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Initial Insights from Philippine SMEs

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ABSTRACT

Households and businesses need to cope and thrive in an increasingly shock-prone world. Development and poverty reduction strategies need to take careful account of efforts to promote not just more resilient households and communities; but also more resilient firms on which many jobs and livelihoods depend on. Public sector and donor support for disaster- and crisis-hit communities is critical; but it is only when firms get back up that the community is able to recover fully. Once firms are able to start operating again, then workers are able to return to their jobs and the domestic economy is able to return to normal. Stronger resilience over time is also expected to reflect more robust economic competitiveness and yield more robust investments. The goal of this study is to assess the resilience of the Philippines' small and medium scale enterprises (SMEs) during economic and environmental shocks. The main focus here is on firms' resilience during the global financial crisis and economic slowdown in 2008-2010 and the major floods that hit the country in 2009 and 2011. These climate-related shocks affected cities such as Marikina, Iligan, and Cagayan de Oro. SMEs in these cities will be the main focus of this study.

JEL: D20, H41, O12, O43, P48

Key Words: aggregate shocks; crisis resilience; SMEs; consumption and investment smoothing

Introduction

The world is increasingly becoming shock prone and families and businesses need to cope and thrive despite the rising number of crises and aggregate economic and climactic disturbances. The Asian region is among the most vulnerable to natural hazards in the world—home to about 1 death per 1,000 square kilometers from natural hazards (double the global average of 0.5 deaths per 1,000 square kilometers) and accounting for about 50% of the world's estimated economic cost of disasters over the past 20 years. The estimated average loss incurred by the ASEAN from disasters is more than $19 billion every 100 years, and yet less than 5% of disaster losses in developing Asia are insured as compared to the 40% in developing countries (ADB, 2013).

In the Philippines, a single typhoon, Ondoy, caused an estimated damage of US $ 254 million (The Philippine Star, 2011). On the other hand, the 2011 flood in Thailand resulted in an estimated cumulative damage of US $ 45 billion (AON Benfield, 2012). Unless measures to reduce disaster risk and improve preparedness are put in place, the increasing frequency of disasters has the ability to disrupt the region's economic growth and poverty reduction efforts.

Albeit temporary, these crises still tend to have persistent consequences, depending on the resilience of the individuals, households, firms and other entities in a community or country. This helps to establish the main rationale for public action in this area – to preserve and promote economic and social returns through substantial reduction of risk and vulnerability (Fuentes-Nieva and Seck, 2010). It is a known fact that the poor are the most vulnerable to various types of crises, as they have less capability to cope with risks (Lokshin and Yemtsov, 2004), so that policies to reduce risk should be at the core of poverty reduction efforts (e.g. Harper et al, 2012; Fuentes-Nieva and Seck, 2010; Mendoza, 2009a; Skoufias, 2003).

Thus promoting more resilient firms and production chains could also be part of strategies to strengthen the resilience of communities. The implicit rationale here is simple. Public sector and donor support for disaster- and crisis-hit communities is critical; but it is only when firms get back up that the community is able to recover fully. Once firms are able to start operating again, then workers are able to return to their jobs and the domestic economy is able to return to normal. Stronger resilience over time is also expected to reflect more robust economic competitiveness and yield more robust investments.

The goal of this study is to assess the resilience of the Philippines' small and medium scale enterprises (SMEs) during economic and environmental shocks. The main focus here is on

firms' resilience during the global financial crisis and economic slowdown in 2008-2010 and the major floods that hit the country in 2009 and 2011. These climate-related shocks affected cities such as Marikina, Iligan, and Cagayan de Oro. SMEs in these cities will be the main focus of this study.

A second objective is to empirically examine crisis coping behavior of SMEs and its possible implication on economic competitiveness and the resilience of households. The key questions to be answered by this study are the following:

1. How are firms affected by economic or environmental shocks?
2. What mechanisms were adopted by firms to cope with the crisis or disaster? (What were the effects after these mechanisms were adopted?)
3. What policies could help to lower firms' risks over time and boost resilience in the immediate aftermath of shocks?
4. What characteristics of firms and the jurisdictions they operate in, and which coping strategies, seem to be associated with stronger crisis resilience?

In what follows, section 1 provides a review of related literature, while section 2 develops the analytical framework for this study. Section 3 then describes the empirical methodology and data. Section 4 contains the main analysis of findings, and a final section revisits initial findings for policymakers.

I. Review of Literature

Most of the literature on crisis resilience examined household-level data in order to better understand how families and individuals cope with aggregate shocks. Very few studies have focused on firm-level data, and the ways in which firms and entrepreneurs adjust to these same shocks.

Household Resilience

Studies of household coping behavior provided evidence that the types of coping pursued by households tend to vary with their characteristics—and often types households that are poorer tend to cope in harsher ways. Lokshin and Yemtsov (2004), for instance, explored the coping strategies that respondents adopted during the Russian financial crisis of August 1998. Their

study found evidence that the level of human capital was a major factor behind the choice of survival strategies. That study established clusters of different coping activities:

- (C1) Active strategies or relying on household resources (e.g. increase home production, change in place of residence, finding supplementary work, renting out an apartment);
- (C2) Relying on social networks (e.g. turning to friends and relatives or government for assistance), and;
- (C3) Passive or cuts in household expenditures (e.g. cutting on spending or taking fewer holidays).

The study identified the passive cluster (C3) as akin to marginalization during a crisis; and it focused on identifying the households that only chose activities in this cluster. The most widely used coping mechanisms were also the least effective (i.e. the questionnaire also asked the respondent to rate the helpfulness of each mechanism). A cross tabulation of expenditure deciles vs. coping strategies showed that the poor are doubly constrained—they face a limited set of coping alternatives and these alternatives also tend to be least effective and likely to impact their human capabilities in the longer run (e.g. cutting on human capital spending).

The study also estimated three regression equations with three different dependent variables by using maximum likelihood method. This system of equations was estimated by the following explanatory variables: household-specific factors (e.g. household size, age of head, level of education of head, etc.), locality factors (e.g. local unemployment rate and level of inequality), and previous working history of the household head. The two main findings of the study were that: a) welfare or consumption before the crisis had positive correlation with C1 and negative correlation with C2 implying that poorer households rely more on soliciting help, and b) those who turned to C3 types of coping strategies were mostly pensioners in urban households.

The results also showed that the households with the following characteristics were more at risk: household head was a pensioner, smaller household, household head with high school diploma only, and higher level of unemployment in the locality. There was also a negative effect of land ownership on the probability of relying on passive response. In short, they were predominantly urban pensioners and poorly educated pre-retirement individuals.

Similarly, del Ninno et al (2001) examined the impacts of the 1998 floods that occurred in Bangladesh which caused severe damage to rice crops and threatened the food security of tens of millions of households. That study analyzed the adjustments of households to the shock which

typically included: reducing expenditures, selling assets, and borrowing. A majority of the households (60% of the sample) coped by borrowing, resulting in a rise in average household debt of 1.5 months of typical consumption (compared with a small percentage of monthly consumption about eight months before floods). The borrowing was able to keep the value of household expenditures at the pre-flood levels. But higher prices forced flood-affected poor households to consume fewer calories per capita, per day when compared to non-flood-exposed households. This finding implied that targeted cash transfers and credit programs could have been an effective complement to direct food distribution (del Ninno et al, 2001). Thus, information on poor and vulnerable households could help sharpen crisis response policies.

In addition, Datt and Hoogeveen (1999) used household survey data for 1998 to analyze the effect of the financial crisis in the Philippines and found that in terms of the impact on poverty, the relatively greater shock was caused by the El Niño weather phenomenon. The labor market shock was progressive (reducing inequality). However, the El Niño shock turned out to be more regressive (increasing inequality). Certain community and household characteristics mitigated the impact of the shocks. For example, landowners were much more affected by El Niño shocks. Nevertheless, households with higher levels of education were affected more by wage and employment shocks. Predictably, more commercially developed communities were much more affected by the financial crisis. Yet, occupational diversity within a household helped mitigate the adverse impact, suggesting that household resilience could be strengthened through better diversification of income sources. While some better-off households were able to smooth consumption, the poor were less able to protect their consumption (Datt and Hoogeveen, 1999).

Fuentes-Nieva and Seck (2010) also found that in the absence of credit or insurance markets, short-term survival was often chosen over a longer-term perspective of welfare in most crisis situations (e.g. lessening of food intake of children or dropping out of school which affects their future chances). Uninsured risk changes investment behavior where for example, asset-poor households devoted a larger share of land to safer traditional varieties of rice and castor than to riskier but higher-return varieties. Such events occurred in a very short time period but permanently diminished the set of choices that people have. One-time shocks not only created immediate consequences, but might also result in lifetime consequences or by changing the life-paths of their victims. The two authors also distinguished between risk management strategies (before the shock occurs) and risk-coping strategies (once the shock occurs).

Skoufias (2003) also summarized studies by the International Food Policy Research Institute (IFPRI) and the Inter-American Development Bank (IADB), concluding that poorer households have less ability to deal with shocks and may choose coping strategies that keep them poor (e.g. selling productive assets like draft animals, decreasing human capital of their children) or transmitting poverty from the current generation to the next. Hence, through these two channels, a short-lived shock might have adverse effects in the long run.

What did we take away from all these studies?

Governments should provide safety nets during shocks, but these programs must also contribute to poverty alleviation in the long run. With regards to public actions to minimize exposure to and impact of shocks, there were several instruments to be used (e.g. cash transfer and public work programs, unemployment assistance, wage and commodity price subsidies, targeted human development or cash transfer programs conditioned on school attendance and regular visits to health centers, service fee waiver, food and nutrition programs, micro-finance and social fund programs, etc.), but predictably each demonstrated its own advantages and disadvantages. It appeared that ex-ante risk reduction programs put in place before a crisis occurs tended to be more effective and give more value for money as compared to ex-post mitigation and coping programs as they seemed to enhance welfare as well as reduce poverty at the same time (Skoufias, 2003).

Resilience of Enterprises

Few studies covered the vulnerability of firms to aggregate economic shocks, including the Asian financial crisis of 1997-1998 and the global financial crisis that erupted in 2008.

The Asian crisis was rooted in the involvement of major conglomerates in banking and investment, and therefore relatively large firms are affected more severely (as smaller firms rely on self-finance and do not rely as much on formal financial institutions) (Berry et al, 2001). In Indonesia, where the crisis peaked in 1998, causing its GDP to contract by 13%, the most common coping strategies of firms included decreasing the number of workers and using cheaper inputs instead of imported materials (Berry et al, 2001).

In the Republic of Korea where policies were skewed towards large firms, the government played a major role in helping SMEs survive the crisis by restructuring the financial sector with a focus on providing financing for SMEs that are knowledge and technology

intensive companies. This policy helped to increase loans to SMEs, boosting the investment of SMEs notably in R&D to reinforce their technological competitiveness. The assistance of government policies helped SMEs fight their vulnerability and even compete internationally. Arguably, such a strategy contributed to the inclusiveness of the recovery process in Korea, perhaps even contributing to its v-shaped economic recovery from the Asian crisis (Gregory et al, 2002).

Some studies called for size-neutral policies rather than size-specific ones. In Indonesia, the effect of the Asian Financial Crisis is known to be an industry and location specific crisis as shown by the data that the manufacturing and other urban-centered sectors registered a double digit negative growth in 1998 (Sato, 2000). The metalworking and machinery industries were hit the hardest, recording a decline of 52%. However, looking at the data closely showed that small firms in the manufacturing sector recorded a positive value added despite the crisis (Sato, 2000).

Sato (2000) hypothesized that the performance of SMEs varied even in the same industry and location. Using data from 50 enterprises in Java from 1997-1999, his study showed that 65% of the firms in sector were affected negatively, but performance varied. Some enjoyed a turnover that was higher than their pre-crisis level. No correlation was found between size and performance during crisis, thus generalizations for SMEs did not appear cogent (Sato, 2000).

Using firm-level data in Indonesia, Narjoko and Hill (2007) also found that firm location, foreign ownership and prior export orientation were significant determinants of firm survival and recovery during the crisis of 1997-1998. Similar to Sato, that study found that firm size was found to be an ambiguous factor for firm survival and recovery.

Further, Wengel and Rodriguez (2006) used the Annual Manufacturing Survey of 1996 and 2000 of 20,000 Indonesian industrial enterprises and discovered that the Asian financial crisis caused 6,100 firms to shut down, but 5,277 new firms started during the same period—possible proof that the response of SMEs varied. While most closed down, a number still took advantage of new opportunities. Post-crisis firms also seemed to be more export-oriented than pre-crisis ones (Wengel and Rodriguez, 2006). While there could be a number of factors behind this, it is likely also connected to the much more competitive currencies in the aftermath of the Asian crisis.

As regards the global financial crisis that erupted in 2008, Balisacan et al (2010) traced its impact on Philippine national output using regression and decomposition techniques and

constructed an augmented panel data from national household surveys to simulate the differential effects of the crisis across population and social groups. The study found evidence that the global financial crisis pushed down the GDP growth rate from its long-term trend by 1.0 percentage points in 2008 and 3.8 percentage points in 2009. The industry sector was hit the hardest. The study also talked about several government programs such as the Economic Resiliency Plan (ERP), which aimed to stimulate the economy through tax cuts, increased government spending, and public-private sector projects that could cushion the impact of future upturns in the global economy. Their study emphasized the importance of building productive assets that would form the foundation for a faster but more inclusive recovery and growth.

Furthermore, Tambunan (2009) drew from survey data of Japanese export-oriented firms and found evidence that the major adjustment measures adopted by firms included: (1) seeking out new customers or markets since the slowdown was a demand crisis; and (2) labor-related adjustments such as reducing working time, developing alternative work arrangement and laying-off workers. The study also conveyed that females are included in the most retrenched workers. In Japan, the global economic slowdown rapidly deteriorated the business climate mainly through a plunge in exports. The government responded through an allotment of ¥30 trillion in SME financing-related measures for those more vulnerable to decrease in sales particularly subcontractors (JSBRI, 2009). Apparently, not only export-oriented manufacturers have been hurt. In countries heavy on tourism, the economic slowdown was expected to hurt travel and tourism enterprises (ADB, 2009). This underscored the importance of understanding crisis transmission mechanisms so that firms connected most to the sources of the crisis shock could be expected to be affected the most.

In Cambodia, the global financial crisis affected key industries, such as garments, tourism, construction and agriculture, which drove the growth of the Cambodian economy. A survey of 120 SMEs in the construction and tourism sector in the provinces of Phnom Penh and Siam Reap conducted in 2011 showed that the most common coping mechanisms used by SMEs during the crisis included reducing staff (28.3%), saving costs (13.3%), and reducing utilities expense (11.7%) (Ngin, 2012).

In addition, a multi-country study covering some Asian economies analyzed the WBES data and found that the global crisis resulted in more severe employment reduction among skill-intensive firms, larger contraction in sales in younger firms, and decline in sales among

innovative firms in Eastern Europe and Central Asia (Correa and Iooty, 2010). More than a third of firms in some countries in Eastern and Central Europe considered reducing their workforce within six months (Ramalho et al., 2009). In the same region, another study showed that in four out of six countries surveyed, the percentage of firms with overdue financial obligations rose from 2009 to 2010 (Correa et al., 2010).

Guimbert and Oostendorp (2012) focused on the risk coping behavior that required smoothing of inputs (labor, raw materials, or capital). The data used comes from a panel of Cambodian firms from 2008 to 2009. Using a theoretical framework that analyzed the responsiveness of inputs to demand shocks, the study found that although the degree to which firms adjusted inputs differ, firms without credit constraints were more able to smooth their use of inputs when shocks are perceived as temporary.

The ability to smooth or hoard inputs was based on liquidity constraints, thus credit-constrained firms dealt with incomplete smoothing or sub-optimal smoothing or imperfect smoothing, i.e. reducing inputs (reduce hiring, increase firing, reduce inventory of raw materials and reduce production capacity) significantly even if they expected the downward shock to be temporary, and leading to a welfare loss due to incomplete risk coping. The study found that credit constrained firms were less able to maintain their productive capacity, thus incurring higher adjustment costs in the future. (The study estimated the loss at 44.4 times the adjustment costs of the firms without credit constraints.)

Adjustment of inputs was based on the presence of credit constraints and expectations on duration of the negative shock, but the size of the adjustment depends on adjustment costs, the price of inputs, the size of the demand shock, the persistence of the shock, and the availability of finance. The desire to smooth when there is a negative shock was due to adjustments costs. For example, the study found that the reduction of unskilled and non-production workers were greater because adjustment cost was higher for firing or hiring skilled workers. The study concluded with three policy implications:

- Contagion Effect: The higher response of the labor market to the demand shock (by sub-optimal smoothing) reflected a constraint on the capital market. The relevant policy to adjust was therefore financial policy. By reducing credit during crises, capital markets may tend to exacerbate shocks.

- Role of policies to absorb sub-optimal smoothing: This emphasized the role of social safety nets. Emerging sectors will not be able to provide full smoothing for temporary shocks; and therefore public policy could play a key role notably in preventing harm to human development and human capital.
- Macroeconomic policy: If all firms perceived the shock as permanent, there could be a negative demand feedback loop or their combined reaction of smoothing inputs will make the shock more permanent. Thus, to the extent possible, there was a role for the public sector to help assure that the shock is quickly mitigated, and also send a credible signal that the shock was temporary in nature.

Environmental Crises

Even fewer studies examined how firms cope with natural disasters. Those that focused on the recent disaster events do not specifically use firm-level data. For instance, Lempert et al (2013) saw that the recent flood risk reduction efforts of Ho Chi Minh City may be insufficient as climate and socio-economic conditions deviate from projections made during the initial planning of those efforts. To help the city develop a better risk management strategy in the face of an unpredictable future, the study used robust decision making (RMD) to analyze flood risk management in Ho Chi Minh City's Nhieu Loc-Thi Nghe canal catchment area. RMD is "an iterative, quantitative, decision support methodology designed to help policy makers identify strategies that are robust, that is, satisfying decision makers' objectives in many plausible futures, rather than being optimal in any single estimate of the future" by running models thousands of times to estimate the performance of proposed plans over different combinations of uncertainties. The results showed that the soon-to-be-completed infrastructure may reduce risk in best estimates of future conditions, but was not as effective in many other plausible futures (Lempert et al, 2013).

There were also studies of country-specific crises. Ando and Kimura (2012), for example, studied the similarities and differences of the responses of Japanese machinery exporters to two major crises: the global financial crisis, described as a demand shock and the East Japan earthquake, a supply shock. The reaction to the global financial crisis, whose negative effects were larger and more prolonged, were permanent, such as the shrinkage of the basis of the Japanese exports and the realization of the increasing importance of trade with other East Asian

countries. The East Japan earthquake also influenced structural reforms but corporate activities quickly returned to the original production in a shorter span of time (Ando and Kimura, 2012).

Moving forward, further studies on the vulnerability of firms in times of crisis or on the coping strategies of Asian firms during crisis is much needed. The likely lasting consequences of these coping strategies to crisis can be further examined, as well as possible implications as far as public policy and business strategy (e.g. retrenchment of skilled workers during the crisis, and implication for innovation and R&D during the recovery). Job creation during the recovery and the link between democracy and business reforms can also form part of the thematic focus of these proposals.

II. Analytical Framework

While there were many approaches to define and operationalize the concept of resilience, Frankenberger et al (2012) provided a useful starting point, which states that resilience is "the ability of countries, communities, and households to anticipate, adapt to, and/or recover from the effects of potentially hazardous occurrences (natural disasters, economic instability, conflict) in a manner that protects livelihoods, accelerates and sustains recovery, and supports economic and social development."

Different resilience assessment frameworks developed first with the "system of interest" or "unit of analysis"—identifying who or what is adapting (Smit and Pilifosova, 2001; Frankenberger et al, 2012). The units of analysis in this paper were micro, small and medium scale enterprises. Hence, following the approach in the literature, the resilience of the unit of analysis depended on context (environmental, political, social, economic, historical, demographic, religious, conflict and policy conditions, etc.), the disturbance itself (form, magnitude, frequency, and duration of shocks), and adaptive capacity (nature and extent of access to and use of resources in order to deal with disturbance in the form of livelihood assets, structures and processes, and livelihood strategies) (Frankenberger et al, 2012).

The relations of firms with other stakeholders (customers, suppliers, competitors, partners, investors, etc.), capital, labor, product markets in which firms operate, and the quantity and quality of support from the government and other institutions, also affected the way firms cope with the crisis and their performance (Kitching et al, 2009).

Smit and Pilifosova further expounded on adaptive capacity, which they explain was affected by:

- Economic resources – wealth and poverty were rough indicators of the ability to cope;
- Technology – the unit's level of technology and ability to develop new ones affected the range of possible responses to risk;
- Information and skills – Among other examples, this included "lack of trained and skilled personnel, lack of systems for dissemination of information, lack of forums for discussion can limit adaption options";
- Infrastructure – This mitigated the flexibility to deal with risks (e.g. alternative source of energy or drainage system to accommodate flood);
- Institutions - Inadequate institutional support was frequently cited in the literature as a hindrance to adaptation; in developed countries, they facilitated management of risks and provide capacity to deal with future risks;
- Equity - Some researchers regarded the adaptive capacity of a system as a function of availability of and access to resources by decision-makers and vulnerable subsectors of a population; differentiation in demographic variables (age, gender, ethnicity, educational attainment, health, etc) were related to the ability to cope with risks as they may prevent access to finance or infrastructure.

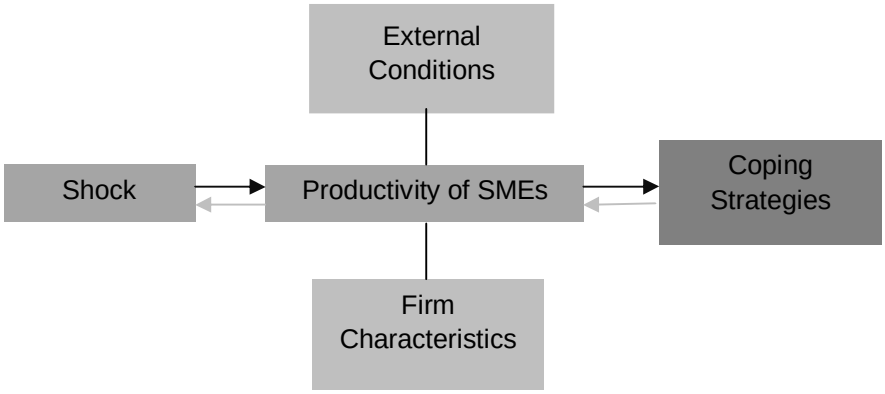
Most resilience frameworks used households as their unit of analysis. There were studies that focused on competitiveness of firms that can also be used in a crisis context. Kumar and Chadee (2002), for example, combined elements from different theoretical perspectives to develop a conceptual model for the competitiveness for firms in Asian developing countries, which are on average small, technologically underdeveloped with unskilled workers, and operate within an underdeveloped financial sector. Their model identified three factors internal to the firm that can enhance competitiveness: (i) flexibility and cooperation with outside organizations, (ii) innovation, and (iii) human resource orientation.

Arguing that external factors that firms face were also important, the model also included the role of government in supporting business and industrial development. The authors cited the lack of access to finance after the Asian financial crisis as an example to support the fact that access to capital and other financial resources, which the government can control, was necessary for firm growth and survival.

How units cope with the shock was often measured by sensitivity (i.e. the degree to which the unit will be affected by a given shock or stress), resilience, and livelihood outcome (i.e. needs and objectives the unit is trying to realize) (Frankenberger et al, 2012). Most frameworks viewed resilience as a process rather than a static state (Smit and Pilifosova, 2001; Frankenberger, 2012).

Combining the different studies on assessing the resilience of households and firms, this paper used the framework below:

Figure 1. Theoretical Framework on Crisis Resilience



Source: Authors' own elaboration, drawing on the review of literature.

Put simply, when an aggregate shock takes place, firms were already in a certain context and possessed a set of specific characteristics that will moderate its effects. Both external conditions and firm characteristics affected firm productivity and the coping strategies that they will choose. Productivity was also affected by the shock, but it could also act as a mitigating factor for the shock itself. An over-all assessment of these various factors could therefore provide a sense of how resilient the firms were; and to what extent this resilience was moderated by various factors that matter to its competitiveness.

III. Data and Methodology

As a contribution to the scant literature in this area, this study examined data on firms' crisis coping strategies, drawn from the 2012 AIM-ADB Enterprise Survey conducted from July 16 to December 8, 2012. The survey covered 2,040 MSMEs in 34 cities in the Philippines. A total of

60 business enterprises were surveyed in each city. The cities included in the survey are listed in Table 1.

Table 1. Cities Included in the Survey

Luzon (17 cities)	Region
Baguio	CAR
Dagupan	I
San Fernando, La Union	I
Santiago	II
Tuguegarao	II
Angeles	III
Olongapo	III
Lucena	IV
Batangas	IV
Puerto Princesa	IV
Naga	V
Legazpi	V
Marikina	NCR
Pasay	NCR
Quezon City	NCR
Taguig	NCR
Valenzuela	NCR
Visayas (7 cities)	Region
Iloilo	VI
Bacolod	VI
Cebu	VII
Mandaue	VII
Lapu-Lapu	VII
Tacloban	VIII
Ormoc	VIII
Mindanao (10 cities)	Region
Zamboanga	IX

Pagadian	IX
Cagayan de Oro	X
Iligan	X
Davao	XI
Tagum	XI
General Santos	XII
Cotabato	XII
Butuan	CARAGA
Surigao	CARAGA

Source: AIM Policy Center.

We used stratified random sampling using firm size. We also adopted the definition of firm size used in the Philippine Magna Carta on MSMEs. Hence, the grouping was based on asset values:

- Micro: Php3M and below
- Small: more than Php3M to Php15M
- Medium: more than Php15M to Php100M

The strata distribution was comprised of 30 Micro, 15 Small and 15 Medium per city. A floor on asset value and employment, Php1M and 5 employees respectively, was also introduced to filter the sample. The survey contains several modules:

- Baseline module (contains the characteristics of the entrepreneur that can serve as possible correlates for analyzing other issues)
- Public goods provision and economic governance
- Innovation
- Finance
- Crisis resilience

Using statistical and econometric analysis, the study focused on the crisis resilience module and used the baseline module when needed.

Descriptive Analysis

Three observations were dropped out of the 2,040 firms because the asset values of the firms were beyond the Php 100M, which placed them in the large size category. There were 838 out of 2,037 firms that experienced at least one form of economic or environmental shock as outlined in the questionnaire. This number was based on the firms that responded that the global financial crisis had moderate to very high effect on their businesses, or that that they experienced any form of disaster or calamity. The dataset included various industries affected by economic or environmental shocks (Table 2).

Table 2. Industries Affected by Economic or Environmental Shocks

Current Primary Economic Activity (PSIC)	Firms affected by any shock	Firms not affected	Total number of firms
Agriculture, Hunting & Forestry	7	4	11
Manufacturing	66	117	183
Electricity, Gas, and Water	6	19	25
Construction	4	7	11
Wholesale, Retail, Trade	455	637	1,092
Hotel and Restaurants	136	137	273
Transportation, Storage, Communication	14	28	42
Finance	5	11	16
Real Estate, Renting & Business	51	73	124
Education	14	24	38
Human Health & Social Work	16	24	40
Other Social & Personal Activities	64	118	182
Total	838	1,199	2,037

Source: AIM Policy Center.

To go into specific details, the two kinds of shocks were scrutinized separately. More than half of the respondents (68.34%) reported that the global financial crisis had “no impact” to “minimal impact” on their business. Of the firms that reported “moderate impact” to “very high

impact", the majority was on the micro and small scale in terms of firm size (see Table 3). The proportion of firms per size affected by the GFC is as follows: 30.92% of micro, 30.21% of small and 36.7% of medium. This suggested that the sample contained firms affected in some way by aggregate shocks despite their relative size differences.

Table 3. Effect of the Global Financial Crisis

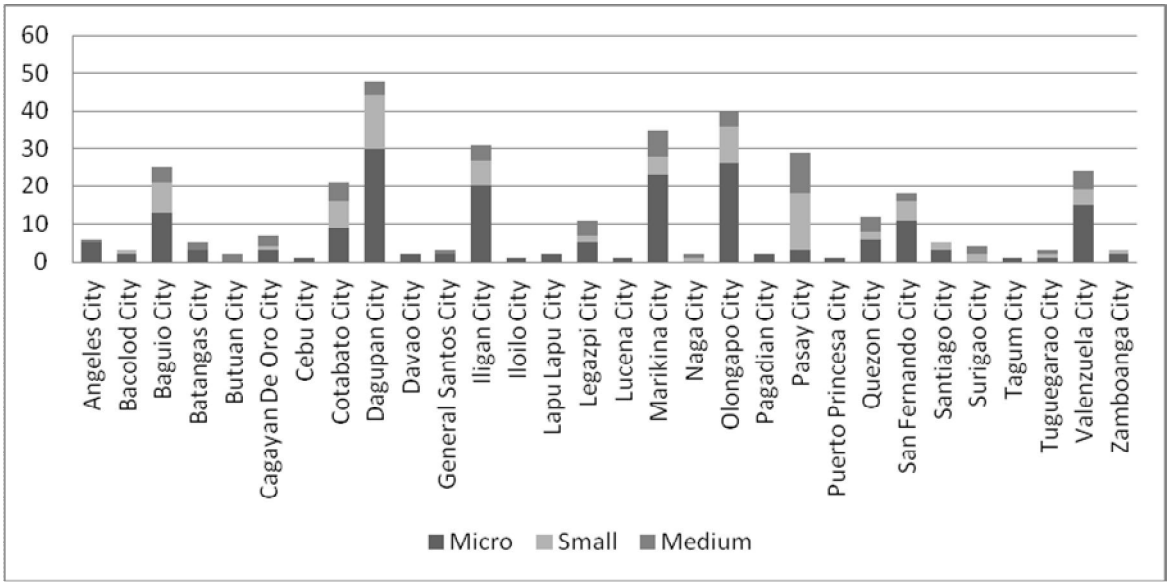
Firm Size	No Impact	Negligible Impact	Minimal Impact	Total of No to Minimal	Moderate Impact	High Impact	Very High Impact	Total of Moderate to Very High	Total Firms
Micro	602	46	145	793	132	191	32	355	1,148
Small	272	23	70	365	54	94	10	158	523
Medium	181	14	39	234	69	55	8	132	366
Total	1,055	83	254	1392	255	340	50	645	2,037

Source: AIM Policy Center.

The study also examined environmental shocks, measured by the number of respondents who answered that they were hit by any disaster or calamity. The calamities listed in the questionnaire include typhoon, flood, drought, earthquake, volcanic eruption, armed conflict, fire, and others. However, of the 348 respondents affected by any form of disaster or calamity, 297 (85.34%) said they were affected by typhoons, 288 (82.76%) were affected by floods, and only 24 (6.9%) answered that they were affected by other types of disasters listed.

The five cities that were most affected by calamities are Dagupan City, Iligan City, Marikina City, Olongapo City and Pasay City. In terms of firm size, 55.46% of those affect by calamities are micro, 25.29% are small, and 19.25% were medium (see Figure 2). However, since 30 micro firms were interviewed per city, as compared to the 15 small and 15 medium firms per city, it was more practical to combine the numbers of the small and medium firms or to examine the proportion per firm size. Only 154 out of the 348 firms (44.25%) that were affected by climate shocks had disaster preparedness kits in their workplace, suggesting a high degree of unpreparedness.

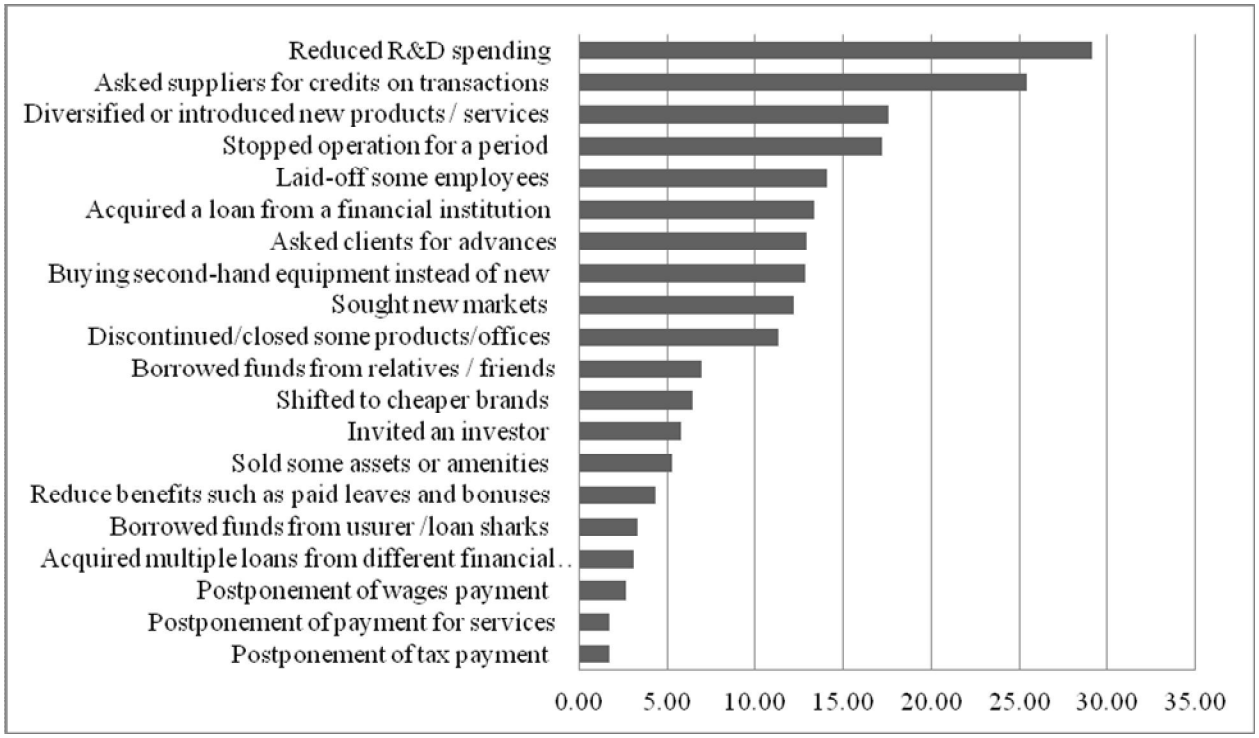
Figure 2. Firms Affected by Calamities by City and Size



Source: AIM Policy Center Enterprise Survey 2013.

As regards coping mechanisms, the most common were reducing R&D spending (29.11%), asking suppliers for credits on transaction (25.45%), diversifying or introducing new products or services (17.59%), stopping operations for a period (17.23%) and laying off employees (14.11%). Clearly, these coping mechanisms varied in their implications for over-all firm and community resilience (i.e. those that cut investments in future competitiveness could suffer more lasting consequences form the shock; and those that laid off workers could also contribute to the weaker resilience of communities since many would be unemployed). Other coping mechanisms with similar implications were also observed (Table 4).

Figure 3. Coping Mechanisms of Firms Affected by the Global Financial Crisis and Calamities (%)



Source: AIM Policy Center Enterprise Survey 2013.

The other coping mechanisms provided by the respondents included operations cost-cutting (electricity/ water/ telephone), marketing or promotions, and giving discounts to clients. For the 158 firms who laid-off employees to cope with the global financial crisis or calamities, as much as 22 firms (13.92%) reduced the number of their employees by half or more. Nevertheless, after adopting the adjustments, the majority of the firms were able to sustain daily operations (97.14%), but some still incurred serious losses in revenues (25.27%) and lost clients (18.57%). Furthermore, only 5 out of the 838 crisis affected firms reported receiving any formal assistance (such as from government or organizations other than friends or relatives).

Empirical Specification

The paper will use an analogous regression framework based on different household coping literature. For example, Loshkin (2004) who studied coping strategies of households in Russia

during a financial crisis uses the assumption that household utility is a continuous function of three factors: consumption of a composite good, leisure of its members, and household characteristics that act as taste shifters. To achieve maximum utility, a household has the choice to apply one or more strategy during shocks, where each strategy has its costs and benefits for the household. If the benefits of a certain strategy outweigh its costs, the household chooses to employ the strategy.

As Loshkin (2004) argues, assuming that the unobserved gain G_{ij} associated with the choice of strategy set *j* by household *i* can be approximated by a linear combination of the exogenous variables, the observed choice of the particular set of strategies can be presented as:

$$\left.\begin{array}{l} y_i^j = 1 \text{ if } G_{ij} > 0 \text{ or } X_i\beta_j + \varepsilon_{ji} > 0 \\ y_i^j = 0 \text{ if otherwise} \end{array}\right\} j = 1, 2, 3 \text{ and Corr } (\varepsilon_{ij}, \varepsilon_{ik}) \neq 0 \text{ for } \forall\, k, j$$

y_i^j = an indicator variable of the choice of the set of strategies j by household i

β_j = vector of unknown coefficients

X_i = vector of exogenous variables

ε_i = an error term

where y_i^j is an indicator variable of the choice of the set of strategies j by household i, β_j is a vector of unknown coefficients, X_i is a vector of exogenous variables, ε_i is an error term, 1 indicates the state with a strategy implemented, and 0 indicates the state where a strategy is not used.

In this paper, 20 binary probit equations are used with the 20 coping mechanisms as the dependent variable in each equation:

$$crisis\ coping = \alpha + \beta(firm\ and\ city\ characteristics) + \varepsilon$$

The independent variables include important factors that influence firm performance such as firm characteristics and characteristics of the city where the firm is located. The 20 coping mechanisms are also grouped into their possible implications on competitiveness or productivity of the firm. The summary of the variables used are presented in Table 4 below. The objective here is to create meaningful categories of coping so as to help reveal possible patterns that could be useful in interpreting over-all (and sustained) resilience of firms.

Table 4. Variables Used

Dependent Variables		
Coping mechanisms	Increases competitiveness	Invited an investor
		Diversified or introduced new products / services
		Sought new markets
	Neutral mechanisms	Acquired a loan from a financial institution
		Acquired multiple loans from different financial institution
		Borrowed funds from relatives / friends
		Borrowed funds from usurer /loan sharks
		Asked clients for advances
		Asked suppliers for credits on transactions
		Buying second-hand equipment instead of new
		Shifted to cheaper brands
		Sold some assets or amenities
	Decreases competitiveness	Reduced R&D spending
		Postponement of tax payment
		Postponement of payment for services
		Postponement of wages payment
		Laid-off some employees
		Reduce benefits such as paid leaves and bonuses
		Stopped operation for a period
		Discontinued/closed some products/offices
Explanatory variables		
Firm characteristics	log_bus_assetval	Natural log of present business asset value (Php) →basis for firm size
	corporation	Type of ownership: 1 if corporation; 0 if otherwise (single proprietorship/ partnership)
	bus_age_yr	business age in years
	log_productivity0	Natural log of (total sales in 2009/ total employees in 2009)

	collgrad_empl_prop	percentage of employees who finished at least a four year degree course
	resp_wexp_yr	Years of related work experience of respondent
	tot_amenities	Total amenities (computer, printer, telephone, TV, stove, etc.)
	export	Geographical markets served : 1 if international; 0 if local
	bus_insur	Has any type of insurance for business related purposes
City characteristics	infracty_goodnot	City's infrastructure rating: good vs. not good
	log_tot_cityincome	Natural log of total city income
	populationdensity	Population density per city
	higher_educinst	Number of higher education institution in the city
	tot_bank	Total number of banks in the city
	dynastym	Presence of dynasty in the mayor level

Source: AIM Policy Center.

IV. Analysis of Empirical Results

Using binary probit, the results are shown in Table 5 below. Table 6 is a summary of the results, showing only variables that are significant. A plus sign (+) signifies the direct relationship of the dependent variable (specific coping mechanism) and the independent variable, while a minus sign (-) signifies an inverse relationship. The coping mechanisms are also grouped where the three leftmost columns enclosed in a blue border are coping mechanisms that increase competitiveness, the middle group is composed of coping mechanisms that neither increase nor decrease competitiveness, and the ten rightmost columns enclosed in a red border are coping mechanisms that decrease competitiveness.

Table 5. Regression Results

	(1)	(2)	(3)	(4)	(5)
Variables	**Acquired loan from financial inst**	**Acquired multiple loans from financial inst**	**Borrowed from relatives and friends**	**Borrowed from usurers**	**Invited a new investor**
business asset value (log)	-0.006	0.073	-0.120*	-0.123*	0.103
	[0.060]	[0.054]	[0.073]	[0.071]	[0.067]
corporation	-0.229	0.353	-1.161***	0	-0.592*
	[0.313]	[0.454]	[0.389]	omitted	[0.347]
business age (years)	-0.004	0.000	-0.004	0.024***	-0.029**
	[0.006]	[0.006]	[0.011]	[0.009]	[0.013]
productivity in 2009 (log)	-0.030	-0.004	0.192*	-0.016	0.149**
	[0.032]	[0.030]	[0.100]	[0.050]	[0.066]
prop of employees who graduated college	-0.005*	-0.004	-0.010**	-0.001	0.007**
	[0.002]	[0.003]	[0.004]	[0.005]	[0.003]
work experience of respondent (years)	0.001	-0.007	0.019	0.030	0.028*
	[0.015]	[0.018]	[0.015]	[0.020]	[0.015]
total no. of amenities	0.004	-0.018	0.002	-0.103**	-0.007
	[0.004]	[0.012]	[0.004]	[0.052]	[0.007]
export	-0.109	-0.393	-0.177	0.073	0.337
	[0.322]	[0.390]	[0.398]	[0.439]	[0.507]
business insurance	-0.313*	-0.703**	-0.289	-0.501	0.017
	[0.187]	[0.303]	[0.290]	[0.321]	[0.264]
rating of city infrastructure: good or not good	-0.150	-0.033	-0.144	-0.043	-0.307
	[0.184]	[0.217]	[0.255]	[0.229]	[0.303]
total city income (log)	-0.452**	-0.339	-0.447*	-1.151***	-0.197
	[0.217]	[0.307]	[0.257]	[0.272]	[0.234]
population density	0.000	-0.000*	0.000**	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
no. of higher education	0.003	-0.019	0.066**	0.005	0.039

	(1)	(2)	(3)	(4)	(5)
Variables	**Acquired loan from financial inst**	**Acquired multiple loans from financial inst**	**Borrowed from relatives and friends**	**Borrowed from usurers**	**Invited a new investor**
institutions					
	[0.019]	[0.014]	[0.027]	[0.022]	[0.026]
no. of banks	0.001	0.005*	-0.007*	0.006*	-0.005
	[0.003]	[0.003]	[0.004]	[0.003]	[0.004]
dynasty (mayor level)	0.021	0.005	0.381*	0.402	0.822**
	[0.170]	[0.294]	[0.218]	[0.296]	[0.321]
Constant	9.093**	4.988	6.821	23.784***	-1.151
	[4.354]	[6.324]	[5.470]	[5.816]	[5.046]
Observation	859	859	859	667	859

Robust standard errors in brackets

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

	(6)	(7)	(8)	(9)	(10)
Variables	**Reduced R&D**	**Asked advance from clients**	**Asked credit from suppliers**	**Postponed tax payment**	**Postponed services payment**
business asset value (log)	0.092	0.091	0.142***	0.143**	0.061
	[0.056]	[0.056]	[0.049]	[0.058]	[0.085]
corporation	-0.568**	-0.304	-0.662**	-0.972**	-1.174*
	[0.249]	[0.327]	[0.327]	[0.466]	[0.614]
business age (years)	0.000	-0.013*	0.000	-0.016**	0.016*
	[0.007]	[0.007]	[0.007]	[0.006]	[0.009]
productivity in 2009 (log)	0.001	0.057*	0.072**	-0.038	-0.115***
	[0.028]	[0.034]	[0.036]	[0.028]	[0.043]
prop of employees who graduated college	0.003	0.003	-0.006***	-0.002	-0.013***
	[0.002]	[0.003]	[0.002]	[0.004]	[0.005]
work experience of	-0.002	0.015	-0.002	0.032	0.011

	(6)	(7)	(8)	(9)	(10)
Variables	**Reduced R&D**	**Asked advance from clients**	**Asked credit from suppliers**	**Postponed tax payment**	**Postponed services payment**
respondent (years)					
	[0.011]	[0.013]	[0.011]	[0.020]	[0.011]
total no. of amenities	0.004	-0.009	-0.007	-0.004	0.003
	[0.003]	[0.006]	[0.005]	[0.006]	[0.006]
export	0.303	0.904***	0.297	-1.110*	1.333***
	[0.343]	[0.344]	[0.314]	[0.593]	[0.464]
business insurance	0.051	0.202	0.228	-0.203	-0.258
	[0.200]	[0.238]	[0.212]	[0.353]	[0.439]
rating of city infrastructure: good or not good	-0.147	-0.077	-0.260	0.656**	-0.709***
	[0.184]	[0.226]	[0.183]	[0.320]	[0.265]
total city income (log)	0.295	0.063	0.428**	-0.170	-0.661*
	[0.196]	[0.228]	[0.210]	[0.329]	[0.348]
population density	0.000*	0.000	-0.000***	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
no. of higher education institutions	0.013	0.025	-0.029	-0.026	-0.069***
	[0.018]	[0.024]	[0.019]	[0.020]	[0.025]
no. of banks	-0.003	-0.005	0.003	0.002	0.012***
	[0.002]	[0.003]	[0.002]	[0.004]	[0.005]
dynasty (mayor level)	-0.029	0.304	-0.047	0.449	1.375***
	[0.163]	[0.220]	[0.174]	[0.343]	[0.433]
Constant	-8.374**	-4.718	-11.906***	-0.171	11.105
	[4.064]	[4.830]	[4.446]	[6.932]	[7.600]
Observation	859	859	859	859	859

Robust standard errors in brackets

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

	(11)	(12)	(13)	(14)	(15)
Variables	**Postponed wages**	**Bought second hand equipment**	**Laid-off employees**	**Reduced benefits of employees**	**Stopped operations**
business asset value (log)	0.086	0.007	0.072	-0.041	-0.178***
	[0.063]	[0.060]	[0.071]	[0.073]	[0.054]
corporation	-0.561	-0.160	-0.240	0.034	0.281
	[0.372]	[0.362]	[0.290]	[0.310]	[0.307]
business age (years)	0.006	-0.008	0.016***	-0.020**	-0.005
	[0.007]	[0.008]	[0.006]	[0.009]	[0.006]
productivity in 2009 (log)	-0.079**	0.001	0.013	0.107**	-0.013
	[0.036]	[0.035]	[0.031]	[0.048]	[0.029]
prop of employees who graduated college	-0.003	-0.006***	-0.004	-0.001	0.000
	[0.004]	[0.002]	[0.003]	[0.003]	[0.002]
work experience of respondent (years)	-0.003	-0.025*	0.005	-0.025	-0.011
	[0.010]	[0.015]	[0.013]	[0.017]	[0.013]
total no. of amenities	0.002	0.002	0.005*	0.001	0.007**
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
export	0.716*	0.417	-0.244	0.785**	-0.450
	[0.374]	[0.389]	[0.410]	[0.394]	[0.356]
business insurance	-0.529*	0.324	-0.459*	-0.168	0.132
	[0.299]	[0.241]	[0.265]	[0.316]	[0.230]
rating of city infrastructure: good or not good	-0.484**	-0.138	-0.202	0.376*	-0.474**
	[0.230]	[0.216]	[0.220]	[0.218]	[0.195]
total city income (log)	-0.352	0.187	0.646**	-0.095	-0.240
	[0.246]	[0.200]	[0.321]	[0.228]	[0.205]
population density	0.000	0.000	0.000	0.000	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
no. of higher education institutions	-0.041**	-0.021	0.074***	-0.020	0.034*
	[0.017]	[0.021]	[0.020]	[0.014]	[0.019]

	(11)	(12)	(13)	(14)	(15)
Variables	**Postponed wages**	**Bought second hand equipment**	**Laid-off employees**	**Reduced benefits of employees**	**Stopped operations**
no. of banks	0.007***	0.002	-0.011***	0.004*	-0.004
	[0.003]	[0.003]	[0.003]	[0.002]	[0.003]
dynasty (mayor level)	0.223	0.048	0.262	-0.765***	0.251
	[0.283]	[0.191]	[0.231]	[0.276]	[0.172]
Constant	5.390	-4.654	-16.630**	-0.016	6.149
	[5.189]	[4.212]	[6.724]	[4.845]	[4.194]
Observation	859	859	859	859	859

Robust standard errors in brackets

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

	(16)	(17)	(18)	(19)	(20)
Variables	**Discontinued product/ service**	**Shifted to cheaper brands**	**Sold assets/ amenities**	**Diversified products/ services**	**Sought new markets**
business asset value (log)	0.012	-0.095	0.105	-0.021	0.090*
	[0.055]	[0.079]	[0.095]	[0.048]	[0.054]
corporation	-0.521**	-0.604	-0.103	-0.282	-0.489*
	[0.241]	[0.369]	[0.410]	[0.244]	[0.270]
business age (years)	0.005	-0.014	-0.003	0.000	0.006
	[0.006]	[0.009]	[0.011]	[0.007]	[0.008]
productivity in 2009 (log)	-0.032	0.111	-0.056	0.005	0.068*
	[0.034]	[0.072]	[0.038]	[0.032]	[0.038]
prop of employees who graduated college	0.003	-0.006*	-0.001	0.002	-0.005*
	[0.003]	[0.003]	[0.004]	[0.003]	[0.003]
work experience of respondent (years)	-0.004	0.029**	0.048***	0.026*	0.023**
	[0.011]	[0.014]	[0.014]	[0.015]	[0.010]
total no. of amenities	0.001	0.009***	-0.056**	-0.009*	-0.017***

	(16)	(17)	(18)	(19)	(20)
Variables	**Discontinued product/ service**	**Shifted to cheaper brands**	**Sold assets/ amenities**	**Diversified products/ services**	**Sought new markets**
	[0.003]	[0.003]	[0.023]	[0.005]	[0.006]
export	-0.088	-0.631	-1.591***	0.655*	0.570
	[0.383]	[0.433]	[0.500]	[0.355]	[0.375]
business insurance	0.147	-0.157	0.258	0.222	0.580**
	[0.246]	[0.235]	[0.342]	[0.181]	[0.264]
rating of city infrastructure: good or not good	-0.389**	-0.108	0.436*	-0.206	-0.027
	[0.174]	[0.217]	[0.255]	[0.165]	[0.236]
total city income (log)	-0.649***	0.029	0.056	0.340	0.378
	[0.232]	[0.222]	[0.326]	[0.231]	[0.252]
population density	0.000**	0.000***	0.000	0.000**	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
no. of higher education institutions	-0.012	0.051**	0.035	-0.038**	-0.011
	[0.018]	[0.023]	[0.028]	[0.016]	[0.025]
no. of banks	0.002	-0.010***	-0.004	0.003	0.000
	[0.002]	[0.004]	[0.004]	[0.002]	[0.003]
dynasty (mayor level)	-0.281	-0.305	0.090	-0.536**	-0.553**
	[0.194]	[0.188]	[0.242]	[0.208]	[0.237]
Constant	12.577***	-2.107	-3.840	-7.573	-10.879**
	[4.603]	[4.590]	[6.889]	[4.684]	[5.206]
Observation	859	859	859	859	857

Robust standard errors in brackets

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

Table 6. Summary of Results

Variables	Invited a new investor	Diversified products…	Sought new markets	Loan from financial inst…	Multiple loans…	Borrowed from relatives…	Borrowed from usurers	Advance from clients	Credit from suppliers	Bought second hand	Shifted to cheaper	Sold assets…	Reduced R&D	Postponed tax payment	Postponed services payment	Postponed wages	Laid- off employees	Reduced benefits of employees	Stopped operations	Discontinued product…
business asset value (log)			(+)			(-)	(-)		(+)					(+)					(-)	
corporation	(-)		(-)			(-)			(-)				(-)	(-)	(-)					(-)
business age (years)	(-)						(+)	(-)						(-)	(+)		(+)	(-)		
productivity in 2009 (log)	(+)		(+)			(+)		(+)	(+)						(-)	(-)		(+)		
prop of employees – college graduate	(+)		(-)	(-)		(-)			(-)	(-)	(-)				(-)					
work experience of respondent (years)	(+)	(+)	(+)							(-)	(+)	(+)								
total no. of amenities		(-)	(-)				(-)				(+)	(-)					(+)		(+)	

Variables	Invited a new investor	Diversified products…	Sought new markets	Loan from financial inst…	Multiple loans…	Borrowed from relatives…	Borrowed from usurers	Advance from clients	Credit from suppliers	Bought second hand	Shifted to cheaper	Sold assets…	Reduced R&D	Postponed tax payment	Postponed services payment	Postponed wages	Laid- off employees	Reduced benefits of employees	Stopped operations	Discontinued product…
Export		(+)						(+)				(-)		(-)	(+)	(+)		(+)		
business insurance			(+)	(-)	(-)											(-)	(-)			
rating of city infra: good or not good												(+)		(+)	(-)	(-)		(+)	(-)	(-)
total city income (log)				(-)		(-)	(-)		(+)						(-)		(+)			(-)
population density		(+)			(-)	(+)			(-)		(+)		(+)						(+)	(+)
no. of higher educ institutions		(-)				(+)				(+)					(-)	(-)	(+)		(+)	
no. of banks					(+)	(-)	(+)								(+)	(+)	(-)	(+)		
dynasty (mayor level)	(+)	(-)	(-)			(+)									(+)			(-)		

With 20 different coping mechanisms, the results vary greatly. Some of the notable patterns suggest that firm characteristics considered to be "good" result in higher probability of choosing coping mechanisms that increase competitiveness and lower probability of choosing coping mechanisms that decrease competitiveness. One example is the business asset value variable, which shows that the bigger the firm size, the more likely the firm will choose to seek new markets as an adjustment response; and the less likely it will choose to stop operations. Another example is the productivity variable, where the results show that the higher the productivity of a firm in 2009 (i.e. pre-crisis), the higher the probability it will choose to invite a new investor and seek new markets, and the lower the probability that it will postpone payments to services and wages of employees. A third example is the variable related to the number of years of work experience related to the business of the respondent (the survey only interviews employees who are decision makers in the firm), where the results show that the more experienced the respondent is, the higher the probability that the firm will choose to use all three coping mechanisms that could be seen as contributing to competitiveness.

These findings suggest that the coping of firms could be bifurcated – larger and more productive firms are better able to cope, and might even see crises as opportunities for expansion and finding new markets. However, firms that are smaller and less productive may face additional challenges to survive, and they may turn to crisis coping mechanisms that have negative implications on their long run competitiveness. Nevertheless, these are very initial findings, given there is much noise in the dataset, and the patterns of coping are still far from definitive.

V. Directions for Policy and Research

In lieu of more definitive findings, we can only discuss directions for further inquiry and policy action here. Much of firms' crisis coping and adjustment is still little understood, notably as these interact with policy variables and available risk management tools. It is likely that policies could be vastly improved with more evidence on how to strengthen firm level competitiveness and resilience over time. Nevertheless, based on international experiences, the available literature, and our own initial findings, here is a first set of points to consider for policymakers:

1. **Resilience is key to competitiveness in the new policy environment.** Resilience can be measured by the typologies of the crisis coping mechanisms. The analysis can be similar

to resilience of households, where the choice of which strategy to adopt may depend on how they see the future (e.g. If they believe that the effect of the shock is short term, they may choose coping strategies such as delaying some forms of spending which could have very minimal and only temporary effects; as compared to strategies that may have more long-lived effects like selling their livestock or permanently pulling children out of school and sending them to work).

2. **Without broad based resilience, shocks can exacerbate inequality.** If shocks hit countries with greater frequency and severity, as predicted by scientists, then smaller and more informal firms will tend to be affected more adversely, based on this study and also on the existing international experiences. Once this becomes broadly known and is the norm, then informal and smaller firms may also opt for strategies that no longer enhance their productivity (such as by delaying or stopping investments that enhance productivity but are vulnerable to shocks). Markets may also marginalize them further, when these smaller firms are forced to choose more flood prone areas because they are cheaper.
3. **Stronger urban planning is necessary and it should not discriminate across firms**. For instance, in the city of Hanoi, planners located leisure areas like parks in more flood prone areas. The logic is that these areas will have very little impact on the economy if affected adversely by flooding. In the Philippines, the opposite is typically true, manufacturing firms and key residential and business districts are often near the river. Rivers are also sometimes over-run by informal settlers.
4. **Financing mechanisms to invest in resilience and innovative risk management mechanisms could be useful.** An example is the People's Survival Fund or Republic Act 10174 is a law that amended the Climate Change Act of 2009 by establishing the country's first legislated climate change funding mechanism. The fund is dedicated to supporting climate change adaptation and resilience-building programs of local governments and communities. A law, enacted in August 2012, stipulates the allocation and maintenance of at least P1 billion for the Fund every year, appropriated through the General Appropriations Act. As regards risk management, there are several possible approaches, including publicly provided or guaranteed mechanisms (such as those typically provided by central governments to local governments in industrialized countries), as well as privately provided options. As for the latter, an example is weather

derivatives like snow derivatives in the US. A typical arrangement here is that buyers and sellers of snow insurance will agree on a pre-specified trigger for pay out—usually a fixed number of inches of snowfall which could then be independently measured. If the accumulated snow is greater than the trigger, then the seller of the insurance product has to pay out. With thriving snow insurance markets, these types of contracts could vary in price depending on historical payouts and scientific evidence on possible precipitation. And since it is an index-based insurance, there is less information asymmetry thus less moral hazard because the trigger (flood or snow) cannot be controlled by any of the parties involved.[1]

[1] See for example: http://business.time.com/2012/01/24/no-snow-no-problem-how-wall-street-profits-from-weird-weather/#ixzz2XD21iEsb. Innovative financing and insurance mechanisms to manage risks of various types are now available in many countries. The interested reader may wish to turn to Kaul and Conceicao (2006) and Mendoza (2009b) for analyses in this area.

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