial problems because of the deaths of family members. Therefore, to make sure that the likelihood of a household experiencing family hardship is as random as possible, I control for the size of an owner's household, the average number of years of schooling completed by the household head and spouse, the average age of the head and spouse, the number of children who are in school, the number of mature children, a set of ethnic-group dummies, and a set of religion dummies (see appendix table A1 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 in bereaved households and those whose owners are not. Larger and older firms, for example, may be more able to withstand family hardships experienced by their owners. I also include firm characteristics to increase the precision of the estimates of β, the coefficient of *family hardship*. The firm characteristics include a sole-ownership dummy; whether shares are held by householders; and dummies for whether the firm is managed by the household head or spouse, whether its owners are householders or non-householders, whether the firm operates outside of the home, the business field in which the firm operates, the year that the firm started, its location (at the district level), and whether the firm is in an urban area.[9]

After controlling for these firm and owner characteristics, I argue that the likelihood of an owner experiencing family hardship is quite random. I therefore apply the ordinary least squares (OLS) estimator to equation (1) to examine the effects of family hardship on firms' total assets. To address potential biases in the estimation of standard errors, I estimate Huber–White heteroskedastic robust standard errors. I also cluster the errors by the locations of the firms at district level to allow the unrestricted correlation of residuals among micro and small firms in the same district.[10]

I expect the coefficient of family hardship, β, to be negative: family hardship leads to slower asset growth or smaller total assets. These adverse effects of family hardship on firms' assets show that the growth of micro and small firms is constrained by limited access to resources such as the availability of internal finance or a pool of family workers.

Equation (1) may suffer from bias problems due to omitted variables. The three most obvious omitted variables are the entrepreneurship skills of owners, their work ethic, and the life expectancy of their household's members. It is likely that

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9. I would preferably also control for firms' sources of finance and number of unpaid family workers, but past information on these variables is unavailable. *Current* information on such variables is available, but including them as control variables would introduce selection bias (Angrist and Pischke 2009, 64–68).

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

work ethic is positively correlated with the dependent variable, firms' assets: hard-working owners are more likely to have fast-growing firms. But it is unclear whether work ethic is negatively correlated with family hardship and other independent variables. Life expectancy may have a positive correlation with firms' assets and a negative correlation with family hardship.

It is therefore possible that OLS estimates of the effects of family hardship overstate the true effects. However, to the extent that entrepreneurship skills, work ethic, and life expectancy are specific to an owner's religion, ethnic group, and level of education, they have been controlled for in equation (1).[11] Moreover, if the magnitude of the estimates turns out to be large, it is unlikely that the effects will be zero, even if I solve the bias problems related to omitted variables.

DATA

I use data from the Indonesia Family Life Survey (IFLS), an ongoing longitudinal household survey in Indonesia conducted by the RAND Corporation in collaboration with a number of research centres, such as the Demographic Institute of the University of Indonesia and the Center for Population and Policy Studies of the University of Gadjah Mada. The data are a representative sample of about 83% of the Indonesian population and include more than 30,000 individuals.[12]

I focus on the third wave of the survey, IFLS3, which took place in 2000.[13] IFLS3 has a set of information about economic shocks experienced by household members, which I use to construct the key variable of interest in this article: family hardship. I take the sample of micro and small firms from the Non-farm Business module of IFLS3, which includes around 5,400 businesses owned by about 4,400 households, almost all of which are micro firms.[14] I define micro and small firms according to Law 20/2008 on Micro, Small and Medium Enterprises: a firm is micro if its net tangible assets (excluding its land and buildings) are less than Rp 50 million or if its total annual sales are less than Rp 300 million; it is small if its tangible assets are Rp 50–500 million or if its annual sales are Rp 300–2,500 million.

I use the logarithm of the values of firms' total assets (which include, among others, land, buildings, vehicles, and equipment) as the dependent variable. To take into account the differences in asset prices across Indonesia, I use the IFLS

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11. For example, Chinese Indonesians and the people of Minangkabau are well known for their entrepreneurial skills and business networks. To the extent that these skills and networks are specific to these ethnic groups, they have been controlled for in equation (1).

12. The data are available at http://www.rand.org/labor/FLS/IFLS.html.

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

14. I would like to include firm and owner fixed effects to control for time-invariant characteristics such as work ethic and entrepreneurial skills. It is not possible, however, to link firms in IFLS3 with those in the previous waves, because of the lack of firm identifiers. It is also not possible to link firms in IFLS3 with those in the fourth wave of the survey (IFLS4), because the IFLS4 questionnaires do not collect responses on family hardship.

spatial consumer price index to deflate their values, which brings them into line with their values in rupiah in the year 2000 in Jakarta.[15]

In the basic specifications, family hardship takes the value of one if an owner of a micro or small firm had at least one family member pass away in the previous five years (that is, during 1995–2000), and zero otherwise. In conducting robustness checks, I use other measures of family hardship (such as indicators of whether households had sick family members or experienced natural disasters during 1995–2000). In some specifications, I define family hardship as an indicator of whether farming households had suffered crop losses.[16]

I use as control variables the characteristics of the firms in the Non-farm Business modules of IFLS3. These characteristics include, among others, ownership and management types of the firms, a set of indicators for their business fields, the years in which the firms were established, and the locations of the firms at district level.[17]

I then link the owners of these firms with the information about their household characteristics in several household-related modules of IFLS3. These characteristics include the size of households, the age and education of the household head and spouse, and a set of indicators for ethnic groups and religions. I describe the construction of these firm and owner characteristics in appendix table A1.[18]

The data comprise 5,461 firms, which are categorised into 16 business categories: agriculture, mining, utilities, construction, transportation and communication, finance, restaurants and food stalls, trading, three groups of manufacturing industries, and five groups of services. About 57% of firms in the sample are restaurants, food stalls, or trading firms. Services and manufacturing account respectively for about 19% and 13% of the firms; agriculture, construction, and transportation each account for 2%–4%.

About 80% of the sample of households that own non-farm businesses own a single firm. The other 20% own mostly two or three firms. About 19% of firms in the sample are very small or lack valuable assets (or the data on their assets are unavailable). After excluding firms whose values of assets are zero or not available, the sample comprises about 4,400 micro and small firms.

Table 1 reports the descriptive statistics of the key variables; figures 1a and 1b show the size distribution of the firms. Almost all of the firms have sole ownership. If a micro or small firm is not owned by a single household, a household typically holds the majority of its shares. About seven to eight in ten firms are managed by either household heads or their spouses. The firms are nine years

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15. The value of the assets of firms was deflated with spatial consumer price indices from IFLS, which are calculated by province and distinguish between rural and urban areas (Witoelar 2009). Remaining differences in the regional purchasing power of the rupiah are largely captured by dummy variables for the location of firms by district and by urban or rural area.

16. I construct the key variable, financial hardship, from the questionnaires in section GE (Economic Hardships) of Book II (Household Economy) of IFLS3.

17. I use farm characteristics from the Farm Business module.

18. The micro and small firm characteristics are from section NT (Non-farm Business) of Book II; owner characteristics are from Book III (Adult Individual Book).

FIGURE 1a *Size Distribution of the Firms*
(total assets)

Density

Logarithm of the total assets
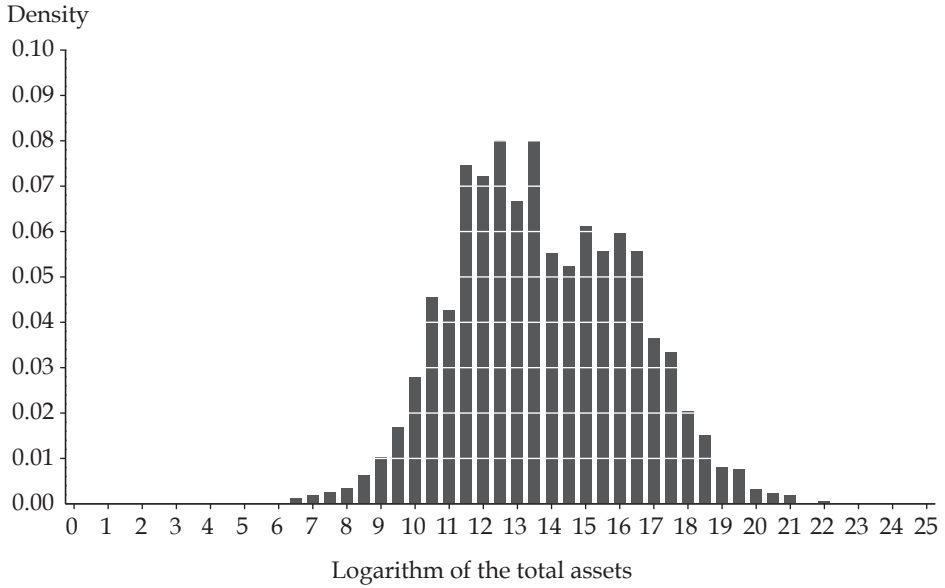
Source: Author's calculations based on data from the Indonesia Family Life Survey.

FIGURE 1b *Size Distribution of the Firms*
(number of workers)

Density

Logarithm of the number of workers
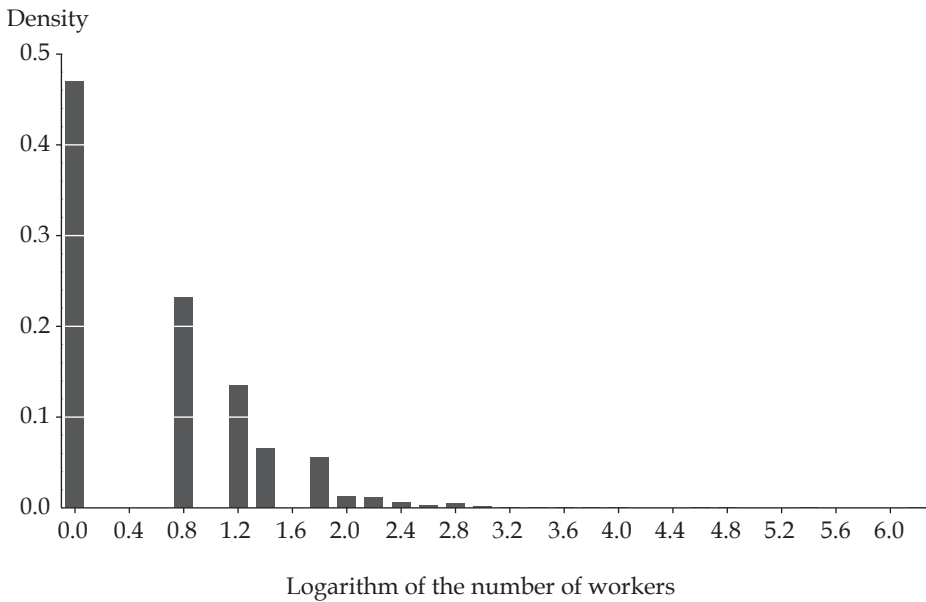
Source: Author's calculations based on data from the Indonesia Family Life Survey.

TABLE 1 *Summary Statistics*

Key variable	Unit	Mean		Difference
		Family hardship	No family hardship	
		(1)	(2)	(1) – (2)
Total assets	Rp million	6.153	15.100	–8.947
		(18.400)	(91.214)	
Equipment assets	Rp million	0.768	2.954	–2.186
		(2.915)	(53.302)	
Non-equipment assets	Rp million	5.385	12.200	–6.815
		(17.700)	(67.200)	
Asset purchases	Rp million	0.365	1.809	–1.444
		(1.702)	(23.489)	
Asset sales	Rp million	0.023	0.720	–0.697
		(0.249)	(14.014)	
Sole ownership		0.962	0.965	–0.003
		(0.192)	(0.183)	
Shares held by households	%	97.682	97.920	–0.238
		(12.154)	(11.574)	
Managed by household heads or spouses		0.747	0.840	–0.093
		(0.435)	(0.367)	
Year business started		1990	1991	–0.593
		(9.809)	(9.860)	
Number of workers		2.256	2.622	–0.366
		(4.966)	(8.953)	

Note: The numbers in parentheses are standard deviations. The number of observations of firms whose owners experienced family hardship is about 289; that of no family hardship 4,083. The values of stock of assets are the values on the day of the interview; the values of asset purchases and sales are those in the previous 12 months. These values are deflated by the Indonesia Family Life Survey's spatial consumer price index (see footnote 15).

old, on average, and employ about two or three workers. The firms in the sample are therefore very small.

These ownership and management characteristics suggest similarities between those firms whose owners experienced family hardship and those whose owners did not. Statistically, the differences between firms owned by bereaved and non-bereaved households do not differ from zero.

A greater contrast exists, however, between the assets of these two groups of firms: firms owned by bereaved households have, on average, Rp 9 million less in assets. The total assets of firms owned by bereaved households are about Rp 6 million; those owned by non-bereaved households, Rp 15 million. There are also marked differences in the values of equipment assets and 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.[19]

These large differences suggest that family hardship affects firms' assets. Firms whose owners experienced family hardship in the previous five years have, on average, 60% smaller total assets, 74% smaller equipment assets, 80% smaller asset purchases, and 97% smaller asset sales than those whose owners did not experience hardship.

RESULTS

In the basic specifications, I examine the effects on firms' total assets of the deaths of family members in the previous five years. I then look into the effects of other measures of family hardship. I also test whether the effects of family hardship vary by firms' size (by employment) and age. Finally, I analyse the effects by sub-sample to see whether the basic results are robust.

Family Hardship and Total Assets

Table 2 presents the basic results. Each column provides a different specification (with or without firm and owner characteristics), estimated using OLS. Because owners were interviewed over several months in 2000, to control for inflation over time all regressions include a set of dummies for the months of the interviews.

Column 1 shows (in a regression without any control variables) that family hardship is associated with a firm having 49% smaller assets—a large and statistically significant correlation. After controlling for a set of ownership and management variables, the estimate changes only to 43% (column 2). Controlling for further firm characteristics (sets of indicators for business fields, the age of the firms, and their locations at district level), the estimate remains large and statistically significant: the deaths of family members in the previous five years reduce firms' assets by 33%, on average (column 3). To ensure that family hardship is as random as possible, I include a set of household characteristics of owners. Even after I control for these owner characteristics, the effects of family hardship remain large: deaths of family members in the previous five years reduce firms' assets by about 30%, on average (column 4).

These large adverse effects of family hardship on firms' assets show that limited access to resources constrains the growth of micro and small firms. For example, owners may have to reallocate firms' cash to finance the health care of sick family members or to pay for the funeral of those who passed away—money that the firms could have used to invest in expansion. Owners' households may also have to assign employed family members to take care of the sick, or the firms may lose essential employees if the family members who passed away were managers. The fact that a typical micro or small firm finds it hard to cope with naturally occurring shocks like the deaths of family members suggests that such firms depend on the availability of internal resources.

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19. Rp 1 million in 2000 was worth about $103. Indonesia's GDP per capita that year was about $780.

TABLE 2 *The Effects of Family Hardship on Total Assets*

Dependent variable: logarithm of total assets	(1)	(2)	(3)	(4)
Family hardship	–0.49**	–0.43**	–0.33*	–0.30*
	(0.15)	(0.16)	(0.14)	(0.13)
Firm characteristics				
Ownership and management		yes	yes	yes
Business field, age, and location			yes	yes
Owner characteristics				yes
Observations	4,372	4,361	4,290	4,283
R^2	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 appendix table A1. All regressions include a set of dummies for the months of interviews.

* $p < 0.5$; ** $p < 0.01$.

Even though I control for entrepreneurship skills, work ethic, and life expectancy in equation (1), to the extent that these factors are specific to religion, ethnic group, and education level, the OLS estimator may overestimate the effects of family hardship; that is, equation (1) may still suffer from bias problems due to omitted variables. However, given the magnitude of the estimates (about 30%), the effects of family hardship are unlikely to be zero, even if I solve any bias problems.

Other Measures of Family Hardship

Table 3 shows the results using other measures of family hardship. In panel A, I use deaths of family members in the previous three years or the previous year, with firm characteristics and with or without owner characteristics. The results are quite robust overall: family hardship leads to 27%–41% smaller assets. The estimate of family hardship in row 2, in a specification that includes owner characteristics, is marginally significant statistically, possibly because of the small number of firms whose owners experienced 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 have lasting effects, so that firms owned by non-bereaved households (row 2) are not the appropriate control group for those owned by bereaved households.

In panel B, I use sickness of family members, crop losses, and natural disasters as measures of family hardship in the previous five years. There is no evidence that sickness of family members affects firms' assets; the magnitude of the effects is small, and the effects are insignificant statistically. Crop losses, however, have large adverse effects on total assets: farms whose owners experience crop losses have 10%–16% smaller total assets. These estimates are insignificant statistically, although it may be due to the small sample size—that is, the lack of power to reject the null hypothesis.[20]

20. The result in row 4 and column 2 of panel B is from a regression using 1,325 firms.

TABLE 3 *Other Measures of Family Hardship*

Dependent variable: logarithm of total assets		(1)	(2)
A. Family hardship in the previous three years or previous year			
Previous three years	(1)	–0.29*	–0.27
		(0.15)	(0.14)
Previous year	(2)	–0.41*	–0.30
		(0.18)	(0.18)
B. Using other measures of family hardship			
Sickness in the family	(3)	–0.06	–0.02
		(0.12)	(0.11)
Crop losses	(4)	–0.16	–0.10
		(0.19)	(0.18)
Natural disasters	(5)	0.62*	0.48
		(0.29)	(0.26)
C. Using all four measures of family hardship			
Deaths in the family		–0.32*	–0.30*
		(0.14)	(0.13)
Sickness in the family		–0.04	–0.005
		(0.12)	(0.11)
Crop losses		–0.13	–0.09
		(0.16)	(0.15)
Natural disasters		0.62*	0.48
		(0.29)	(0.26)
Firm characteristics		yes	yes
Owner characteristics			yes

Note: Each cell in panels A and 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 table A1. All regressions include a set of dummies for the months of interviews. The number of observations is about 4,300, except for row 4 in panel B (1,326), which includes farming households only.

* $p < 0.5$; ** $p < 0.01$.

The effects of natural disasters, such as flood, fire, or earthquake, are positive though insignificant statistically. Few owners experienced this type of hardship, which reduces the power of the test.[21] Moreover, many households hit by natural disasters received financial aid from the central or regional governments, which offset to some extent their financial losses. This complicates the estimation of the effects of natural disasters on the firms' assets.

In panel C, I include all four measures of hardship—deaths in the family, sickness in the family, crop losses, and natural disaster—in a regression. There is

21. Only 1.5% of micro and small firms in the sample had owners who experienced natural disasters.

no evidence that sickness in the family or crop losses affect firms' assets; natural disasters increase assets, though the estimates are insignificant statistically. Conversely, the estimates of deaths in the family remain economically large and statistically significant. Their magnitude (about 30%) is also similar to that of the basic results.

Overall, the results in table 3 are consistent with the basic results: major shocks like deaths of family members reduce the assets of firms. Minor shocks, like sickness in the family, make little difference. Crop losses may matter, but the small number of households affected leaves us with insufficient power to reject the null hypothesis. Natural disasters matter, too, but the government's aid for households in affected areas complicates the estimation of the effects of natural disasters on firms' assets.

For the rest of the analyses, I will use deaths of family members as the measure of family hardship for two reasons: (a) deaths of family members are sufficiently severe to affect firms' total assets (unlike sickness in the family); and (b) other measures of family hardship (for example, crop losses and natural disasters) either lack the power to reject the null hypothesis or complicate estimations of their effects.

Firms' Size and Age

I use the following model to estimate how the effects of family hardship vary by firms' size and age:

$$y_i = \alpha + \beta D_i + \zeta_1 Size_i + \zeta_2 Size_i * D_i +$$
$$\eta_1 Age_i + \eta_2 Age_i * D_i + \sum_j \gamma_j Firm_{ij} + \sum_k \delta_k Owner_{ik} + \varepsilon_i \qquad (2)$$

where $Size_i$ is the size of firm i by employment, Age_i is the age of firm i, and $Size_i * D_i$ and $Age_i * D_i$ are the interaction terms between family hardship experienced by the owner of firm i and the firm's size and age.

Table 4 presents the results. Each column in each panel provides a different specification, with or without owner characteristics, estimated using OLS.

In panel A, I introduce the number of workers within a firm and an interaction term between family hardship and the number of workers as additional explanatory variables.[22] Controlling for firm characteristics, the results in column 1 show that family hardship has large adverse effects on firms' total assets: owners' experiences of deaths in the family in the previous five years reduce firms' assets by almost 90%. Larger firms seem to cope better with family hardship, as the estimate of the interaction term indicates: having an additional worker reduces the adverse effects of family hardship on 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 of family hardship on assets are smaller than those

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22. To avoid endogeneity problems in the estimation of equation (2), I use as a measure of the size of firms the number of workers when the businesses were started, rather than the number of workers in 2000.

TABLE 4 *The Effects of Family Hardship by Firms' Size and Age*

Dependent variable: logarithm of total assets	(1)	(2)
A. Interaction with the number of workers		
Family hardship	−0.89**	−0.70**
	(0.24)	(0.25)
Number of workers	0.09*	0.07*
	(0.04)	(0.03)
Number of workers × family hardship	0.34**	0.24*
	(0.10)	(0.12)
B. Interaction with the age of firms		
Family hardship	−0.40*	−0.40*
	(0.18)	(0.17)
Age of firms	0.003	0.01*
	(0.005)	(0.005)
Age of firms × family hardship	0.01	0.01
	(0.01)	(0.01)
C. Interactions with the number of workers and age of firms		
Family hardship	−0.93**	−0.76**
	(0.26)	(0.27)
Number of workers	0.09*	0.07*
	(0.04)	(0.03)
Number of workers × family hardship	0.34**	0.24*
	(0.10)	(0.12)
Age of firms	−0.02	−0.02
	(0.01)	(0.02)
Age of firms × family hardship	0.004	0.01
	(0.01)	(0.01)
Firm characteristics	yes	yes
Owner characteristics		yes

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. Each of the regressions includes the variables and interactive terms listed above, and the firm and owner characteristics described in appendix table A1. All regressions include a set of dummies for the months of interviews. Regressions in panels B and C do not include dummies for the years that the firms started. The number of observations is about 4,300.

* $p < 0.5$; ** $p < 0.01$.

in column 1, though they remain very large (70%). 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 the firms' age as additional explanatory variables. Controlling for firm characteristics only, or for both firm and owner characteristics, I find that family hardship reduces total assets by 40%, on average. There is no evidence, however, that family hardship affects young and old firms differently (as

indicated by the estimates of the interaction terms, which are economically small and statistically insignificant).

I then include both interactions between family hardship and firms' size and age. Overall, the results are robust: (a) the adverse effects of family hardship are economically large and statistically significant; (b) the smaller the firms, as indicated by the number of workers, the larger the adverse effects; and (c) there is no evidence that family hardship affects young and old firms differently.[23]

Equipment Assets and Asset Purchases and Sales

Table 5 presents the effects of family hardship on the stocks of equipment and non-equipment assets, purchases and sales of assets, and expenses and revenues. Each cell provides an estimate of family hardship in a different specification, with or without owner characteristics, with the logarithm of equipment assets, asset purchases, asset sales, expenses, and revenues as the dependent variable, estimated using OLS.[24]

Panel A presents the effects of family hardship on equipment and non-equipment assets. There is no evidence that deaths of family members affect firms' equipment assets: the estimates are positive but insignificant statistically, with standard errors two to three times as large as the estimated coefficients.

There are, however, large adverse effects of family hardship on non-equipment assets, as row 2 shows. Family hardship reduces firms' non-equipment assets (such as land, buildings, and vehicles) by more than 65%, on average, though the estimates are significant statistically only at the 10% level.

Panel B presents the effects of family hardship on purchases and sales of assets in the previous 12 months. There is no evidence that deaths of family members in the previous five years affect firms' asset purchases in the previous 12 months. The estimates are small and statistically insignificant, with standard errors more than six times as large as the estimated coefficients. Family hardship seems to reduce assets sales by about 30%, on average. The estimates are only marginally significant statistically, but this does not mean that family hardship does not affect owners' decisions to sell assets. Only one in about 21 firms sold assets in the previous 12 months—too few to reject the null hypothesis.

Panel C presents the effects of family hardship on firms' revenues and expenses in the previous 12 months. There is no evidence that family hardship affects firms' business operations. The estimates are statistically insignificant, with standard errors two to seven times as large as the estimated coefficients.

These results, along with the basic results and the extensions in the previous subsections, show that family hardship does affect firms' total assets. There is no evidence that family hardship in the previous five years affects firms' investment in equipment assets or asset purchases and sales in the previous 12 months, nor

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23. As I expected, larger firms (measured by the number of workers) have more valuable assets (panels A and C); older firms also have larger assets (panel B), but the estimates are statistically insignificant when I include in the regression the number of workers and its interaction with family hardship (panel C).

24. Asset purchases, asset sales, expenses, and revenues are flow variables for the period of the previous 12 months; equipment and non-equipment assets are stock variables.

TABLE 5 *The Effects of Family Hardship on Stocks of Assets and Flows of Investment*

Dependent variable: logarithm of assets, revenues, or expenses		(1)	(2)
A. Equipment and non-equipment assets			
Equipment assets	(1)	0.14	0.17
		(0.30)	(0.31)
Non-equipment assets	(2)	–0.68	–0.66
		(0.41)	(0.40)
B. Assets purchases and sales			
Asset purchases	(3)	–0.01	0.09
		(0.39)	(0.39)
Asset sales	(4)	–0.31	–0.28
		(0.18)	(0.18)
C. Revenues and expenses			
Revenues	(5)	–0.04	–0.02
		(0.14)	(0.14)
Expenses	(6)	–0.06	–0.09
		(0.18)	(0.17)
Firm characteristics		yes	yes
Owner characteristics			yes

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 appendix table A1. All regressions include a set of dummies for the months of interviews. The number of observations for regressions in panels A and B is about 4,300; in panel C about 2,500–3,000.

* $p < 0.5$; ** $p < 0.01$.

is there evidence that family hardship affects firms' revenues and expenses in the previous 12 months. The results do suggest, however, that firms owned by bereaved households reduce investment in non-equipment assets (such as land, buildings, and vehicles) or increase their non-equipment investment by a smaller amount than non-bereaved households, which leads to slower growth or fewer total assets.

Taken as a whole, these results show that firms owned by bereaved households invest like those owned by non-bereaved households in assets crucial to their survival (such as equipment assets). Yet they seem to invest smaller amounts in less important assets such as non-equipment assets, or they are more likely to sell these liquid assets when the owners are experiencing family hardship. Even though there are lasting effects of family hardship on stocks of assets, there is no evidence that family hardship affects firms' operations in the previous 12 months. As the estimates of the effects on assets sales, assets purchases, expenses, and revenues indicate, there is no evidence that firms perform differently in the previous 12 months, even though their owners experienced family hardship in the previous five years.

TABLE 6 *Effects by Subsample*

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

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 appendix table A1. All regressions include a set of dummies for the months of interviews. The number of observations ranges is about 2,300–4,000.

* $p < 0.5$; ** $p < 0.01$.

Robustness Checks

Table 6 presents some robustness checks. Each cell shows the effects of family hardship on total assets, using different subsamples of firms.

In panel A, I exclude very small firms (in terms of total assets) and include firms whose total assets exceed Rp 50,000 or Rp 500,000. Both regressions, with or without owner characteristics, show that the results are quite robust. The effects are economically large and statistically significant: family hardship, using these subsamples, reduces total assets by 26%–30%. These estimates become statistically insignificant if I exclude firms whose total assets are below Rp 500,000, possibly because of the decline in the number of observations.[25]

In panel B, I exclude very large firms and include firms that employ at least 20 workers or at least 10 workers. The results are also robust: the adverse effects are about 30%, which is economically large and statistically significant.[26]

CONCLUDING REMARKS

Major family hardship experienced by owners of micro and small firms slows down the growth of the firms or reduces their assets. Deaths of family members

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25. Restricting total assets to at least Rp 500,000 lowers the sample size to about 3,700 micro and small firms.

26. I also analyse a subsample that excludes firms that employ more than five workers. I find statistically insignificant estimates of the effects of family hardship, possibly because of the small sample size.

strain the financial positions of owners' households and those of their firms, which suggests that limited access to resources such as internal finance and a pool of family workers severely constrains the growth of micro and small firms.

This finding is not surprising; it is obvious that limited access to resources constrains the growth of micro and small firms (Carpenter and Petersen 2002; Guariglia, Liu, and Song 2011; Cruz, Justo, and De Castro 2012). Empirically, however, it is unclear how severe these constraints are. It may not be obvious whether naturally occurring economic shocks like deaths of family members affect the growth of micro and small firms, and, if they do, how greatly. In this paper I show not only that naturally occurring shocks like deaths of family members constrain the growth of micro and small firms but also that the adverse effects are long-lasting and economically large: experiencing the death of at least one family member in the previous five years reduces firms' assets by 30%, on average.

These findings are also in line with the literature on the effects of family hardship on the welfare of the poor, many of whom own micro firms. Gertler and Gruber (2002), for example, find that Indonesians consume 20% less when a household member falls severely sick; Duryea, Lam, and Levison (2007) show that children in Brazil are more likely to drop out of school and work when their male household head becomes unemployed; Gertler, Levine, and Ames (2004) find that the recent death of a parent reduces children's school enrolment in Indonesia. Given the intense competition among micro and small firms, their lack of access to formal insurance and external finance, and the adverse effects of family hardship on the welfare of the poor, it is not unexpected that owners of such firms find it difficult to cope with severe hardships like deaths of family members, which slow firms' growth.

These results imply that to promote the growth of micro and small firms, governments in developing countries like Indonesia may need to help such firms weather severe family hardship. If micro and small firms cannot cope with naturally occurring shocks like deaths of family members, it decreases the likelihood that they will survive, let alone expand to become medium or large firms. At a macro scale, if micro and small firms continue to dominate markets in developing countries, these countries will fail to exploit economies fully and grow more slowly than their potential suggests.

In response, the government could pursue a policy of microfinance development. Thriving microfinance increases micro and small firms' access to external finance and decreases their reliance on internal finance (Tsukada, Higashikata, and Takahashi 2010)—more important, it also allows owners to insure their consumption against health shocks, which would help micro and small firms withstand these shocks (Gertler, Levine, and Moretti 2009). The government could also reduce the costs of doing business, and help micro and small firms to register formally, which would allow them to secure external finance and hire non-family workers more easily (McCulloch, Schulze, and Voss 2010). Improved welfare programs and social health insurance policies would not only help poor households cope with economic shocks but also promote the growth of micro and small firms. Sparrow, Suryahadi, and Widyanti (2013), for example, find that Askeskin (social health insurance for the poor) successfully targets the poor and improves their access to health care, but questions remain about whether the quality of these services is good enough and their coverage comprehensive enough. Because micro firms face high levels of risk, and because cheap insurance may induce owners to

invest more and take more risk, the government could also consider paying a proportion of insurance premiums for the poor, to support micro and small firms.[27]

One limitation of this article is that it does not estimate the effects of limited access to one particular resource. The family hardship variable, for example, does not only measure the availability of internal finance but also the number of workers employed by each firm. Deaths of family members may also hamper the productivity of those workers and managers who are also family members, and this lower level of productivity in turn leads to slower growth.

It would be worthwhile exploring the mechanisms through which family hardship affects the growth of micro and small firms. Yet given the magnitude of the effects of family hardship that I identify in this article, and the plausibility of the exogenous shocks that I exploit, I can conclude that limited access to external resources causes micro and small firms to grow more slowly when their owners experience family hardship.

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27. Karlan et al. (2012), for example, find that cheap insurance induces farmers in Ghana to take more risk.

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APPENDIX TABLE A1 *Descriptions of Variables*

	Variable	Note
Key variable	Family hardship	1 if experienced death in the family in the previous five years; 0 otherwise
Firm characteristics	Ownership and management types	
	Sole ownership dummy	1 if sole ownership; 0 otherwise
	Percentage of shares held by members of households	
	Dummy: managed by household heads or spouses	1 if managed by household head or spouse; 0 otherwise
	Dummies: owners who are non-members of households	A set of dummies for a combination of owners
	Dummies: owners who are members of households	A set of dummies for a combination of owners
	Dummies: operating outside home	A set if dummies for inside home, partially inside, or outside
	Business field, age, and location	
	Dummies: business field	A set of dummies, one for each business field
	Dummies: year started business	A set of dummies, one for each year
	Dummies: location (at district level)	A set of dummies, one for each district
	Dummy: urban or otherwise	1 if urban; 0 otherwise
Owner characteristics	Household size (number of members)	
	Average number of years of schooling of household head and spouse	
	Average age of household head and spouse	
	Number of children who are in school	
	Number of mature children	
	Dummies: ethnic groups	A set of dummies, one for each ethnic group
	Dummies: religion	A set of dummies, one for each religion