WORKING PAPER

Fear of Crime and Saving Behavior

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Abstract

Fear of crime, on top of being victimized by crime itself, is an important social concern because the literature suggests that it can affect behavior and decision-making. Some studies argue that negative emotions can induce present consumption; thus one behavior that crime can potentially influence is saving. Using a household survey dataset of 1,200 respondents, this paper tested for the influence of fear of crime on saving behavior. We found evidence that affective, or emotional, fear of crime has a negative effect on the likelihood of saving but has a positive effect on the likelihood of saving through formal channels. In contrast, cognitive fear, or the rational risk perception, of crime has an insignificant effect.

Keywords: fear; crime; saving; Heckman Probit model
I. Introduction and objectives

One of the primary goals of the current Philippine government is to rid the country of its problem on crime. This seems to have gained public support, with the President enjoying high popularity in recent public opinion polls. Chevigny (2003) argues that crime and fear of crime are usually used by politicians to attract support because it appeals to all social classes; and this is more pronounced in areas where inequality is high and delivery of social services is poor. While crime itself is a crucial concern, fear of crime is also an important social issue because it can alter behavior, decision-making, mobility, and thought patterns (Doran and Burgess 2012; Jackson and Gray 2010; De Mello and Zilberman 2008; Bennett 1991; Moore and Trojanowicz 1988; Clotfelter 1977).

With the current clamor of Filipinos for a safer country, one would ask how valuable safety and security is for them and how fear of crime can affect decision making in their daily lives. One behavior that can reflect the effect of fear on decision making is the inter-temporal allocation of consumption, which is captured by the choice whether and how to save part of one’s income. This paper investigates how fear of crime influences saving decisions using data from a household survey conducted in Metro Manila. The primary objective of this paper is to study the relationship between fear of crime and saving behavior. Specifically, it attempts to study two relationships. First is the effect of fear of crime on whether the individual saves part of his/her income or not. The second is the effect of fear of crime on whether the individual uses formal or informal means of saving.

This paper is organized as follows. This brief introduction is followed by a review of relevant literature. Next, a theoretical framework based on saving theory and on how fear can influence saving and consumption decisions is discussed. This is followed by the econometric model used, and a presentation and discussion of the regression results. A short summary concludes the paper.

II. Review of related literature

II.A. Motives and determinants of saving

Individual households have different motives to save their income. One can look at savings as a way for households to smoothen consumption: as an individual would not necessarily consume one’s income completely for one period, but rather look at
the accumulation of income, known as wealth. Wealth is then consumed to maximize utility. One may not receive and spend all his/her lifetime income in one time period; hence we take into account different possibilities to expand wealth through lending and borrowing.

Looking at savings from a microeconomic perspective, it is essentially an expansion of future income (or total wealth): enabling the consumption of more goods and services in the future. The work of Fisher (1930) characterized an individual’s inter-temporal consumption, savings, and investment decisions under certainty; while the work of Markowitz (1952) integrated uncertainty, serving as a clear treatment of the individual’s decision problem today, building what is known in modern-day theory of finance (Martin, Cox and Macminn 1987). Uncertainty is important in this paper because fear of crime can be thought of as a source of uncertainty about the future.

One of the main questions regarding saving is why people save. In the microeconomic literature, it is well-known that individuals prefer present to future consumption, giving rise to the concept of discount rate. Thus, for consumers to save, they should have motives that outweigh this preference for present consumption. In a comprehensive review of saving literature, Browning and Lusardi (1996) identified nine motives of saving – eight from Keynes’ (1936) pioneering book on macroeconomics plus an additional motive. These are: precautionary motive, life-cycle motive, inter-temporal substitution motive, bequest motive, improvement motive, independence motive, enterprise motive, avarice motive, and downpayment motive.

Precautionary motive is saving for emergencies and uncertainty of future income; life-cycle motive is saving for future consumption and for anticipated future needs of the household; inter-temporal substitution motive is the intention to save and invest in the future when more attractive returns arise; and bequest motive is saving for the next generation. Improvement motive is for gradual increase in spending; independence motive is to enjoy independence and the ability to do things; enterprise motive is saving for business and entrepreneurial purposes; avarice motive is for purchase of goods beyond one’s needs; and downpayment motive is for payment of, as the name denotes, initial deposits when purchasing durable goods such as houses and cars.

These motives were tackled separately by different authors, with life-cycle and precautionary motives being the most popular. The life-cycle theory of consumption
and saving, usually attributed to Modigliani, Brumberg, and Ando (Modigliani and Ando 1957; Ando and Modigliani 1963; Modigliani and Brumberg 1954), supports the life cycle motive. It has dominated the literature from around 1950s to the early 1980s, and major works about it were reproduced in Modigliani (2005). Criticisms of the model eventually forced researchers to re-think the life cycle hypothesis (Baranzini 2005). Later works studied the precautionary motive, its relationships with other variables, and its applications. These include precautionary motive in relation to consumption fluctuations (Parker and Preston 2005), how it relates to other risks (Courbage and Rey 2007), its relation to consumption smoothing, risk aversion, and inter-temporal substitution (Kimball and Weil 2009), and even in explaining how incomplete markets affect wealth accumulation and consumption (Gourinchas and Parker 2001).

In more recent years, other motives for saving emerged such as the downpayment motive discussed earlier (Browning and Lusardi 1996); and the competitive saving motive (Wei and Zhang 2011; Du and Wei 2013), used to explain the extremely high savings rate in China. According to these papers, the high male-to-female ratio prompts Chinese parents to save and invest in their child to make them more attractive and competitive in the marriage market.

Related to the question of what motivates saving is the question of what the determinants of savings are. This is important to this study because we want to know what variables to control for in isolating the effect of fear of crime on saving. In general, the literature provides two sets of determinants of household saving – household level variables and macro-level indicators – and the papers studying the latter appear to outnumber the former. Using a panel data set of countries worldwide, and what the authors described as the largest aggregate saving data set assembled, Loayza et al (2000a) concluded that level and growth rate of per capita income, dependency ratio, inflation, public saving, and financial liberalization are the significant determinants of aggregate private saving. Moreover, the authors discussed that the significance of old and young dependency ratio is consistent with the life-cycle hypothesis, while the significance of inflation is consistent with the precautionary motive. Other studies that used large panel data of countries to study the factors that affect saving include Edwards (1996), Bailliu and Reisen (1998), Haque, Pesaran, and Sharma (1999), Corbo and Schmidt-Hebbel (1991), and Dayal-Ghulati and Thimann (1997). Loayza et al (2000a) summarized the results of these studies. The notable determinants of savings found by some of these papers include income level and growth rate; population dependency rate; pension transfers to old
population; government surplus, savings, and expenditure; interest rate; and inflation.

Other cross-country studies used smaller sample size but had similar conclusions. Callen and Thimann (1997) used a twenty-year panel data from OECD countries to study the macroeconomic determinants of household saving and concluded that public and corporate saving, economic growth, taxes, government transfers, and country demographic characteristics are the most robust determinants of household saving, while inflation, unemployment, and interest rate less so. A related study by Niculescu-Aron and Mihaescu (2012) of European Union countries found evidence that inflation, interest rate, and percentage of urban population have positive relationship with savings rate, but demographic dependency ratio has an insignificant effect. In contrast to most other similar papers, the authors also found evidence of a negative relationship between economic growth and saving rate. However, these relationships change when Western European countries and Central and Eastern European nations were analyzed separately. This could mean that savings have different determinants between developed and developing economies.

The factors that determine saving in developing countries is the subject of a number of studies. Loayza et al (2000b) did a comprehensive review of such papers and identified income, economic growth, dependency rate, and uncertainty as the factors that affect saving. Moreover, income has a greater effect on savings for developing countries than for developed nations. Using a panel data of 10 developing countries, Schmidt-Hebbel et al (1992) identified income and wealth as the variables that positively determine savings, while foreign assets and monetary assets have negative effect. This highlights the importance of liquidity constraints on saving in developing countries. Similarly, Horioka and Terada-Hagiwara (2011) studied developing Asian countries and found evidence that dependency ratio, income, and financial sector development are the macro-level determinants of savings.

Using Southeast Asian and Latin American countries, Dayal-Gulati and Thimann (1997) studied policy and non-policy determinants of savings. The authors found evidence that fiscal policy affects private saving – government budget surplus has a negative effect while government social security expenditures and private contribution to pension fund increase savings. Moreover, the authors also concluded that financial development is a positive determinant of savings, while dependency rate and macroeconomic stability, as measured by inflation variability, decreases savings. In a similar study but involving only Latin American countries, Edwards
(1996) concluded that private saving is determined by demographic factors, social security expenditures, financial sector development, economic growth, and foreign savings. Corbo and Schmidt-Hebbel (1991), Haque et al (1999), and Bailliu and Reisen (1998) are other studies concluding that public policy and institutions can help affect private saving. However, as argued by Beverly and Sherraden (1999), poor households are less likely to have access to these institutions. This could imply that the effect of public policies and institutions on saving could be more tempered in developing countries.

In addition to studies on savings using multiple developing countries, there are also literature on factors that affect savings using Philippine data, and most of these focus on household-level variables. Orbeta (2005) found evidence of a negative effect of number of children on household savings using household survey data. This supports the results of studies discussed earlier that dependency rate negatively affects savings. Using a different household survey, Mapa and Bersales (2008) had similar results on the effect of young dependents on savings rate. Bersales and Mapa (2006) did a more comprehensive analysis of household-level correlates of savings using a panel data of households. The variables that turned out significant are income, education, young and old age dependents, and income from abroad.

II.B. Fear and fear of crime

The study of emotions has become a prominent field in psychology, with works from Tomkins (1962) and Smith and Lazarus (1990) discussing that emotional experiences could affect intuition; and that base emotions such as happiness, anger, and fear are the product of transactions or relationships between the person and the environment, and fundamentally different from each other. Integrating decision making given different emotional states, Lerner and Keltner (2000, 2001) introduced the Appraisal Tendency Framework (ATF), which serves as a basis for predicting the influence of specific emotions on consumer decision making. This provided a form of nuanced emotion-specific approach in discussing results of decision making processes. As noted by the ATF, emotions of the same valence (for instance fear and anger) can have different effects on judgement and choice, while emotions with different valence such as anger and happiness can have the same effects.

Despite government efforts to decrease crime rates, reducing the fear of it is not as easy (DuBow, McCabe, and Kaplan, 1979), which suggests that once fear of crime is instilled, it may take more than anti-crime measures to allay public concern and
reactions (Taylor and Hale, 1986). In order to understand the root of fear of crime, we look at its determinants. As early studies suggest, the fear of crime can be expressed as a function of physical and social vulnerability (Evans and Fletcher 2000; Taylor and Hale 1986; Skogan and Maxfield 1981). The former can be found in openness to attack, ability to resist, and exposure to emotional and physical effects of becoming a victim of crime, while the later would refer to the level of exposure to victims of crime and the ability to cope with the consequences of becoming a victim of crime (Skogan and Maxfield, 1981). Both physical and social vulnerabilities are attributable to traits, behavior, and environment of the individual (Schafer, Huebner, Bynum, 2006).

There is a rich body of literature on what other factors affect or determine fear of crime. Physical and social vulnerability (Evans and Fletcher 2000; Taylor and Hale 1986; Skogan and Maxfield 1981), gender (Collins 2016; Valera and Guàrdia 2014; Skogan and Maxfield 1981), old age (Valera and Guàrdia 2014; Rader, Cossman, and Porter 2012; Skogan and Maxfield 1981), income (Rader, Cossman, and Porter 2012; Meško et al. 2008; Warr and Ellison 2000; Skogan and Maxfield 1981), education (Hummelsheim et al. 2011; Dammert and Malone 2003), past victimization of crime (Valera and Guàrdia 2014; Dammert and Malone 2003; Skogan and Maxfield 1981; Balkin 1979), and neighborhood characteristics (Foster, Giles-Corti, and Knuiman 2010) are just some of the factors that affect fear of crime in the literature.

The fear of crime, on top of being victimized by crime, is a concern in itself because it can adversely affect the public. Fear can change behavioral and thought patterns, limits mobility, and affects decision making because of worries about protecting one’s self (Doran and Burgess 2012; Jackson and Gray 2010; De Mello and Zilberman 2008; Bennett 1991; Moore and Trojanowicz 1988; Clotfelter 1977). Fear can also affect other aspects of society. It can increase support for authoritarianism and punitive policies (Klama and Egan 2011; Wanner and Caputo 1987; Taylor, Scheppele, and Stinchcombe 1979; Sales 1973), affect culture (Warr 2000), and induce out migration from urban areas (Cullen and Levitt 1999; Miethe 1995; Skogan 1986). Other societal effects of fear of crime include promoting urban violence and neighborhood decline (Cullen and Levitt 1999; Miethe 1995; Skogan 1986) and debilitating development and diversification of local economies (Rios 2015; Carboni and Detotto 2013).
III. Theoretical framework

III.A. Framework in analyzing fear and consumption

Loewenstein (1996) presented a framework on how to analyze the effect of visceral factors such as fear on human behavior, including inter-temporal allocation of consumption. The framework starts with a utility function where utility is expressed as a function of consumption and visceral factors in different time periods (Equation 1).

\[ U = \sum_t u(x_{t1}, ..., x_{tn}, a_{t1}, ..., a_{tm}, t) \]  

(1)

In equation (1), \( U \) is the total utility from consumption and visceral factors across different time periods, \( (x_{t1}, ..., x_{tn}) \) is the consumption vector of goods 1 to n at time \( t \), \( (a_{t1}, ..., a_{tm}) \) is the vector of visceral factors 1 to m at time \( t \), and \( t \) is time. Equation (1) can be modified such that visceral factors can be grouped into subsets that affect only one consumption good. A simple case of this modification can be shown using Equation (2), where each consumption good at time \( t \), \( x_{t1} \), is affected by at most one visceral factor at time \( t \), \( a_{t1} \).

\[ U = \sum_t u(v_1(x_{t1}, a_{t1}, t), ..., v_n(x_{tn}, a_{tn}, t)) \]  

(2)

In Equation (2), \( v_j(x_{t1}, a_{t1}, t) \) is the utility from consuming consumption good \( x_j \) at time \( t \) given a level of visceral factor \( a_{t1} \) at time \( t \). Loewenstein (1996) stated several propositions and used Equations (1) and (2) to express them mathematically. These propositions are, according to the author, supported by literature. They were not supported by proofs, but were only stated in words and in mathematical notation.

One of these propositions is that increasing the level of a visceral factor increases the individual’s valuation of consumption of goods today relative to consumption tomorrow. Using the notations in Equation (2), given two different levels of visceral factor, \( a \) and \( a' \) and two levels of consumption good, \( x \) and \( x' \); if \( a' > a \) and \( v(x, a, 0) = v(x', a, t) \), then \( v(x, a, 0) > v(x', a', t) \).

This proposition was supported by Kapoor (2008), who argued that negative emotion can indeed induce present consumption. Similarly, Loewenstein (2000) explained that the utility from consumption at present mitigates visceral factors and thus the marginal rate of substitution for delayed consumption increases.
Prelec and Loewenstein (1998) also maintain that emotions have an important role in saving behavior.

### III.B. Inter-temporal allocation of resources

The savings decision strategy of an individual allows for consumption smoothing, which in its core permits an individual to behave without much difference across time given the uncertain environment that he/she lives in. Hence, in the literature of financial economics, we identify consumption opportunities that are as smooth as possible given different situations that may arise in the future (Martin, Cox and Macminn 1987).

Under certainty, the Fisher Model (1930) describes inter-temporal choice as the allocation of resources between consumption and savings. Provided with a two-period perfect capital market, a typical consumer is faced with two choices – to consume today \( C_0 \) or tomorrow \( C_1 \). \( C_0 \) and \( C_1 \) are a sequence of time dated consumption called the consumption stream. Alongside basic consumer preference assumptions such as the ability to choose different consumption streams, transitivity, non-satiation, and the convexity of preferences, the inter-temporal budget constraint is as follows:

\[
C_1 = (1+r_s)Y_0 + Y_1 \cdot (1+r_b)C_0 = (1+r_b)Y_0 + Y_1 \cdot (1+r_b)C_0
\]  

Equation (3) depicts the relationship between present and future consumption, \( C_0 \) and \( C_1 \), and inter-temporal income, denoted by \( Y_0 \) and \( Y_1 \). Provided with parameters such as interest rate for borrowing and lending (denoted by \( r_b \) and \( r_s \) respectively), future consumption is simply an autoregressive function of itself. If \( r_b > r_s \) (since banks would have to cover administrative costs and the risk premium at the event of default), then for different lending and borrowing rates, the inter-temporal budget constraint’s slope would differ. Of course, if an individual chooses not to borrow or lend money, we revert back to the static individual consumption, treating \( C_1 = Y_1 \) and \( C_0 = Y_0 \) under the assumption of fully consuming income per period in order to maximize utility.
IV. Methodology

IV.A. Data and Data Source

The dataset used in this paper is borne out of a multi-stage random survey among 1,200 households in Metro Manila. The sample size per city is proportionally distributed based on the population size of each of the 17 component cities and municipality of Metro Manila. Sampled barangays were randomly drawn from each congressional district, and respondent households were drawn using systematic random sampling from each barangay. Starting from pre-determined points based on road maps of sample barangays, enumerators counted-off to the 10th house and attempted to conduct an interview. If the 10th household declined to participate, the enumerator proceeded to the next house. After each successful interview, the surveyor counted-off to the 10th house thereafter, conducted the next interview, and so on, until the target number of households to be interviewed in the barangay is met. The interviews were conducted in Filipino, the language that 96 percent of the respondents speak at home.

The survey instrument consists of questions regarding victimization and fear of crime, perceptions of authority, insecurities, political views and behavior, media consumption, and socio-demographic indicators. The instrument includes several fear of crime questions, as recommended by Collins (2016). Specific crimes were adopted from the Social Weather Stations (2016) and the Neighborhood Watch Crime Perception Survey of the Sanford, North Carolina Police Department (2007). The community problem questions were patterned after the 2012-13 Crime Survey for England and Wales, and other insecurity questions from Dammert and Malone (2003). Illegal drug-related items were adopted from several instruments of the European Monitoring Centre for Drugs and Drug Addiction. The instrument was pre-tested in two barangays.

IV.B. Empirical Strategy and Methodology

Two types of fear of crime were tested for their effect on saving behavior: cognitive fear and affective fear. According to Ferraro and Grange (1987), cognitive fear is associated with the perceived risk or likelihood of victimization, while affective fear is an emotional response to the pain or loss from the crime. Cognitive fear appeals to emotion while affective fear appeals to rationality or objective risk perception. Rountree and Land (1996) showed that affective fear and cognitive fear are affected
by different factors. For instance, women have higher cognitive fear but affective fear has no significant difference between the sexes. In addition, income negatively affects cognitive fear but has no effect on affective fear.

In the survey, the affective fear of crime is captured by the questions “I feel safe from crime in this neighborhood” and “I feel safe from crime in Metro Manila”, with the following possible answers: “Strongly Agree”, “Agree”, “Neutral”, “Disagree”, and “Strongly Disagree”. In this paper, cognitive fear is measured through an index constructed using the methodology of Garcia et al (2017) utilizing the same survey data. It is derived from survey questions asking respondents how likely they think they will be victimized by five different crimes: pick pocketing and robbery, burglary, vehicle theft, rape or attempted rape, and physical violence other than rape. We used a Likert rating scale of fear of future victimization for the five crimes. The rating scale (Likert 1932: similar to Britto 2013; Dammert and Malone 2003, 2006) was from the question: “How likely are you to become a victim of [specific crime] in the next 12 months?”, with the following possible answers: very likely, somewhat likely, somewhat unlikely, very unlikely, and don’t know.

Survey results show that there is high correlation among the fear of future victimization for individual crimes. To address this, the index was constructed such that it is equal to the average of the responses to the five questions, where very likely = 5, somewhat likely = 4, don’t know = 3, somewhat unlikely = 2, and very unlikely = 1. The scale captured an underlying general fear of future victimization, while accounting for the differences in the perceived likelihood of falling victim to specific crimes. Warr and Stafford (1983) studied the inherent causes of fear of victimization for a variety of specific violent and property crimes. They asserted that fear of victimization is a function of the interaction between the perceived seriousness of a crime and the perceived risk of falling victim to that crime. As such, they found fear of violent crimes such as murder, which is very serious but unlikely to occur, to be far lower than fear of property crimes like residential burglary, which could be both serious and likely to occur. Our use of the index based on average response across five crimes accounted for the intensity of perceived risk. It did not use a binary dependent variable or a single Likert-item when it is possible to combine several items into a scale that represents the latent construct (Collins, 2016; Lim and Chun, 2015; Shippee, 2012). Cronbach’s Alpha is a scale reliability coefficient defined as the square of the correlation between a scale and the underlying factor it aims to measure (Cronbach, 1951). Computations by Garcia et al (2017) show that Cronbach’s Alpha for this cognitive fear of crime index is sufficiently high at 0.90 and factor analysis is satisfactory.
The survey also asked the respondents if they are able to save some of their income, along with where they keep these savings. The choices are “store money at home”, “deposit money in a bank”, “contribute to a cooperative or pooled fund”, and “others”.

This paper tests for the effect of fear of crime on two aspects of saving: the likelihood of saving and the likelihood of saving through formal means. Logit regression was used for the first objective while Heckman Probit Sample Selection Model, based on Heckman (1979) but with binary outcome dependent variable, was used for the second. The Heckman Probit model was used because data on saving through formal means is only available for respondents who actually save. Thus, data is censored on those who do not save. That is, there is a sample selection bias because data on where savings are placed is available only for those with savings.

We used cognitive and affective measures of fear of crime in separate regressions. In addition, we used two measures of affective fear of crime: the respondent’s affective fear of crime in his/her own neighborhood, and affective fear of crime in Metro Manila as a whole. We included the affective fear of crime in Metro Manila because most residents of the region do not just stay in their neighborhood. They study, work, or visit other areas or other cities within the metropolis, and thus their affective fear of crime in Metro Manila may affect their decisions. Thus, these models were estimated:

\[
\text{saving} = a + \beta \text{fearcog} + \delta X + \mu \quad (4)
\]
\[
\text{saving} = \tau + \pi \text{fearaff} + \rho X + \nu \quad (5)
\]
\[
\text{formal} = \zeta + \theta \text{fearcog} + \zeta Z + \eta \quad (6)
\]
\[
\text{formal} = \phi + \lambda \text{fearaff} + \omega Z + \varepsilon \quad (7)
\]

where \text{saving} is a dummy variable =1 if the respondent has savings, \text{formal} is a dummy variable =1 if the respondent saves through formal means (“bank” in the question asking where do respondents place their savings), \text{fearcog} is the index measuring cognitive fear of crime that was described earlier, \text{fearaff} is the variable measuring affective fear of crime, and \beta, \pi, \theta, \lambda, are their coefficients, X and Z are vectors of control variables and \beta, \pi, \theta, and \lambda, are their coefficients, and \alpha, \tau, \zeta, and \phi are constants. The variables are \mu, \nu, \eta, and \varepsilon are error terms.

Equations (4) and (5) were estimated using logit regression while equations (6) and (7) used Heckman Probit regression. For the Heckman regressions, equations (6)
and (7) are the outcome equations. The selection equation used the variable saving as the dependent variable and the independent variables are those used in Equations (4) and (5). As a requirement for efficient estimates, some variables in $X$ are not in $Z$. To check for robustness of results, all four models were run using different sets of control variables. Note that Equations (5) and (7) used affective fear of crime in Metro Manila and in the neighborhood in separate regressions.

The control variables included were socio-demographic indicators including age, sex, educational attainment, income, employment status, and marital status. Also included were neighborhood characteristics that were derived from the survey, including an index of perceived neighborhood problems identified by the respondents and an indicator of being victimized by crime. Also included are number of hours of exposure to different media per day and respondent’s perception of whether he/she is relatively richer or poorer than his/her neighbors. The variables used and their summary statistics are detailed in Table 1. A quick look at Table 1 shows that almost half (44 percent) of survey respondents save some parts of their income. Among those who save, 61 percent keep their savings through formal means (banks).

| Variable Name   | Description                                                                 | Mean  | SD   | Min | Max |
|-----------------|-----------------------------------------------------------------------------|-------|------|-----|-----|
| savings         | Dummy =1 if respondent saves part of his/her income                         | 0.438 | 0.496| 0   | 1   |
| formal          | Dummy =1 if respondent keeps savings in formal channels (banks)              | 0.605 | 0.489| 0   | 1   |
| fearcog         | Cognitive fear index                                                        | 2.372 | 0.950| 1   | 5   |
| fearaff_neigh   | Answer to the question: “I feel safe from crime in this neighborhood”. =1 if Strongly agree; =2 if Agree; =3 if Neutral; =4 if Disagree; =5 if Strongly disagree. | 2.321 | 0.847| 1   | 5   |
| fearaff_mm      | Answer to the question: “I feel safe from crime in Metro Manila”. =1 if Strongly agree; =2 if Agree; =3 if Neutral; =4 if Disagree; =5 if Strongly disagree. | 2.891 | 0.879| 1   | 5   |
| age             | Age of respondent                                                           | 48.122| 14.326| 19 | 85 |
| sex             | =1 if female                                                                | 0.679 | 0.467| 0   | 1   |
| educ1*          | =1 if respondent has some elementary education or lower                      | 0.030 | 0.171| 0   | 1   |
| educ2           | =1 if respondent reached high school                                         | 0.153 | 0.360| 0   | 1   |
| educ3           | =1 if respondent is a high school graduate                                  | 0.293 | 0.455| 0   | 1   |
| educ4           | =1 if respondent has vocational degree or reached college                    | 0.277 | 0.448| 0   | 1   |
| educ5           | =1 if respondent is a college graduate                                      | 0.248 | 0.432| 0   | 1   |
| inc1            | =1 if low income level (PhP 0 to 15,000 per month)                          | 0.426 | 0.495| 0   | 1   |
| inc2            | =1 if medium income level (PhP15,001 to 80,000 per)                         | 0.530 | 0.499| 0   | 1   |
V. Results and Discussions

V.A. Regression results

The average marginal effects after Logit of the runs involving cognitive fear and affective fear are reported in Table 2 and Table 3. These tables show that the coefficients of both cognitive and affective fear are negative but only some are significant. Cognitive fear is significant in only one of the three sub-models, and only at 10% level. Affective fear of crime in the respondent’s own neighborhood turned no significant effect at all. The fear variable that appears to have the strongest effect on likelihood of saving is affective fear of crime in Metro Manila. Respondents who do not feel safe in Metro Manila as a whole are less likely to save.

These results show some evidence that fear of crime negatively affects the likelihood that a person will save. That is, people who are more afraid are less likely to save. This effect is captured most strongly by affective fear and less so by cognitive fear. This is shown by the affective fear variables being significant in more runs and having higher marginal effects than the cognitive fear. The results also show that the effect is captured by affective fear of crime in Metro Manila as a whole rather than affective fear of crime in the person’s own neighborhood.
Other than the variables of interest, the sign of the coefficients of most control variables were not unexpected. Age has negative and significant coefficient while age squared is positive and significant. This means that older people are more likely to save but at a certain age, this effect reverses. Respondents who are employed and those with higher educational attainment and income also have higher probability of saving. In addition, individuals who think that they are relatively richer than their neighbours are more likely to save; and those relatively poorer are less likely to do so. Exposure to media also has positive effect on the probability of saving.

| Variable     | Coefficient 1 | Coefficient 2 | Coefficient 3 | Standard Error 1 | Standard Error 2 | Standard Error 3 |
|--------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|
| fearcog      | -0.018        | -0.026        | -0.022        | (0.014)         | (0.014)         | (0.014)         |
| age          | -0.021        | -0.020        | -0.017        | (0.006)***      | (0.006)***      | (0.006)***      |
| age squared  | 0.000         | 0.000         | 0.000         | (0.000)***      | (0.000)***      | (0.000)***      |
| sex          | -0.030        | -0.035        | -0.028        | (0.030)         | (0.030)         | (0.030)         |
| educ2        | 0.016         | 0.013         | 0.022         | (0.085)         | (0.084)         | (0.081)         |
| educ3        | 0.044         | 0.040         | 0.035         | (0.081)         | (0.080)         | (0.077)         |
| educ4        | 0.140         | 0.136         | 0.113         | (0.081)*        | (0.080)*        | (0.078)         |
| educ5        | 0.179         | 0.173         | 0.143         | (0.082)**       | (0.081)**       | (0.078)*        |
| inc2         | 0.210         | 0.209         | 0.171         | (0.025)***      | (0.026)***      | (0.026)***      |
| inc3         | 0.650         | 0.646         | 0.555         | (0.108)***      | (0.108)***      | (0.107)***      |
| employed     | 0.110         | 0.108         | 0.104         | (0.028)***      | (0.028)***      | (0.028)***      |
| separate     | -0.025        | -0.026        | -0.019        | (0.041)         | (0.041)         | (0.040)         |
| single       | 0.076         | 0.075         | 0.073         | (0.045)*        | (0.046)         | (0.046)         |
| victim       | 0.042         | 0.033         |              | (0.027)         | (0.027)         |                |
| neighprob    | 0.023         | 0.020         |              | (0.019)         | (0.019)         |                |
| richer       |               |               | 0.198         |                 |                 |                |
Table 3. Average marginal effects after logit (Variable of interest: Affective fear).

| Variable          | Marginal Effect 1 | Marginal Effect 2 | Marginal Effect 3 | Marginal Effect 4 | Marginal Effect 5 |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| fearaff_neigh     | -0.009            | -0.016            | -0.012            |                   |                   |
|                   | (0.015)           | (0.016)           | (0.016)           |                   |                   |
| fearaff_mm        |                   |                   |                   | -0.031            | -0.035            | -0.038            |
|                   |                   |                   |                   | (0.015)**         | (0.015)**         | (0.015)**         |
| age               | -0.021            | -0.020            | -0.017            | -0.021            | -0.020            | -0.017            |
|                   | (0.006)**         | (0.006)**         | (0.006)**         | (0.006)**         | (0.006)**         | (0.006)**         |
| age squared       | 0.000             | 0.000             | 0.000             | 0.000             | 0.000             | 0.000             |
|                   | (0.000)**         | (0.000)**         | (0.000)**         | (0.000)**         | (0.000)**         | (0.000)**         |
| sex               | -0.027            | -0.030            | -0.024            | -0.026            | -0.030            | -0.024            |
|                   | (0.030)           | (0.030)           | (0.030)           | (0.030)           | (0.030)           | (0.030)           |
| educ2             | 0.013             | 0.011             | 0.018             | 0.022             | 0.019             | 0.028             |
|                   | (0.085)           | (0.084)           | (0.081)           | (0.086)           | (0.085)           | (0.082)           |
| educ3             | 0.042             | 0.039             | 0.032             | 0.052             | 0.049             | 0.045             |
|                   | (0.080)           | (0.080)           | (0.077)           | (0.081)           | (0.081)           | (0.078)           |
| educ4             | 0.135             | 0.131             | 0.107             | 0.148             | 0.143             | 0.121             |
|                   | (0.081)*          | (0.080)           | (0.077)           | (0.082)*          | (0.081)*          | (0.079)           |
| educ5             | 0.173             | 0.166             | 0.136             | 0.189             | 0.184             | 0.155             |
|                   | (0.082)**         | (0.081)**         | (0.078)*          | (0.083)**         | (0.082)**         | (0.080)*          |
| inc2              | 0.209             | 0.207             | 0.170             | 0.207             | 0.206             | 0.167             |
|                   | (0.026)**         | (0.026)**         | (0.026)***        | (0.026)**         | (0.026)***        | (0.026)***        |
| inc3              | 0.653             | 0.650             | 0.558             | 0.652             | 0.651             | 0.556             |
|                   | (0.108)**         | (0.107)**         | (0.106)***        | (0.107)**         | (0.107)**         | (0.106)***        |
| employed          | 0.112             | 0.111             | 0.106             | 0.112             | 0.110             | 0.105             |
|                   | (0.028)**         | (0.028)**         | (0.028)***        | (0.028)**         | (0.028)***        | (0.028)***        |
| separate          | -0.025            | -0.026            | -0.019            | -0.026            | -0.027            | -0.021            |
|                   | (0.041)           | (0.041)           | (0.040)           | (0.041)           | (0.041)           | (0.040)           |
| single            | 0.076             | 0.075             | 0.073             | 0.075             | 0.075             | 0.073             |
|                   | (0.045)*          | (0.046)           | (0.046)           | (0.046)           | (0.047)           | (0.047)           |
| victim            | 0.038             | 0.029             | 0.037             | 0.030             |                   |                   |
|                   | (0.027)           | (0.027)           | (0.027)           | (0.027)           |                   |                   |
| neighprob         | 0.020             | 0.017             | 0.021             | 0.020             |                   |                   |
|                   | (0.019)           | (0.019)           | (0.019)           | (0.019)           |                   |                   |
| richer            | 0.201             |                   | 0.208             |                   |                   |                   |
|                   | (0.058)**         |                   | (0.058)**         |                   |                   |                   |
| poorer            | -0.300            |                   |                   |                   |                   |                   |

Dependent variable: Dummy =1 if respondent saves; =0 otherwise.

* p<0.1; ** p<0.05; *** p<0.01; Standard errors in parenthesis.
While the logit regressions show the effect of fear of crime on the likelihood of saving, the outcome equation of the Heckman Probit regression shows the effect of fear of crime on where savings are placed (see Table 4 and Table 5). Results provide evidence that cognitive fear of crime has no significant effect on whether one would save through formal or informal means. In contrast, affective fear has a positive effect on the likelihood of saving through formal means (banks). That is, individuals who are more afraid (affective) are more likely to keep their savings in banks than use informal methods such as keeping the money inside the house. However, affective fear of crime in Metro Manila shows results that are different from affective fear in one’s neighborhood. The former has positive effect across all regressions while the latter showed no significant effect.

Some control variables also turned significant. Older people, those with higher income, the more educated, and those who are single are more likely to save through formal means. The LR test of independent equations in all regression models is statistically significant, indicating that there really is selection bias and that the selection and outcome equations cannot be run separately.

Table 4. Coefficients of the Heckman Probit regression (Variable of interest: Cognitive fear).

| Variable   | Outcome Equation: Dummy =1 if respondent saves through formal means: =0 otherwise |
|------------|-----------------------------------------------------------------------------------|
| fearcog    | 0.068 (0.051) 0.079 (0.053) 0.079 (0.054)                                       |
| age        | 0.050 (0.024)** 0.049 (0.024)** 0.050 (0.024)**                                |
| age squared| -0.000 (0.000) -0.000 (0.000) -0.000 (0.000)                                   |
| sex        | 0.042 (0.113) 0.059 (0.112) 0.061 (0.114)                                      |
| educ2      | -0.040 (0.356) -0.032 (0.344) -0.048 (0.355)                                   |
| educ3      | 0.269 (0.342) 0.245 (0.329) 0.246 (0.339)                                      |
| Variable       | Coefficient 1 | Coefficient 2 | Coefficient 3 |
|----------------|---------------|---------------|---------------|
| educ4          | 0.311         | 0.273         | 0.278         |
|                | (0.352)       | (0.335)       | (0.348)       |
| educ5          | 0.564         | 0.519         | 0.526         |
|                | (0.371)       | (0.350)       | (0.369)       |
| inc2           | 0.183         | 0.152         | 0.176         |
|                | (0.212)       | (0.193)       | (0.222)       |
| inc3           | 0.730         | 0.702         | 0.723         |
|                | (0.386)*      | (0.363)*      | (0.388)*      |
| employed       | -0.401        | -0.395        | -0.394        |
|                | (0.120)*****  | (0.117)*****  | (0.120)*****  |
| separate       | 0.016         | 0.012         | 0.001         |
|                | (0.167)       | (0.163)       | (0.167)       |
| single         | 0.380         | 0.355         | 0.372         |
|                | (0.192)**     | (0.187)*      | (0.197)*      |
| victim         | -0.098        | -0.103        |               |
|                | (0.108)       | (0.111)       |               |
| neighprob      | -0.010        | -0.009        |               |
|                | (0.071)       | (0.073)       |               |
| media          |               | 0.009         |               |
|                |               | (0.012)       |               |
| _cons          | -0.975        | -0.855        | -0.983        |
|                | (0.731)       | (0.723)       | (0.780)       |

Selection Equation:
Dependent Variable: Dummy =1 if respondent saves: =0 otherwise

| Variable       | Coefficient 1 | Coefficient 2 | Coefficient 3 |
|----------------|---------------|---------------|---------------|
| fearcog        | -0.061        | -0.064        | -0.064        |
|                | (0.042)       | (0.043)       | (0.043)       |
| age            | -0.053        | -0.053        | -0.054        |
|                | (0.018)*****  | (0.018)*****  | (0.018)*****  |
| age squared    | 0.000         | 0.000         | 0.000         |
|                | (0.000)**     | (0.000)**     | (0.000)**     |
| sex            | -0.078        | -0.080        | -0.081        |
|                | (0.089)       | (0.089)       | (0.089)       |
| educ2          | 0.106         | 0.108         | 0.106         |
|                | (0.245)       | (0.245)       | (0.245)       |
| educ3          | 0.129         | 0.130         | 0.130         |
|                | (0.235)       | (0.234)       | (0.234)       |
| educ4          | 0.391         | 0.393         | 0.394         |
|                | (0.237)*      | (0.237)*      | (0.237)*      |
| educ5          | 0.470         | 0.472         | 0.474         |
|                | (0.240)**     | (0.239)**     | (0.239)**     |
| inc2           | 0.519         | 0.517         | 0.521         |
|                | (0.084)*****  | (0.084)*****  | (0.085)*****  |
| inc3           | 1.609         | 1.605         | 1.607         |
|                | (0.287)*****  | (0.287)*****  | (0.287)*****  |
| employed       | 0.318         | 0.317         | 0.317         |
|                | (0.086)*****  | (0.086)*****  | (0.086)*****  |
| separate       | -0.079        | -0.083        | -0.079        |
|                | (0.731)       | (0.723)       | (0.780)       |
### Table 5. Coefficients of the Heckman Probit regression (Variable of interest: Affective fear).

| Outcome Equation: | 0.073 | 0.080 | 0.081 |
|-------------------|-------|-------|-------|
| Fearaff_neigh     |       |       |       |
| Fearaff_mm        |       |       |       |
| Age               | 0.049 | 0.048 | 0.049 |
| Age squared       | -0.000| -0.000| -0.000|
| Sex               | 0.033 | 0.047 | 0.050 |
| Educ2             | -0.051| -0.046| -0.063|
| Educ3             | 0.241 | 0.219 | 0.219 |
| Educ4             | 0.287 | 0.253 | 0.257 |
| Educ5             | 0.542 | 0.503 | 0.510 |
| Inc2              | 0.169 | 0.143 | 0.165 |
| Inc3              | 0.707 | 0.684 | 0.704 |
| N                 | 1,179 | 1,179 | 1,179 |

* p<0.1; ** p<0.05; *** p<0.01; Standard errors in parenthesis.
| Variable       | Coefficient 1 | Coefficient 2 | Coefficient 3 | Coefficient 4 | Coefficient 5 | Coefficient 6 |
|----------------|---------------|---------------|---------------|---------------|---------------|---------------|
| employed       | -0.416        | -0.412        | -0.412        | -0.420        | -0.417        | -0.417        |
|                | (0.118)*****  | (0.115)*****  | (0.118)*****  | (0.119)*****  | (0.117)*****  | (0.120)*****  |
| separate       | 0.018         | 0.014         | 0.003         | 0.025         | 0.022         | 0.010         |
|                | (0.166)       | (0.162)       | (0.165)       | (0.169)       | (0.166)       | (0.169)       |
| single         | 0.386         | 0.365         | 0.383         | 0.383         | 0.362         | 0.383         |
|                | (0.192)****    | (0.188)**     | (0.198)**     | (0.193)****    | (0.190)**     | (0.201)**     |
| victim         | -0.087        | -0.092        | -0.080        | -0.085        | -0.080        | -0.085        |
|                | (0.107)       | (0.109)       | (0.108)       | (0.110)       | (0.108)       | (0.111)       |
| neighprob      | -0.006        | -0.006        | -0.007        | -0.006        | -0.007        | -0.007        |
|                | (0.069)       | (0.071)       | (0.070)       | (0.072)       | (0.070)       | (0.072)       |
| media          | 0.009         | 0.010         | 0.010         | 0.010         | 0.010         | 0.010         |
|                | (0.120)       | (0.120)       | (0.120)       | (0.120)       | (0.120)       | (0.120)       |
| _cons          | -0.895        | -0.784        | -0.910        | -1.095        | -0.982        | -1.131        |
|                | (0.714)       | (0.713)       | (0.764)       | (0.721)       | (0.728)       | (0.782)       |

**Selection Equation:**

Dependent Variable: Dummy =1 if respondent saves; =0 otherwise

- **fearaff_neigh**
  - Coefficient: -0.030
  - Standard Error: (0.048)

- **fearaff_mmm**
  - Coefficient: -0.117
  - Standard Error: (0.046)*****

- **age**
  - Coefficient: -0.054
  - Standard Error: (0.018)*****

- **age squared**
  - Coefficient: 0.000
  - Standard Error: (0.000)*****

- **sex**
  - Coefficient: -0.067
  - Standard Error: (0.089)

- **educ2**
  - Coefficient: 0.099
  - Standard Error: (0.244)

- **educ3**
  - Coefficient: 0.123
  - Standard Error: (0.234)

- **educ4**
  - Coefficient: 0.376
  - Standard Error: (0.236)

- **educ5**
  - Coefficient: 0.450
  - Standard Error: (0.238)**

- **inc2**
  - Coefficient: 0.514
  - Standard Error: (0.084)*****

- **inc3**
  - Coefficient: 1.626
  - Standard Error: (0.285)*****

- **employed**
  - Coefficient: 0.326
  - Standard Error: (0.086)*****

- **separate**
  - Coefficient: -0.080
  - Standard Error: (0.120)

- **single**
  - Coefficient: 0.205
  - Standard Error: (0.137)

- **victim**
  - Coefficient: 0.047
  - Standard Error: (0.083)

- **neighprob**
  - Coefficient: 0.046
  - Standard Error: (0.053)
V.B. Discussions and Implications

Regression results show evidence that fear of crime affects saving behavior, although it depends on how fear of crime is measured and on the aspect of saving. Fear of crime negatively affects the probability of saving. That is, people who are more afraid are less likely to save.

The results also provide evidence that affective fear has much greater effect than cognitive fear on the likelihood of saving. Cognitive fear is risk perception, or one’s assessment of how likely he/she will be victimized by crime, and thus appeals to rationality. On the other hand, affective fear is a measure of how afraid the individual is, and thus appeals to emotion. These results imply that saving behavior is affected more by emotional rather than rational fear of crime. When it comes to the effect of crime on savings, emotions have a greater effect than reason.

The negative effect of fear of crime on savings based on emotions is supported by studies similar to those in the literature review sections. Such papers as Kapoor (2008) and Loewenstein (2000) argue that present consumption is a coping mechanism to stress and uncertainty brought by negative emotions such as fear. Similarly, the model developed by Lowenstein (1996) shows how visceral factors like fear lead to greater discounting of the future. Greater discounting of the future means that an individual places greater value on the present; and thus present consumption is preferred. An increase in present consumption reduces a consumer’s savings and his/her ability and willingness to save.

Another result of interest is that affective fear of crime in Metro Manila as a whole has negative and significant effect on saving, but affective fear of crime in one’s own
neighbhorhood does not. In the survey, respondents have lower affective fear of crime in one’s own neighborhood than in Metro Manila, implying that people generally feel safer in their own neighborhood. That they feel safer in their own backyards could be the reason why it does not affect their decision whether to save or not.

In contrast to the emotional fear of crime, cognitive fear showed mostly insignificant coefficients. Only one out of the three logit regressions involving cognitive fear turned out negative and significant, but it lost its significance as more variables were controlled for. Cognitive fear of crime is an individual’s risk perception; the higher the cognitive fear, the more likely the individual thinks he/she will fall victim to a crime. Cognitive fear can thus be a measure of uncertainty. While economic theory and some empirical studies say that uncertainty about the future could induce people to save (Ghosh and Ostry 1997; Guiso et al 1992; Selden 1979; Sandmo 1970; Wachtel 1977), our results show mostly insignificant relationship between the two variables (and a negative relationship in the one equation where it turned significant). This could mean that the uncertainty brought by the rational fear of crime is not strong enough to induce a decision to save; and it is overpowered by the emotional fear, which induces present consumption.

In terms of the decision where to save, cognitive fear likewise does not have an effect whether one saves through formal or informal means. Affective fear of crime in the neighborhood also has no significant effect. In contrast, affective fear of crime in Metro Manila as a whole positively affects saving through formal means. This variable turned out positive and significant in all three Heckman Probit regressions, indicating that people who are more affected by emotional fear of crime are more likely to place their savings in formal institutions (banks). Similar to fear’s effect on the probability of saving, it is again the emotional fear rather than rational fear that affects saving through formal means. Moreover, it is the emotional fear of crime in Metro Manila, rather than in the respondent’s neighborhood, that exhibits this effect.

To summarize, results show evidence that it is the emotional rather than the rational (perceived risk) fear of crime that affects saving behavior in terms of likelihood to save and saving through formal means. Affective fear of crime has a negative effect on the decision to save but has a positive effect on the decision to save through formal means. Individuals with higher affective fear are less likely to save; but among those who do save, are more likely to save through formal channels (banks). An interesting result is that affective fear of crime in the community has no effect on saving, but affective fear of crime in Metro Manila has. This could mean
that the effect of fear on people’s saving behavior is via their fear of crime in the larger community that they belong to, rather than on their immediate neighborhood.

V. Summary and Conclusions

This paper attempts to determine the effect of fear of crime on the likelihood of saving and of saving through formal means. Two forms of fear of crime were tested – cognitive fear and affective fear. The former pertains to risk perception, or how likely the individual feels he/she will be victimized by crime, while the latter measures how afraid the person is. Cognitive fear thus appeals to rationality while affective fear appeals to the emotion. For affective fear, we also differentiated between affective fear of crime in Metro Manila as a whole and in the individual’s neighborhood.

Our results provide evidence that fear of crime affects saving behavior. In particular, affective fear of crime in the individual’s larger community decreases the likelihood of saving and increases the probability of saving through formal channels. However, cognitive fear shows mostly insignificant effect on the likelihood of saving and completely insignificant effect on saving through formal means. Affective fear of crime in one’s own neighborhood also has insignificant effect on savings.

This means that the emotional aspect of fear of crime far outweigh the rational aspect in terms of its effect on saving behavior. Moreover, it is the fear of crime in one’s larger environment – where one works, studies, or visit – rather than in his/her immediate neighborhood that has an effect on saving behavior.
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