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Personal Bankruptcy Law and Self-Employment Activity

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ABSTRACT:

Microeconomic theory suggests that risk aversion may result in people to take less optimal decision in a situation associated with risk. If people believe that being self-employed is riskier than being wage-employed, then at some point, risk averse wage-employed won't become self-employed even if it is optimal to do so. In this case, introducing some sort of insurance scheme may increase people's participation in self-employment activity. I use the family level data from Panel Study of Income Dynamics, and I exploit provisions in the United States' bankruptcy code, specifically the homestead exemption level, as the insurance institution. I find that the increase of exemption level by ten percentage point increases the probability of owning a business by 1.5 percentage points, after the year 2005. I also find that the effect is explained by the incorporated business.

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1. Introduction

Empirical research shows that entrepreneurship is one of the main drivers for economic growth. Meh and Terajima (2008) stated that the activity of entrepreneurs is important for innovation, capital accumulation, and development. Thurik et al (2008) examined the relationship between self-employment and unemployment. The data from 23 OECD countries from 1974 to 2002 confirmed the relationship that higher self-employment is correlated with lower unemployment levels. The European Commission (2010) stated that self-employment is an important driver in entrepreneurship and job creation and thus contributes to the European Union's goals of more growth and better jobs. The European Commission (2010) also stated that entrepreneurs have been particularly resilient to the impact of the economic crisis. They also state that many countries view entrepreneurship as a tool to combat unemployment. Self-employment is might also contribute to job creation, since 30% of the self-employed have employees of their own. Countries in the European Union have tried to promote self-employment through an array of policies. These include financial support, support services, training, mentoring and advice, business friendly administration, better tax and social security regimes.

The positive impact of entrepreneurship and self-employment on the economy thus justifies the creation of policies that encourage people to start their own business. An important aspect that might limit the entrepreneurship activities in a country are the risks involved in starting your own business. What might discourage people from starting a business? The literature has identified at least two possible problems for people to start their own business; costs and risks. The first one is the cost of certain necessities, like healthcare. Self-employed people often fall in a grey area in terms of the access to social security. In most countries, they are ineligible to receive unemployment benefits, and they also have no access to an employer-provided insurance scheme, like health insurance. If they are to provide themselves with the insurance by buying it from the market, the cost would be higher than the employer-provided insurance-scheme. Large corporations that employ many workers have a clear advantage in pooling risks. In this regard, people have an incentive to join large companies for insurance purposes. For the US market this phenomenon is titled "entrepreneurship lock", where the health insurance benefits provided by larger companies, prevents potential entrepreneurs from starting their own business (Fairlie et al, 2011). When workers try to switch jobs, they might face a loss in health insurance coverage, due to pre-existing exclusions of condition, spare time while looking for new jobs, and loss of some type of insurance plan (Fairlie et al, 2011).

The second problem is direct risk. Caliendo, Fossen and Kritikos (2006) cited in their paper that based on conventional wisdom they believe that risk-averse individuals will be less likely to involve themselves in the entrepreneurial business since it involves making risky decisions. They provide evidence that, to a certain degree, people with higher-risk aversion are less likely to move from wage-employment to self-employment. Meh and Terajima (2008) stated that self-employment also associated with higher risk than the wage-employment. They develop a quantitative model of entrepreneurial activity and consumer bankruptcy choices. Their model assumes the self-employed faced higher risks than wage workers. Self-employed and wage workers both face risk in earnings, but self-employed also face the risk in their productive asset. This leaves them with higher risk, and according to the model, they face a higher interest rate. Also, Meh and Terajima (2008) observed that entrepreneurs hold almost 3.5 times as much unsecured debt as non-entrepreneurs. Their debt-to-income ratio is higher than that of non-entrepreneurs. Cramer et al. (2002), conclude that, while assuming that people maintain a constant level of risk aversion over time, the

possibility to enter entrepreneurship decreases as the individual degree of risk aversion increases[1]. Brown et al. (2011) confirmed this finding. Using a hypothetical gamble, they suggest that willingness to take financial risk is positively associated with decision to become self-employed.

In this paper, I explore the role of insurance mechanism in the dynamics of occupational choice. Since literatures suggest that risk aversion is one of the reasons why people do not enter self-employment, even though it would be optimal to do so, introducing an insurance mechanism may increase the number of self-employed people[2]. The literature focuses on three different types of insurance mechanisms. The literature focuses on health-insurance provision (dealing with the problem of direct costs), the second one describes the provision of unemployment insurance (Fairlie et al. 2009; Velamuri, 2009; Hombart et al., 2013; Ejrnaes & Hochguertel, 2014). The third form of insurance, and the focus of this paper, is organized through the United States bankruptcy code, to self-employment activity (Fan & White, 2003; Cerqueiro & Penas, 2014; Berger et al., 2010). The literature suggests that there is a positive and significant causal relationship between the specified insurance mechanism and the levels of entrepreneurial activity.

The insurance mechanism that I chose is the bankruptcy code in the United States (US). The bankruptcy code provides people who have declared bankruptcy with partial wealth insurance (Fan and White (2003)). Therefore, the bankruptcy law decreases the amount of equities that will be taken from the entrepreneur should they fail to pay their debt.
In general, the US Bankruptcy Code offers two ways to file for bankruptcy. They are defined in chapter 7 and chapter 13 of the law. Under chapter 7, people will be exempted from a future repayment plan, in exchange of their non-exempted asset (this is known as a "fresh start"). There are two types of exemptions; the homestead, which protects your home, and the personal exemption, which protects other types of assets. Alternatively, under chapter 13, all of the debtor's assets will be exempted, but the filer has to propose a 5 year repayment plan out of future earnings. According to Fan and White (2003), as much as 70% of people opted for chapter 7 as opposed to chapter 13. The bankruptcy law is useful for research since different exemption levels are specified in chapter 7 of the law in different states, the levels also change over time. The freedom of the local government to implement their desired exemption level results in variation across states and time, which allows for the examination of the impact of different levels of exemption on the decision to be self-employed. These institutional facts make the US a very good place to study the impact of (partial) wealth insurance on the decision of doing business. I will discuss more about the U.S. Bankruptcy Code and why it has impact to the decision to start self-employment.

One of the main contributions of the present paper is the use of an alternative data set that has been used in a large number of contributions in labor economics. I use the Panel Study of Income Dynamics (PSID), and my observation period is 6 waves of biennial data, from 2001 until 2011. I investigate whether the change of exemption levels affects the probability of being self-employed or owning a business. The PSID allows me to conduct a fixed effects regression, controlling for the time-constant unobserved characteristics of the families. The years 2001 until 2011 are quite interesting, for several reasons. First, before 2005 exemption levels have limited variation across time and across states. After 2005, variations start to increase both across time and across states. Moreover, in 2005, the U.S.

[1] The study compares different individuals with different risk aversion, so this means individuals with higher risk aversion have less chance to enter entrepreneurship than individuals with smaller risk aversion.
[2] Among the papers that specifically deal with business and risk aversion behavior are Caliendo, Fossen and Kritikos (2006), Meh and Terajima (2008), Cramer et al (2002) and Brown et al (2011).

Congress passed the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), which revolutionized the U.S. bankruptcy code in general. Details are discussed in section 2.

Various studies have been done, covering both household level and firm level studies. On the household level, Fan and White (2003) find that the lowest quartile of homestead exemption leads to 10% increase of the probability of owning a business, and this number jumps 3.5 percentage points in the state with an unlimited exemption level. As for the firm level studies, Cerqueiro and Penas (2014) found that higher exemption levels significantly alters the distribution of credit to wealthier entrepreneurs. Meanwhile, Berger et al (2010) confirm that overall, entrepreneurs with higher access to debtor protection, had significantly lower access to credit markets. On the BAPCPA, Paik (2013) finds that the probability of becoming self-employed decreased after the BAPCPA, but only for unincorporated businesses. They argue that the main reason of this is because most unincorporated businesses fall within the small-size business category. The correlation between firm-size and the probability of being an unincorporated business explains the negative effect of BAPCPA in small-size firms. It is therefore the size of the firm that explains the negative effect. Unlike the positive and significant results found in previous research, this paper finds limited evidence that the debtor protection in exemption level significantly affects the probability of being self-employed or owning a business. There is some significant impact of the debtor protection in the results, but only during the second part of the observation period, the years 2005 until 2011.

The thesis is organized as follows. Section 2 discusses the detail of legal institutions and how they affect the behavior of household. Section 3 discusses in more detail previous literature concerning US bankruptcy code and entrepreneurship, with a focus on papers that are relevant for my specification. In section 4, we will see the methodology and I discuss about the dataset in section 5. Section 6 discusses the empirical result, and section 7 contains a summary and offers conclusions.

2. Institutions

In this section, I describe the legal setting of the Bankruptcy Reform Act of 1978, commonly referred to as the Bankruptcy Code. Furthermore, I introduce the main features of the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), and explain why this is important to the study.

a. The Bankruptcy Code

The most important aspect of the bankruptcy code is to protect the consumption of the debtor, through discharging some of their debt, if not all (White, 2006). With (part of) the wealth insured, the debtor doesn't have to worry about their consumption being cut down sharply. Providing (partial) wealth insurance increases the incentive to borrow more. An increase in the discharge will result in higher borrowing incentives.

The Bankruptcy Code provides a mechanism for the debtor to pay their debt in two ways; the liquidation (Chapter 7), and reorganization (Chapter 13). When filing for bankruptcy, debtors have the privilege to choose which mechanism they prefer. Under chapter 13, all of the current assets of the debtors are exempted. However, they have to propose a 5 year repayment plan. This plan basically uses a proportion of the debtor's future earnings over a five-year period to repay debt. Repayment plans should at least give the same amount they would receive under Chapter 7 to the creditors (Cerqueiro and Penas, 2014). This means, they do not have to liquidate their assets, and can still use it, both as productive

purpose or non-productive purpose, to keep earning their future income, and cut the income for the repayment plan. Meanwhile, if the debtors choose to file bankruptcy under chapter 7, all of their future earnings are exempted. They do not have to make a repayment plan. In exchange, all of their assets, excluding the exempted ones, will be liquidated to pay their debt. They thus have to pay less debt, and they can keep their future earnings. That is why chapter 7 is also referred to as 'the fresh start'. The level of exemption was created in 1978 for all states, but the congress gave the states the right to create their own exemption level. This means there is variation of the level of exemption, both across states, and across time, since from time to time, some states revised their exemption level. This exemption level is very important, since 70% of bankruptcy filing in the U.S. involves chapter 7 (Cerqueiro and Penas, 2014).

Generally, under chapter 7, there are two types of exemption, and they are the homestead exemption and the personal property exemption. Homestead exemption is the exemption for the equity in the owner-occupied residences, while the personal property exemption accounts for any other equity beside residences. Judging from the value of the exemption, personal property exemption is relatively inferior to the homestead exemption. Not only that, personal property exemption is hard to measure because there is a lot of diversity in assets, for example; vehicles, musical instruments, burial plots, the bible and other books, to pets, cattle, and crops. Furthermore, the types of personal assets specified in the law vary across states and are difficult to compare (Cerqueiro and Penas, 2014).

b. The Role of Exemption Level as Partial Wealth Insurance

In this section I explain how Fan and White (2003) describe the importance of the exemption level to reduce the risk of the self-employed, increasing their incentive to start a business. Let W be the wealth of a potential self-employed. She takes out a loan D to finance her investment of her firm by the amount of I, to gain expected return of R. If the loan is taken in the first period, then in second period, the debtor's asset will be A = W – I + D + R.

The debtor in period 2 has to choose to either pay the debt plus interest (equals to D(1+r)) or to file for bankruptcy under chapter 7. Let us define the exemption level in the place where the debtor resides as X, and the cost of filing a bankruptcy as high as C. Now that if the debtor files for bankruptcy, the debtor may be discharged of her obligation, but has to give up any wealth she owns exceeding the exemption level, or Max[A-C-X,0]. Given the two choices of either paying the debt or filing for bankruptcy, the debtor's wealth will be A-D(1+r) if she chooses to pay the debt, and X if she files for bankruptcy. Given this condition, there exists threshold A* = X+D(1+r) where the debtor is indifferent between the two options. The debtor files for bankruptcy if $A \leq A^*$ and does not file if $A > A^*$. The debtor's net wealth in period 2 after repaying the loan in full or filing for bankruptcy will be A - C if $A \leq X + C$, X if $X + C < A \leq A^*$, and A-D(1+r) if $A > A^*$. Now, there are basically three different states for the debtor. The first is to file for bankruptcy while the wealth is below the exemption level, the second state is to file for bankruptcy while the wealth is above the exemption level, and the third state is to pay the debt. In the first state, the debtor does not have to pay anything but the cost of filing for bankruptcy, while in the second state, the debtor pays up to the exemption level. Knowing the three states, then the decision to enter self-employment for the debtor is:

$$\int_{-\infty}^{X+C} U(A-C)f(A)dA + \int_{X+C}^{A^*} U(X)f(A)dA + \int_{A^*}^{\infty} U\big(A - D(1+r)\big)f(A)dA \geq U(W')$$

The left hand side of the equation contains the probability of the three states to occur. In other words, the left hand side represents the expected welfare gain of being in self-employment. The right hand side of the equation, which is U(W') is the gain from staying wage-employed. If the condition above holds, then a person will move to self-employment. Suppose that the interest rate is given, increasing the exemption level will increase the value of the left hand side of the equation. Meanwhile, since the right hand side does not depend on the exemption level, the higher the exemption level, the higher also the probability to enter self-employment. This is also true if we assume that the cost of filing bankruptcy C is zero. However, if C is positive, then the result will be ambiguous.

c. The Opportunistic Behavior

The U.S. personal bankruptcy law before 2005 provided a high level of consumption insurance by having a high wealth exemption, a 100% exemption for post-bankruptcy income, and low costs of filing (white, 2006). This, in turn, attracts an opportunistic behavior from debtors. White (2006) explained using the example of two types of human behavior, the opportunistic debtors and non-opportunistic debtors. Both of them borrow to smooth their consumption, but the non-opportunistic debtors do not take advantage of the bankruptcy code, in a sense that, they do not maximize their gain using the bankruptcy code. Opportunistic behavior may include borrowing more than non-opportunists, reallocating assets to the exempted ones, reallocating work effort accordingly so that the exempted income increases, hiding some assets or income from the bankruptcy court, and/or moving to states with higher exemptions (White, 2006). In the world where we assume that it is costly for lenders to identify the types of the debtors, it is only logical to think that, in the end, both types of borrower will borrow based on the same conditions, which hurts the non-opportunists.

White (2006) explained this opportunistic behavior. Consider non-opportunistic debtors' decision to file for bankruptcy. The debtors' financial gain from filing for bankruptcy under chapter 7 is:

$$\min\Big[D - \max[W - X, 0], 0\Big] - C$$

Where D is the unsecured debt that will be discharged in bankruptcy, W is wealth of the debtor, X is the level of exemption in the state where debtor filed for bankruptcy, and C is cost of filing for bankruptcy. We can think of this as lawyer's fees, filing fees, and unaccounted cost such as reputation and access to future credit. The equation implies that the financial gain from the debtor, who filed her bankruptcy under chapter 7, is equal to her debt, minus the exempted wealth. Unlimited X means that her gain is the whole debt, in other words, the debtor does not have to pay anything[3], after subtracting the costs.

For each debtor, there is a threshold wealth level, W*, such that the debtor is equally well off if s/he files or does not file for bankruptcy, which satisfies the condition W* - X + C = D (white, 2006). From this condition, it is obvious that higher exemption levels will increase the incentive to file for bankruptcy. Since W* is based on the value of X, opportunists have an incentive to shift the value of X.

[3] There is no such thing as unlimited X though, because the only limited one is, in some state, homestead exemption. X here accounted as all of the debtor's asset, including vehicles, musical instruments, and other type of asset.

d. Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA)

In April 14, 2005, the United States Congress passed a legislative act, and signed into law on April 20, 2005. The law is called the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), and it shifted the focus of the personal bankruptcy law from providing consumption insurance, to discouraging people to file for bankruptcy, for all types of debtors (White, 2006). In fact, BAPCPA was created in response to a credit supplier's plea after multiple failed attempts since 1997, and had the explicit intent to reduce the incentives to file for bankruptcy by irresponsible debtors (Paik, 2013).

The bankruptcy code pre-BAPCPA is apparently favoring the debtors too much. In fact, during the period 1994-2000, unsecured creditors received nothing in about 96% of chapter 7 bankruptcy filings and, in most chapter 13 cases, only mortgage creditors received something (White, 2006). In addition, the yearly bankruptcy filing rate rose steadily from 0.13% of the U.S. population in 1980 to 0.53% of the population in 2002-2004 and it jumped further to 0.68% in the year 2005, which may be because of the rushing debtors that wish to file for bankruptcy before BAPCPA went into effect (White, 2006).

There are two major changes that happened to the U.S. Bankruptcy Code after BAPCPA went into effect. The first important change is that debtors have to pass the median income test in order to file their bankruptcy under chapter 7. The median income test suggests that debtors' average monthly income should be lower than the median income level per month in the debtor's state of residence, adjusted for family size. Average median income of the debtor is calculated using the average of the debtor's six month income prior to the bankruptcy filing. Suppose that the debtor failed to pass the median income test, they will then have to undergo the repayment test.

The second innovation in BAPCPA is the repayment test. When the debtor fails the median income test, they are unable to file for bankruptcy under chapter 7. The repayment test suggests both whether debtors must file under chapter 13 or not, and how much they must repay, if they are able to file under chapter 13. Let monthly disposable income be the average monthly total income of the debtor, minus monthly allowable consumption of the debtor. The repayment test uses the debtor's monthly disposable income, over 5 years. If the debtor's 5 years disposable income exceeds $10,000 then the debtor must file their bankruptcy under chapter 13. If the debtor's 5 years disposable income is below $6,000 then the debtor is allowed to file under chapter 7. And if the debtor's 5 years disposable income is between $6,000 and $10,000, the debtor may file under chapter 7 if their 5 years disposable income is less than 25% of their unsecured debt.

Another change occurred after BAPCPA went into effect is the (accounted) cost of filing a bankruptcy. Bankruptcy attorneys generally charged less than $1,000 (plus filing fees) for a chapter 7 filing, while after BAPCPA, the cost of filing under chapter 7 will be $1,500 – 2,500 for lawyer's fees (White, 2006). Another important change is that BAPCPA reduced the amount of debt discharged in bankruptcy because some types of loans were no longer discharged.

e. The Impact of Bankruptcy Code and BAPCPA to the Self-Employed

With the institution like the Bankruptcy Code, when the debtor goes bankrupt, chapter 7 provides some degree of wealth protection. Wage-employment is said to be more secure since future earnings are guaranteed by their employer to some extent[4]. Because of the

[4] Note that this might hold for wage contracts that specify a certain salary, but will not hold for bonuses

existing risk-aversion of potential entrepreneurs, people will be less likely to take the risky path of self-employment, even if this option would result in higher pay-off (even after controlling for the risks). The bankruptcy code makes it possible for part of their wealth to be exempted, reducing the amount of debt they have to pay, if they go bankrupt. This part of the wealth will always be exempted, and allows the entrepreneurs to start over or to return to the job market, without losing much.

The introduction of BAPCPA changes several aspect of the Bankruptcy code. After BAPCPA, debtors can no longer choose freely between the two chapters. They have to undergo a test first. Thus, their optimal strategy now involves not only their form of wealth, but also their income and expenditures. However, a more important effect of the adoption of BAPCPA is that the added costs now decrease the incentive for debtors file for bankruptcy, now debtors will avoid filing for bankruptcy (White, 2006). From this statement, we can expect that, overall, the incentive to use bankruptcy code as wealth insurance for the self-employed might be slightly diminished, if not largely.

Since we assume that the self-employed people use the loan to finance their business, bankruptcy means they will have to give up their productive asset, thus losing their ability to gain future income from their business. This means that BAPCPA won't affect the decision of the debtor to choose between filing their bankruptcy under chapter 7 or chapter 13, since income is taken out of consideration. Cerqueiro and Penas (2014) do not take BAPCPA into account in their study because entrepreneurs can file for bankruptcy at their worst six month earning conditions. Therefore, entrepreneurs will still file for bankruptcy under chapter7. However, even if the BAPCPA doesn't directly affect the way U.S. Bankruptcy Code provides insurance, it might affect the credit supply. Since BAPCPA aims to limit opportunistic behavior, it should have an effect on the supply side of the financial market.

3. Previous Literature

There are three main bankruptcy studies that I am referring to, and one study about BAPCPA. The first is a household level study by Fan and White (2003). They examine the effect of personal bankruptcy exemptions to the decision to start a business. They used family-level panel data from the Survey of Income and Program Participation (SIPP) panels. The variable of interest is the level of exemption, which is assumed to be exogenously affecting the decision to own a business. Exemption is the amount of asset that does not have to be liquidated (and given to the creditors) in order to declare bankruptcy, and the amount is different among states. The exemption they were using is the exemption for equity[5] in owner-occupied housing, the "homestead" exemption, because the level of exemption was the largest and most varied across the states. So the hypothesis was that the higher the level of the exemption, the higher the probability to enter self-employment. They run a probit model on the data, and showed that the exemption dummies[6] have positive effect to the chance of starting a business. The probability of owning a business increases from 10% when the homestead exemption is in the lowest two quartiles to 11% when the exemption is in the highest two quartiles and jumps to 13.5% when the exemption is unlimited.

The probit and logit models are suitable with the research question, that is about the effect of exemption to the probability of owning a business, and it match for their cross

[5] Home equity that is used by Fan and White (2003) is the value of the house minus the mortgage. One of the reasons why homestead exemption is a good way to identify (partial) wealth insurance is because people can convert non-house equity to house equity by selling their non-house asset to pay their mortgage.

[6] Fan and White (2003) categorizes various exemption levels to four quartiles, and one category for unlimited exemption, making it 5 categories of exemption level.

sectional data. However, since the data lack of the longitudinal variation, the result might be biased by the other characteristics that may differ between states, and even so, between individuals.

A study about personal bankruptcy exemptions at firm level was conducted by Cerqueiro and Penas (2014). They identified the effect of personal bankruptcy exemptions using the capital injection as dependent variable, and the exemptions in each state as the independent variable. The capital injection can be two ways: through personal bank loans[7] or owner financing. The data that they use is taken from Kauffman Firm Survey (KFS). The general result is that the credit channel[8] through bank decreases as the exemption level increases. They also differentiate entrepreneurs by the amount of wealth, which is no wealth entrepreneur, low wealth entrepreneur and high wealth entrepreneur. The wealth measured instead of using a conventional wealth, a wealth that still has room for getting exempted. So for no wealth category, increasing exemption would not matter because they have no longer wealth to be exempted, while for wealthy entrepreneur, even if they got higher exemption, their remaining wealth still big enough to pay debts. So, the increase of exemption should affect more to the low wealth entrepreneur. Cerqueiro and Penas (2014) found that low wealth entrepreneurs permanently reduce the inflow of personal credit by six percent for a 10,000 USD increase in exemption limit. Still for the low wealth entrepreneurs, 10,000 USD increase in exemption limit leads to a reduction in credit card debt of almost four percent, and 5.6% reduction in the credit card limit. Meanwhile, wealthy entrepreneurs got their credit card limit higher by 3.4% every 10,000USD increase in exemption limit. They argue that the increase of exemption level leads to redistribution of credit supply from less wealthy entrepreneurs to wealthier entrepreneurs.

Another study at the firm level is done by Berger et al. (2010). They use both public and confidential data from the 1993, 1998, and 2003 Surveys of Small Business Finances (SSBF) to study the effects of bankruptcy law on small business credit. Their study is very similar to Cerqueiro and Penas (2014), but they use different measures of access to credit and the firm performance. Moreover, apparently they do not do fixed effect regression since they state that SSBF does not allow to follow the same firm over time. Another difference is they use two types of debtor protection. The first one is very similar with Cerqueiro and Penas (2014), but the second one is modified in that it focusese on the value of home equity that is protected, which is somehow better than just exemption. I will return to discussing this specification in section 4. Berger et al. (2010) find that in a state with higher exemption levels, firms face a higher chance to have their credit proposal denied by a bank. This effect is higher for self-proprietorship than incorporated firms. The probability of a proprietorship being denied credit or discouraged from borrowing increases 12 percentage points if the firm is located in a state with unlimited rather than zero homestead exemptions. As for the small corporations, the number is 5 percentage points. The smaller number indicates that their hypothesis is confirmed, that probability of being denied credit is higher for self-proprietorship in a state with higher exemption level. Nevertheless, the impact is significant for both type of small business.

In some sense, Cerqueiro and Penas (2014) and Berger et al. (2010) have the privilege to explore the supply side of financial market since they have the information from the Kauffman Firm Survey (KFS) and SSBF they were using. Both of the studies use Panel data. The difference is that Cerqueiro and Penas (2014) use firm fixed effect to tackle the problem

[7] Personal bank loans means the owner of the corporate or proprietorship borrow money from the bank using their names (not the firm's name), to finance the firm.

[8] Credit channel here means the way entrepreneurs finance their business, or to be specific, access to loans.

of unobserved characteristics the firms have, like entrepreneurial ability, while Berger et al (2010) are unable to do so because the nature of SSBF that prevents them to follow the same firm over different wave[9]. They also use longitudinal variation, which I refer to the difference of exemption level in the same state between two time frames. However, the study conducted by Cerqueiro and Penas (2014) concentrates on the performance of the firms, in a sense that a more generous exemption will increase willingness to borrow, and they argue that Borrowing is necessary for the firm to grow and perform better. The study of Cerqueiro and Penas (2014) and Berger et al (2010) focus more on the already established firms, while I am more concerned about the impact of the bankruptcy code to increase the number of self-employed. Another problem with the Cerqueiro and Penas (2014) and Berger et al (2010) approach is that they do not discuss much about BAPCPA in their studies.

Lastly, Paik (2013) examines the impact of BAPCPA to the probability of switching into self-employment. He uses pooled data taken from the March Current Population Survey (CPS), with the timespan of 2002-2008. The variation of his data comes from cross-sectional difference among individuals, and he identifies the BAPCPA using dummy variable for any observation during and over the year 2005. Identification strategy wise, he use the same technique as Fan and White (2003), but instead of using exemption level, he use dummy variable for BAPCPA identification. In fact, he doesn't use exemption level at all for his study. He finds that after the year 2005, the probability of people switching to self-employment in unincorporated form decreases by 19.3%, while for incorporated self-employment, he finds no evidence of impact.

4. Methodology

a. Building the Model

The mathematical model proposed by Fan and White (2003) shows that the bankruptcy system makes going into business more attractive for potential entrepreneurs by providing them with partial wealth insurance. Not only that, Fan and White (2003) also stated that his model suggests that this attractiveness of bankruptcy level increases as the partial wealth insurance increases, or in other words, the exemption level. These two statements suggest that in order to find the effect of the partial wealth insurance, I will need variation in the exemption level. This is what The United States (US) provides very nice circumstances, because the states have different exemption level.

Thus, I use the probability of being self-employed as my dependent variable. Then to answer the question whether or not the bankruptcy exemption matters to that, I use the state's exemption levels as the explanatory variable. The data I use, PSID, can be structured into panel data. My specification follows that of previous studies conducted by Fan and White (2003) and Cerqueiro and Penas (2014). The characteristic of my research is very similar to Fan and White (2003), which is the probability of a head of family having a start-up. Some aspects deserve discussion. Fan and White (2003) use cross-sectional data, which as I stated previously, lack longitudinal variation. This longitudinal variation is what I want to exploit by using the panel data.

As for the panel data handling, my research is closer to the model proposed by Cerqueiro and Penas (2014). Additionally, Cerqueiro and Penas (2014) use firm fixed effect to solve problem of the unobserved characteristics of the firm, which is also my concern with

[9] This makes Berger et al (2010) data is not a traditional panel data, bur more like a time series of cross-sectional data

the family. Thus, the model that matches the specification is the model proposed by Ejrnaes and Hochguertel (2014), the linear probability model with fixed effect. In their paper, Ejrnaes and Hochguertel (2014) use two stage regression to tackle endogenous Unemployment Insurance (UI). So, I checked further the possibility of the change of exemption level being endogenous, and if so, how previous papers dealt with it. During the observation period of Berger et al (2010), which is the year 2001 and 2003 in my observation period, they suggest that the only significant determinant of the post-1975 variation in exemption laws is the state exemption level in the 1920s, which basically means it is exogenous. In addition, Berger et al (2010) added that the change of exemption level is due to inflation.

Meanwhile, in the observation period of Cerqueiro and Penas (2014), which is in my case, the year 2005 and above, they state that this is the period where the variation of exemption is very high. They argue that there are three things that affect the change of exemption level. The first and most important is the gap between the homestead exemption value and current house prices. A second argument often used is that skyrocketing medical expenses increased the need of such protection by medically indebted households. The third argument is that the state's exemption level is much lower than the exemptions offered by the other states, which makes people run to better exemption level when they are about to file bankruptcy. Cerqueiro and Penas (2014) tackle this situation by adding average house value in each state in each year. I will deal with this by adding state dummy. State dummy is very convenient, since I will control also the economic environment and other institutions (like judicial) that might be different among states.

Another important aspect that I need to address is the main source of variation. The identification strategy proposed by Fan and White (2003) has the privilege to rely on the variable of the difference among families. Fixed effect regression allows me to take care of unobserved characteristics, but in a sense, doesn't allow me to have variations among families. The main variation I exploits come from families who change occupation across time. To check whether or not it's important, I also regress using random effect.

Other than the specification, I also use the way Cerqueiro and Penas (2014) handle the exemption level, which using log transformation. Fan and White (2003) divided the exemption levels to four categories, from lowest value in the first quartile, to unlimited in the fourth quartile. Cerqueiro and Penas (2014) put exactly the value of exemption level to the equation. Cerqueiro and Penas (2014) use the combination of personal exemption and homestead exemption as their total exemption level. As we discussed before, the personal exemption level is inferior by amount compare to the homestead exemption level, hard to measure, and each state has different and incomparable definitions of personal assets. So I will exclude the personal exemption level, and arrange exemption level per state per year.

Given all the argument above, my equation is:

$$y_{ist} = \alpha_i + \alpha_s + \alpha_t + \beta E_{st} + \delta X_{ist} + u_{ist}$$

Where i indexes the family, s indexes state and t indexes year. y is dependent variable of interest, α_i would be family fixed effect, α_t is time fixed effect, E is Exemption level, X is family characteristics and u is the error term.

For the dependent variable of interest, PSID allows me to have the information of self-employment occupational choice of the head of the family, as well as whether or not the family own business. The value is represented as dummy variables, and this will result in the variables as the stock of self-employment, as well as the stock of families with business. However, the problem here is how to deal with unemployment. The unemployment will mess with the study since in between the two states in the model, the payoff of being

unemployment should be lower than the two. Moreover, this payoff would not be affected by partial wealth insurance. Because of this issue, I decided to drop all families which have at least one state of unemployment in their time span. Fan and White (2003) as far as I red, also opt out the unemployment.

Another possibility to extend the study is the probability of owning a business. PSID also contain information about whether the family owns a business or not. Starting a business might have stronger dependence with the exemption level, as starting a business might require higher entry cost than simply self-employment. Moreover, Fairlie et al (2010) states the possibility of "job lock", which is caused by the pricy medical insurance for self-employed. While bankruptcy also helps to deal with "job lock", but the impact of firm medical insurance might affect more than the bankruptcy. Thus, I regress twice, using self-employment and business ownership as the dependent variable.

b. The Exemption Level

The most important explanatory variable here of course is the level of exemption. I use the exemption level from Cerqueiro and Penas (2014) and Berger et al (2010). The level of exemption is presented in the Table 1. The table shows 51 different states, with 3 different years. There are states which maintain the same level of exemption, such as Alabama and Missouri, and also state that change drastically such as District of Columbia.

First, I have to generate the exemption level across time. I only have the level of exemption in 2003, 2004 and 2008. That means, based on the exemption level, we can classified the exemption level among three groups. In the year 2001 and 2003, I will use 2003 exemption level. In the year 2005 and 2007, I will use 2004 exemption level. And for the year 2009 and 2011, I will use 2008 exemption level. This classification is necessary due to my currently limited access to the history of U.S. exemption level. This assumption is somewhat strong, but is not without justification.

According to Cerqueiro and Penas (2014), During, 2004-2008, some states enacted laws that increased substantially their homestead exemption levels. Four states (Minnesota, Montana, Nevada, and Rhode Island) experienced increases larger than $100,000 in their exemption levels, while six states (Delaware, Idaho, New Mexico, New York, South Carolina, and Washington) experienced increases between $50,000 and $100,000. Other states experienced smaller increases in their exemptions levels during the sample period. Moreover, according to Berger et al (2010), prior to 2003, the states have made relatively few changes in their exemption levels, and those who do, are only addressing the rate of inflation. This exemption level allow me to check the dynamics not only cross-counties, but also cross-time.

For the unlimited level of exemption, Berger et al (2010) use one million USD to replace the unlimited homestead exemption. However, I am using different dataset, so that method might not suits my study, so I have to check what value suits my data. I check the house equity in the PSID, which top-coded with the number 9,999,997[10] USD. Since in the realm of PSID, a family cannot have a house larger than this, I treat the value as unlimited. I also do the sensitivity analysis, and the report shows that the significant coefficient does not change as I put exemption higher than 9,999,999 USD. In addition, this value is higher than the value used by Berger et al. (2010), so I think this value is good enough.

[10] 9,999,998 USD and 9,999,999 USD are missing value. Thus in PSID, they considered 9,999,997 USD as the value of home equity 9,999,997 and higher.

To address the exemption level, the log transformation for debtor protection I use is the same method used by Cerqueiro and Penas (2014) and also Berger et al (2010). Thus the exemption level would be[11]:

$$D1_{st} = \log(1 + E_{st})$$

However, Berger et al use also another measurement for the debtor protection. The second specification for his debtor protection level is:

$$D2_{ist} = -\log(1 + (\max(\text{home equity}_{ist} - E_{st}, 0))$$

This way, the debtor protection really measures the value of benefit they can get. If the home equity is less than the exemption, then the argument will result 0, while if the home equity is higher than the exemption, then the argument will result in a positive amount[12].

Another thing that I can capitalize from this expression is that I do not have to worry about how to dress unlimited exemption. The first expression that uses directly exemption level will be altered if we change the number we set on the unlimited exemption level. That is why, conducting sensitivity test is necessary to make sure that our value will not mess up with the data. In a sense, this required some degree of assumption for the specification. The value of $D2_{st}$ however, will not be affected, as long as I set unlimited exemption, higher than any possible value of home equity. Sensitivity analysis is not necessary then, for the second specification. And lastly, this specification allows me to have different variation of debtor protection among families, while the first only have variation across states.

However, the interpretation of this debtor protection measurement becomes less straightforward. The variable is now not an exemption level, but the amount of dollars that the debtor is able to protect from the creditor. An increase of debtor protection by a dollar does not necessarily mean the debtor protection increases by the same amount.

Given the two debtor protection measurements, I use both of them. Since both of them should be able to identify the impact of the homestead exemption, both of them should work. Therefore, I have two different specifications for my regression, which the first specification use the Debtor Protection 1, while the second specification use Debtor Protection 2.

c. Other Control Variables

The individual fixed effect will reflect the unobserved characteristics of the family. For this reason, I have to use families which the head does not change across the time duration of my study. Meanwhile, time fixed effect captures the difference across time. One more important thing about the time fixed effect is that it should identify the impact of BAPCPA that is executed since 2005.

I include the wealth and income of the family to the equation. Wealth might provide a way of self-insurance to the family. I also add income to the equation, because income reflects the payoff of the family head. The head should choose to be self-employed when the expected income is higher. So, the coefficient of this should be significantly positive. There is

[11] I use log transformation for the exemption level to address the huge difference of the exemption level. 1+E is necessary since there are state in some time which have zero exemption level.

[12] Note that this does not mean the part of your house you can save, but instead the part of your house that is lost. Therefore, the log would result a reverse measurement. That is why we need negative value to redirect the measurement back

a possibility of multicollinearity between wealth and income. However, since the two provide important and different information, I decide to keep them in my model.

I have to be a little bit careful on how to use wealth for the two specifications of debtor protection. Berger et al (2010) add home equity for the first specification, but not in the second one. I argue that house value in my case may represent two different ways to affect the equation. The first is that the house value matters because exempted, which is logical why Berger et al (2010) add it to the first equation, but not the second one. However, it is also possible that home equity can be buffer even if it is not exempted, in a sense that home equity can work in the same way as other equity as insurance mechanism. This means I have to do a slight difference about home equity for the two specifications.

For the first specification, I add interaction between Debtor Protection1 with the home equity, and I also add home equity to the equation. The argument behind this specification is that the exemption might affect differently for the family with different home equity value. I log the home equity in the first equation, and give a minimum zero value because the home equity can't perform as buffer below zero. And in addition to the first specification, I add other equity. For the second specification, I will exclude home equity and interaction term, because it is already presented in Debtor Protection2. However, I use total equity instead of other equity, which is the sum of home equity and other equity. Since the debtor protection already captured by Debtor Protection2, then home equity will be functioned in the same way as other equity.

Now, for the BAPCPA, it will be measured by the year dummies. The coefficient for the year dummy above 2005 should be different than the coefficient for the year dummy 2003 and 2001, if the BAPCPA affect their decision to be self-employed. As I argue earlier, that BAPCPA may not affect much for the people who wants to make startup. If this is the case, then the positive impact of exemption might be overwhelmed by the lack of access to funding. But since this may rebalance the financial market, the supply of credit should be affected by BAPCPA, thus affects the debtors in general; especially those who want to make startup, and shows the more positive impact of the exemption level.

However, to make sure, I will also examine split regression. I will divide the regression into two, the pre BAPCPA, which is the year 2001 and 2003, and the post BAPCPA, which is the year 2005, 2007, 2009 and 2011. I would expect that post BAPCPA, the positive impact of exemption level will be bigger than the pre BAPCPA, and also probably be bigger than the overall regression.

d. <u>The Final Specification</u>

All in all, I classified my regression into three parts: The general year, the pre BAPCPA, and the post BAPCPA, each with two different specifications of exemptions. The first specification is:

$$y_{ist} = \alpha_i + \alpha_s + \alpha_t + \beta_1 D1_{st} + \beta_2 H_{ist} + \beta_3 D1_{st} H_{ist} + \beta_4 M_{ist} + \delta X_{ist} + u_{ist}$$

Where M means equities other than house, and H means home equity. Meanwhile, the second specification is:

$$y_{ist} = \alpha_i + \alpha_s + \alpha_t + \beta_1 D2_{ist} + \beta_2 W_{ist} + \delta X_{ist} + u_{ist}$$

Where W means total equity.

Thus from this model, I expect that the coefficient of the homestead exemption to be positive. This means that the higher the exemption, the more likely a person to become self-employment, where the head of the family expect greater payoff. I also expect the income, wealth and value of the house to be positive and significant. In addition, I expect the regression post BAPCPA to give higher impact than the pre BAPCPA and the general year.

5. Dataset

The data that I use is a family level dataset taken from the Panel Study of Income Dynamics (PSID)[13] directed by University of Michigan. Starting from 1968, PSID surveys a nationally representative sample over 18,000 individuals in 5,000 different families in the United States. The information covers employment, income, wealth, expenditures, health, marriage, childbearing and child development, and many other topics, and collected continuously. From 1968 to 2001, PSID constantly updated their survey annually. The observation is missing in 2002, and since 2003 they started to collect the data every two year, thus making biennial waves since then. PSID allows us to choose certain variables that we interested in, and makes customized codebook of our chosen variables. The panel structure is also very convenient to use once we understand the structure of the data.

I use biennial data from 2001 to 2011. In between, at 2005, we have the BAPCPA being executed. From 2001 on, the survey was conducted every two years. My dataset therefore has a two years gap between waves. Some individuals have gap in the time span of the observation due to attrition. Table 2 shows the descriptive statistics of the data that I use. It consists of the exemption level, employment status, business ownership, wealth information and the household characteristics. The household characteristics are usable for the random effect regression and consistency checking.

PSID facilitates data users who often want to look at data from the "same family" in certain waves, using the family composition change variable. This variable enables us to differentiate possibilities of "same family". Since I want to take care of the unobserved characteristics of the head of family, I define my "same families" as the family which has the same head over the time span of my study, allowing the change of wife and children over time[14] [15]. Overall, despite the weakness of two years interval, the data is very convenient to use. PSID also have all the information I need for the model I have.

Family level PSID contains the information on whether the head of the family is self-employed. Family level PSID also has information on whether the family owns a business, which may enrich the study. Not only that, family level PSID also has information about the total income and asset (excluding house value) that is owned by the family. Wealth is an important variable because, in a sense, wealth insures the family from shocks. The income in some sense might reflect some degree of insurance, but income is also important to reflect the

[13] Panel Study of Income Dynamics, public use dataset. Produced and distributed by the Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI (2014).

[14] Other possibilities of "same family" would be, for example, family that has the same head, wife and kids, or family that has the same only head and wife.

[15] I found two families which supposedly have same head, changed the race of the head across time. There is a little issue of race in PSID. In year 2001 and 2003, PSID included Spanish descendant in the race variable. However, in the year 2005 until 2011, they have own variable for Spanish descendant, and it categorize into Mexican, Mexican American, Chicano, Puerto Rican, Cuban, and other Spanish; Hispanic; Latino. Therefore, I just have Spanish descendant variable in my regression, and generalized all Spanish descendants in 2005 until 2011. Moreover, in 2001 and 2003, PSID classified Asian in one classification. In 2005 until 2011, PSID have category for Pacific.

payoff of the family. House value is also important because homestead exemption would not be so much interesting for families without a house[16]. One more important aspect for my study is that the PSID shows the state in which the family lives.

One of the reasons why I use PSID is that they have information about whether the head is self-employed or not, which is the core of my study. PSID characterized four kinds of employment in this variable, and those are fully wage-employed, partly wage-employed partly self-employed, fully self-employed, and unemployed. I only interested in the stock of employed people, so I have to deal with the unemployed. I do this by taking out any family, which head have unemployment status in at least once in any time span. I also combine the family which head have partly self-employed to the self-employed league, since it's the minority in my observation. Thus in the end, I have only two states of employment: either the head is wage-employed, or self-employed.

PSID also contains information I need for the second dependent variable, which is the business ownership. For the business ownership, PSID only categorize business ownership in two states, whether owns business or not. With this category, the family which doesn't have business and family which the head is unemployed is coded as the same category. But this has been taken care of automatically by the unemployed issue in the self-employment variable.

The wealth information in PSID is divided into two, the home equity and other equity. Since I use homestead exemption, the separation of the two is necessary since they act quite differently in this kind of insurance. For the home equity, the value is the real value of the house minus the mortgage. Since I assume that the creditors can't claim unpaid house anyway, I argue that it is better to use home equity instead of the real value of the house. Moreover, Berger et al (2010) also use home equity in their equation.

Table 3 shows the stock of self-employed and wage-employed across time. The stock of self-employed and wage-employed increases across time, but this is natural because the observation I have also increases across time. The proportion, however, doesn't seem to have any specific trend. The proportion of self-employed people in my dataset stays around 13% of the overall sample, and doesn't change much. Table 4 shows the stock of families with different business ownership status. The total observation is increases across time, same case with the employment status over time. However, we can see that the proportion of business ownership is constantly decreasing, following a negative trend. It starts with 17.99% of the families with business in 2001, going down to 14.55% of families with business in 2011. It jumps up a little from 14.95% in 2005 to 15.56% in 2007, but then facing another decreasing trend.

Table 5 shows the pooled cross-tabulation between the exemption level and employment status, and table 6 shows the pooled cross-tabulation between the exemption level and business ownership status. I pooled the exemption level, ignoring the year and states, resulting a bigger numbers of observation in some value, and small numbers of observation in another. For example, the exemption level of 37,000 USD only shows up once, North Carolina in 2008 (two waves of observation in my data, year 2009 and 2011), while the exemption level of 15,000 USD shows up six times, Missouri (all years), Indiana (2003), and Illinois (2003 and 2004). The value that showing up the most is unlimited, which shows up 23 times. I use these two tables as a base to make figure 1 and figure 2.

I tried to roughly investigate how the exemption level affects self-employment and business ownership stocks. Figure 1 shows the dynamics of employment status across exemption levels. It shows that there is no trend of the employment status, which gives me

[16] Housing value equal zero means the family doesn't own the house they are living in.

early evidence that the exemption level doesn't affect self-employment. Exemption level of 12,500 USD gives us the highest level of self-employed proportion, which is the exemption level of only Nebraska, and exemption level of 67,500 USD gives us the lowest level of self-employed proportion, which is the exemption level of only Alaska. This might indicates that the state variation other than exemption level affects more to the self-employed than the exemption level itself.

Figure 2 shows the fluctuation of business ownership status across different level of exemption. This business ownership fluctuation in this figure seems also stationary, that indicates no strong relationship between business ownership and exemption levels. Again, Nebraska which have 12,500 USD of homestead exemption, gives the highest proportion of families with business. However, this time the lowest proportion of families with business is contributed by 50,000 USD of homestead exemption, which consists of West Virginia (all year), Delaware and Idaho.

6. Result

This section discusses the results of the two regressions. As I discussed earlier, I also do the random effect regression in comparison to the fixed effect regression. The random effect regression results are represented in the Table 7, Table 8, and Table 9, and the fixed effect regression results are represented in Table 10, Table 11, and Table 12. All tables have exactly the same structure. Column (1) and Column (2) show the result of the first specification, while Column (3) and Column (4) show the result of the second specification. Column (1) and Column (3) use the probability of the head of family being self-employed, while Column (2) and Column (4) use the probability of the family owning a business as the dependent variable. Table 7 and Table 10 show the full observation from year 2001 to 2011; Table 8 and Table 11 show the result of pre-BAPCPA, and Table 9 and Table 12 shows the result of post-BAPCPA. For the reason of practicality, I don't report the dummy states.

As earlier discussed, to inspect whether fixed effect model is a good idea, I do the random effect regression to compare with the fixed effect regression. If we compare Table 7 and Table 10, we can see that the difference of debtor protection coefficient in the first specification is quite small. However, the coefficient of the wealth and second specification of debtor protection differ significantly. And this result is consistent also with other comparison, which are Table 8 versus Table 11, and Table 9 versus Table 12. This finding suggests me to keep the fixed effect model.

Table 10 shows the overall result of my observation. I barely find anything significant using my specification for the whole observation. Both the debtor protection variables in the two specifications are not significant. For the first specification, even the home equity variable is not significant, suggesting that the value of the house of the family doesn't affect the probability of being a self-employed or owning a business. However, other equity is significant, and gives the sign I expected. For the second specification, total equity is affecting significantly to the both probability of the head being self-employed, and the family owning a business. Also, in this regression, income is strongly significant, and shows the sign I expected.

The year dummies for the general year are also not showing any sign of significance. This means my attempt to capture the effect of BAPCPA using the year dummy is either failed or the BAPCPA doesn't affect to the self-employment and making business. Therefore, I divide the regression into two separate observations. The result of second regression, that is the year 2001 and 2003 observation, is shown in Table 3.

Based on the Table 11, the pre BAPCPA regression doesn't show result closer to my expectation. Additionally, in the pre BAPCPA regression, the other equity variable is not significant as well to the probability of starting a business, and the income variable becomes insignificant in all four cases. Other variables that are significant are age of head and the year dummy for 2003.

Meanwhile, in table 12, I present the result of post BAPCPA regression, the year 2005 until 2011. Wealth variable in this regression all are significant, as well as income, as expected. However this time, we can see a significance of the debtor protection variable in the Column (4) in the table 4. The result suggests that an increase of debtor protection by 1 percent increases the probability of making a business by 0.15 percentage point. How meaningful is this, however, is not so easy to tell. Fan and White (2003) shows that their two lower bracket of exemption level contribute to increase of the probability to start a business by ten percent. The third quartile of the exemption increases the probability by one percentage point, and from the third quartile to the highest quartile increase the probability by 3.5 percentage point. This is hard to measure and compare to my result, but given that every increase of exemption level by ten percentage point gives increase of probability by 1.5 percentage point, I would say that my result is highly comparable to what Fan and White (2003) have done.

This result is interesting. We can say then, that after BAPCPA, the exemption level affects the decision to start business, whereas before the introduction of BAPCPA was not. The result of Cerqueiro and Penas (2014) and Berger et al (2010) suggests that in a state where exemption is high, access to credit is also becomes harder. BAPCPA should not directly affect the entrepreneur. However, BAPCPA was created to prevent the abuse of the exemption by the debtor, so the credit supply condition should be better after BAPCPA. Both Cerqueiro and Penas (2014) and Berger et al (2010) succeed in proving that more exemption leads to less growth of firms and access to credit. While Cerqueiro and Penas (2014) observe after BAPCPA and Berger et al (2010) observe the timespan before BAPCPA, their research is very hard to compare, since they use different data and different measurement of access to credit and firm growth. They also don't discuss much about BAPCPA in their paper.

I tried to examine the case of difference between limited liabilities and unlimited liabilities. First I drop the observation that have their business unincorporated, and then regress them. This makes the sample to consist only of wage-employed and families that have an incorporated business. Secondly, I drop the families that own incorporated business. This suggests a sample consisting of wage-employed heads without a business and families with unincorporated businesses. Most of the results do not show any sign of significance, which are not explaining anything (results not shown). For the case of post-BAPCPA however, the result is quite interesting, which is shown in table 5.

The result shows strong significance level only to the incorporated business. The coefficient is also similar to the result shown in table 4 Column (4). This indicates that the variation post-BAPCPA is explained mostly, if not all, by the incorporated business. As we can see, the effect of debtor protection does not show any significance to unincorporated business. This means in the area where debtor protection is high, the probability of having incorporated business is higher. Looking at the result by Cerqueiro and Penas (2014), which in high exemption states, wealthy firm owners tend to increase their debt, it might be comparable to my result if we assume that wealthy firm owners are usually incorporated. However, in Cerqueiro and Penas (2014) work, the dataset consist only of established firms, which can't tell us anything about the entry condition of firms. This means I cannot say that less access to finance in incorporated business leads to fewer incorporated firms. To check

the supply credit, we need to have information about the source of these businesses' financing, which I do not have in PSID.

Given the reported findings, it is too soon to conclude that after BAPCPA, the bankruptcy code attracts more start-ups. If we take a closer look at the coefficient, it seems that the Pre BAPCPA differs greatly with the other two. The general regression and the post BAPCPA regression seems to be close. If we take a look again at Table 4, we can see that before 2005, the proportion of business owner is around 17.6%, but it drops relatively sharp in 2005 to 14.95%. But after that, it seems that the proportion of business owner follows a positive trend, but never reaches as high as before 2005. It is possible to suspect that from the very beginning, the data in the pre BAPCPA is not well treated, and the variation in the general regression comes from the post BAPCPA.

None of the regression that I do provide any clear evidence that the bankruptcy code increases the probability to be self-employed. Since I find little evidence that exemption level encourage business, this might suggest that what determine people to become self-employment is different than what determine family to start their business. One explanation that comes to my mind is the "Involuntary self-employment". According to the European Commission (2010), this is trending in Europe. Involuntary self-employment is a phenomenon where the worker is essentially forced to be self-employed by the employer, so that the employers can avoid the costs associated with social security contributions. Fairlie et al (2010) and also Cerqueiro and Penas (2014) suggest that healthcare in the United States is so costly, it is normal for the employer to do so. However, to prove this, more thorough study needs to be done.

7. Summary

The literature suggests that one of the reasons why in general many people avoid self-employment is risk aversion. If risk aversion prevents people from becoming self-employed, even if it's optimal to do so, then introducing some kind of insurance mechanism will encourage people to change their decision. A possible institution which could provide a form of insurance is the bankruptcy code.

This paper investigates if the partial wealth insurance principle from the bankruptcy code encourages people to seek out self-employment. The nature of the U.S. Bankruptcy Code differs across states and (some of them) across time, allowing me to study the variation in exemption levels across states and over time. I use a fixed effect regression to control for unobserved characteristics of the family, and rely on the within variation to capture the effect of debtor protection to the probability of being self-employed and owning a business. My most noteworthy limitation is the lack of data on exemption levels for some years. I use only the exemption level that I acquired from Cerqueiro and Penas (2014) and Berger et al (2010). They show exemption levels of the year 2003, 2004 and 2008, and I use it for 6 waves of 10 years' time-span. When we combine this with the biennial trait of PSID, there might be some missing information and variation that might be important, especially for observations before BAPCPA.

I find no evidence that the exemption level affects the probability of being self-employed. However, I find that during the timespan after BAPCPA, the exemption level affects the probability of having a family business. The increase of debtor protection by one percent increases the probability of having a family business by 0.15 percentage points. This result is roughly comparable to the study conducted by Fan and White (2003), and confirms the result. I also find that the impact of debtor protection after BAPCPA explained by the incorporated business.

Fan and White (2003) argued that the passing of BAPCPA would make it harder for small-business because of the increased overall cost to file for bankruptcy, and this may prevents them to file for bankruptcy at all. Moreover, Fan and White (2003) add that BAPCPA might even discourage owners of failed business to take high-paying jobs, because they can't file for Chapter 7 if their income failed to pass the median income test. The percentage of business owners in Table 4 that drops exactly in the year 2005 seems to confirm this. However, the proportion of business owners continues to rise. This paper shows that higher exemption level increases the probability of owning a business after BAPCPA, contradicting the hypothesis about the relationship between self-employment and BAPCPA.

The fact that my result explained by the incorporate business might suggest that it is interesting to explore the bankruptcy code and the dynamics of corporate and incorporate business. Furthermore, an interesting question is whether the U.S. Bankruptcy Code attracts inefficient businessmen, and moral hazard behavior. The passing of BAPCPA somewhat proves that people abuse U.S. Bankruptcy code to optimize their gain. It is only natural to suspect that this might also be the case for the entrepreneur. If the US bankruptcy code attracts inefficient entrepreneurs and increases moral hazard behavior, then the code fails to optimize proper entrepreneurial behavior.

Initially, the U.S. Bankruptcy Code was designed to protect the consumption of failed debtors. Because the Bankruptcy Code wasn't designed to encourage self-employment activity it may not be the only or the optimal tool for stimulating entrepreneurship. Studying the impact of other types of insurance mechanisms on entrepreneurial activity and self-employment levels is thus an interesting area for future research.

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APPENDIX

Table 1 Homestead Exemption Level

state	Exemption Level (US$)		
	2003	2004	2008
Alabama	10,000	10,000	10,000
Alaska	67,500	67,500	70,200
Arizona	100,000	150,000	150,000
Arkansas	unlimited	unlimited	unlimited
California	75,000	75,000	75,000
Colorado	90,000	90,000	120,000
Connecticut	150,000	150,000	150,000
Delaware	0	0	50,000
District of Columbia	36,900	unlimited	unlimited
Florida	unlimited	unlimited	unlimited
Georgia	20,000	20,000	20,000
Hawaii	36,900	36,900	40,400
Idaho	50,000	50,000	100,000
Illinois	15,000	15,000	30,000
Indiana	15,000	10,000	30,000
Iowa	unlimited	unlimited	unlimited
Kansas	unlimited	unlimited	unlimited
Kentucky	10,000	36,900	40,400
Louisiana	25,000	25,000	25,000
Maine	70,000	70,000	95,000
Maryland	0	0	0
Massachusetts	500,000	500,000	500,000
Michigan	36,900	36,900	40,400
Minnesota	200,000	200,000	300,000
Mississippi	150,000	150,000	150,000
Missouri	15,000	15,000	15,000
Montana	200,000	200,000	500,000
Nebraska	12,500	12,500	60,000
Nevada	200,000	200,000	550,000
New Hampshire	200,000	200,000	200,000
New Jersey	36,900	36,900	40,400
New york	20,000	20,000	100,000
Nex Mexico	60,000	60,000	120,000
North Carolina	20,000	20,000	37,000
North Dakota	80,000	80,000	80,000
Ohio	10,000	10,000	40,400
Oklahoma	unlimited	unlimited	unlimited
Oregon	33,000	33,000	39,600
Pennsylvania	36,900	36,900	40,400
Rhode Island	200,000	200,000	300,000
South Carolina	36,900	36,900	100,000
South Dakota	unlimited	unlimited	unlimited
Tennesse	7,500	7,500	7,500
Texas	unlimited	unlimited	unlimited
Utah	40,000	40,000	40,000
Vermont	150,000	150,000	150,000
Virginia	10,000	10,000	10,000
Washington	40,000	40,000	125,000
West Virginia	50,000	50,000	50,000
Wisconsin	40,000	40,000	40,000
Wyoming	20,000	20,000	20,000
Median Exemption	36,900	36,900	50,000

Table 2 Descriptive Statistics

Variable	Mean	Std. Dev.
employment status (=1 if head is self-employed)	0.13	0.34
business ownership (=1 if family owns business)	0.16	0.36
exemption level (Unlimited = 9,999,999)	1,680,149	3,666,386
income	80,650.15	114,208.00
home equity	73,863.59	166,001.50
other equity	171,075.80	871,837.90
age of head	42.52	11.92
sex of head	0.75	0.43
age of wife	26.35	22.29
education of head	13.62	2.23
education of wife	8.64	6.93
number of children	0.95	1.14
age of youngest children	3.68	5.20
marital status (=1 if head is married)	0.59	0.49

Table 3 Wage-employed and self-employed stock across time

year	wage-employed	self-employed	Total	wage-employed	self-employed
2001	2,282	353	2,635	86.60%	13.40%
2003	2,484	399	2,883	86.16%	13.84%
2005	3,079	445	3,524	87.37%	12.63%
2007	3,349	487	3,836	87.30%	12.70%
2009	3,913	605	4,518	86.61%	13.39%
2011	4,175	658	4,833	86.39%	13.61%
Total	19,282	2,947	22,229	86.74%	13.26%

Table 4 Stock of business ownership status of families across time

year	doesn't own business	own business	Total	doesn't own business	own business
2001	2,161	474	2,635	82.01%	17.99%
2003	2,382	501	2,883	82.62%	17.38%
2005	2,997	527	3,524	85.05%	14.95%
2007	3,239	597	3,836	84.44%	15.56%
2009	3,823	695	4,518	84.62%	15.38%
2011	4,130	703	4,833	85.45%	14.55%
Total	18,732	3,497	22,229	84.27%	15.73%

Table 5 Tabulation of exemption level and the stock of wage-employed and self-employed

exemption	wage-employed	self-employed	Total	wage-employed per cent	self-employed per cent
0	649	87	736	88.18%	11.82%
7500	409	68	477	85.74%	14.26%
10000	1,706	221	1,927	88.53%	11.47%
12500	96	35	131	73.28%	26.72%
15000	1,118	203	1,321	84.63%	15.37%
20000	1,730	238	1,968	87.91%	12.09%
25000	278	32	310	89.68%	10.32%
30000	533	68	601	88.69%	11.31%
33000	235	32	267	88.01%	11.99%
36900	1,927	215	2,142	89.96%	10.04%
37000	441	49	490	90.00%	10.00%
39600	162	21	183	88.52%	11.48%
40000	723	112	835	86.59%	13.41%
40400	1,374	168	1,542	89.11%	10.89%
50000	55	6	61	90.16%	9.84%
60000	95	20	115	82.61%	17.39%
67500	29	0	29	100.00%	0.00%
70000	62	2	64	96.88%	3.13%
70200	13	2	15	86.67%	13.33%
75000	1,286	240	1,526	84.27%	15.73%
80000	26	6	32	81.25%	18.75%
90000	207	29	236	87.71%	12.29%
95000	39	2	41	95.12%	4.88%
100000	739	118	857	86.23%	13.77%
120000	191	25	216	88.43%	11.57%
125000	154	37	191	80.63%	19.37%
150000	1,006	133	1,139	88.32%	11.68%
200000	321	75	396	81.06%	18.94%
300000	126	39	165	76.36%	23.64%
500000	450	82	532	84.59%	15.41%
550000	55	16	71	77.46%	22.54%
Unlimited	3,047	566	3,613	84.33%	15.67%
Total	19,282	2,947	22,229	86.74%	13.26%

Table 6 Tabulation of exemption level and the stock of business ownership of the families

exemption	doesn't own business	own business	Total	own business per cent	doesn't own business per cent
0	631	105	736	85.73%	14.27%
7500	407	70	477	85.32%	14.68%
10000	1,666	261	1,927	86.46%	13.54%
12500	94	37	131	71.76%	28.24%
15000	1,089	232	1,321	82.44%	17.56%
20000	1,652	316	1,968	83.94%	16.06%
25000	275	35	310	88.71%	11.29%
30000	524	77	601	87.19%	12.81%
33000	225	42	267	84.27%	15.73%
36900	1,861	281	2,142	86.88%	13.12%
37000	426	64	490	86.94%	13.06%
39600	162	21	183	88.52%	11.48%
40000	679	156	835	81.32%	18.68%
40400	1,333	209	1,542	86.45%	13.55%
50000	57	4	61	93.44%	6.56%
60000	86	29	115	74.78%	25.22%
67500	25	4	29	86.21%	13.79%
70000	56	8	64	87.50%	12.50%
70200	11	4	15	73.33%	26.67%
75000	1,236	290	1,526	81.00%	19.00%
80000	27	5	32	84.38%	15.63%
90000	197	39	236	83.47%	16.53%
95000	38	3	41	92.68%	7.32%
100000	731	126	857	85.30%	14.70%
120000	178	38	216	82.41%	17.59%
125000	139	52	191	72.77%	27.23%
150000	1,009	130	1,139	88.59%	11.41%
200000	304	92	396	76.77%	23.23%
300000	119	46	165	72.12%	27.88%
500000	427	105	532	80.26%	19.74%
550000	54	17	71	76.06%	23.94%
Unlimited	3,014	599	3,613	83.42%	16.58%
Total	18,732	3,497	22,229	84.27%	15.73%

Figure 1 Dynamics of wage-employed and self-employed stock in different homestead exemption levels

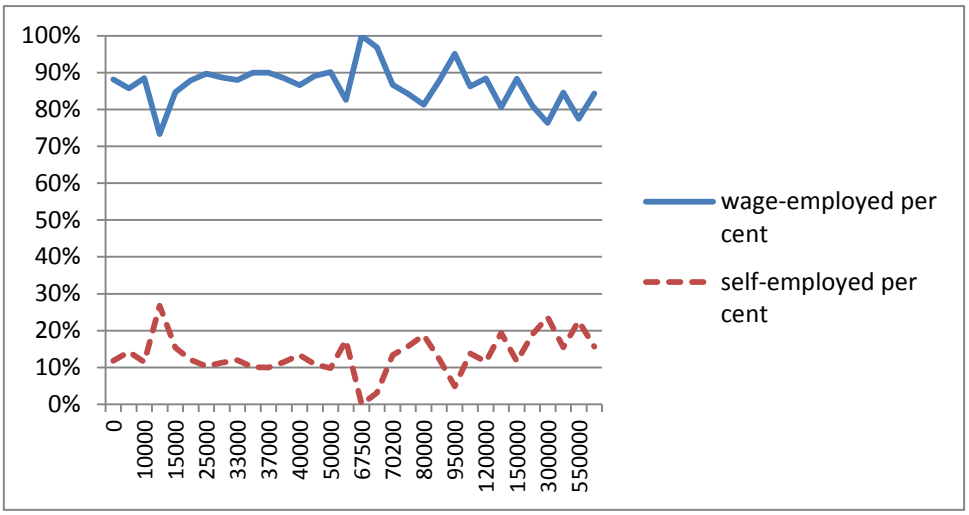

Figure 2 Dynamics of business ownership of families stock in different homestead exemption levels

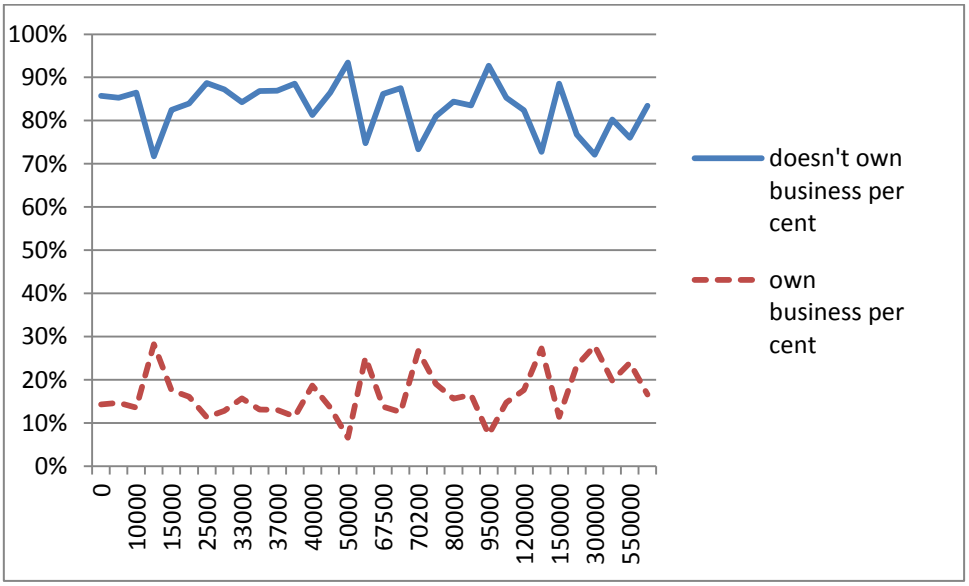

Table 7 Impact of Exemption Level, Full Observation, Random Effect

VARIABLES	(1) self	(2) bus	(3) self	(4) bus
D1	0.000592	0.00427		
	(0.00479)	(0.00536)		
D1 * home equity	4.55e-05	0.000114		
	(0.000135)	(0.000146)		
home equity	-7.76e-05	0.000176		
	(0.00158)	(0.00171)		
other equity (million USD)	2.71e-08***	3.41e-08***		
	(2.45e-09)	(2.72e-09)		
D2			-0.00155***	-0.00151***
			(0.000513)	(0.000562)
other equity + home equity (million USD)			2.66e-08***	3.36e-08***
			(2.37e-09)	(2.61e-09)
income (million USD)	1.37e-07***	2.17e-07***	1.30e-07***	2.11e-07***
	(2.11e-08)	(2.32e-08)	(2.11e-08)	(2.32e-08)
head education	-0.00279*	0.00715***	-0.00322**	0.00687***
	(0.00147)	(0.00151)	(0.00147)	(0.00152)
wife education	0.00119	0.00189	0.00120	0.00205
	(0.00124)	(0.00130)	(0.00124)	(0.00130)
age of head	0.00339***	0.00272***	0.00323***	0.00270***
	(0.000417)	(0.000427)	(0.000414)	(0.000424)
age of wife	-0.000310	0.000163	-0.000378	8.41e-05
	(0.000423)	(0.000441)	(0.000424)	(0.000442)
number of children	0.00739***	0.00635**	0.00721***	0.00620**
	(0.00249)	(0.00269)	(0.00249)	(0.00269)
age of youngest child	0.000117	-0.000145	0.000109	-0.000129
	(0.000418)	(0.000462)	(0.000417)	(0.000462)
marriage status	-0.0339***	-0.00684	-0.0333***	-0.00453
	(0.0126)	(0.0134)	(0.0126)	(0.0133)
dummy for year 2003	0.00622	-0.00181	0.00554	-0.00231
	(0.00577)	(0.00653)	(0.00577)	(0.00652)
dummy for year 2005	-0.00430	-0.0221***	-0.00586	-0.0235***
	(0.00567)	(0.00638)	(0.00567)	(0.00638)
dummy for year 2007	-0.00592	-0.0172***	-0.00798	-0.0192***
	(0.00574)	(0.00642)	(0.00575)	(0.00643)
dummy for year 2009	0.000115	-0.0241***	0.000431	-0.0230***
	(0.00609)	(0.00676)	(0.00581)	(0.00644)
dummy for year 2011	0.00453	-0.0281***	0.00551	-0.0267***
	(0.00625)	(0.00688)	(0.00597)	(0.00656)
sex of head	0.0642***	0.0552***	0.0645***	0.0551***
	(0.0102)	(0.0105)	(0.0102)	(0.0105)
head is white	0.00925	0.0795	0.00827	0.0781
	(0.0752)	(0.0762)	(0.0752)	(0.0762)
head is black	-0.0356	0.0225	-0.0342	0.0219
	(0.0754)	(0.0764)	(0.0754)	(0.0764)
head is native american	-0.0196	0.0224	-0.0185	0.0225
	(0.0936)	(0.0945)	(0.0936)	(0.0945)
head is hispanic	-0.0319*	-0.0572***	-0.0307*	-0.0565***
	(0.0180)	(0.0182)	(0.0180)	(0.0182)
head is asian	-0.0115	0.0216	-0.0129	0.0201
	(0.0802)	(0.0812)	(0.0802)	(0.0812)
head is other race	0.0198	0.0911	0.0198	0.0900
	(0.0799)	(0.0809)	(0.0799)	(0.0809)
Constant	0.00124	-0.191*	0.0143	-0.147*
	(0.0952)	(0.0990)	(0.0842)	(0.0856)
Observations	22,229	22,229	22,229	22,229
R-squared				
Number of families	6,273	6,273	6,273	6,273

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8 Impact of Exemption Level, Pre BAPCPA (2001 – 2003), Random Effect

VARIABLES	(1) self	(2) bus	(3) self	(4) bus
D1	-0.201	-0.00967		
	(0.125)	(0.132)		
D1 * home equity	0.000152	-0.000127		
	(0.000269)	(0.000297)		
home equity	-0.00108	0.00496		
	(0.00307)	(0.00340)		
other equity (million USD)	2.49e-08***	2.60e-08***		
	(3.88e-09)	(4.43e-09)		
D2			-0.00216**	-0.00349***
			(0.000915)	(0.00104)
other equity + home equity (million USD)			2.54e-08***	2.64e-08***
			(3.80e-09)	(4.33e-09)
income (million USD)	2.04e-07***	2.22e-07***	1.91e-07***	2.13e-07***
	(3.89e-08)	(4.52e-08)	(3.90e-08)	(4.54e-08)
head education	0.000944	0.00773***	0.000343	0.00729***
	(0.00217)	(0.00231)	(0.00218)	(0.00232)
wife education	0.00286	0.00274	0.00275	0.00314
	(0.00219)	(0.00233)	(0.00218)	(0.00232)
age of head	0.00369***	0.00314***	0.00350***	0.00319***
	(0.000674)	(0.000712)	(0.000669)	(0.000707)
age of wife	0.000972	-3.58e-05	0.000903	-0.000118
	(0.000711)	(0.000753)	(0.000711)	(0.000752)
number of children	0.00947**	0.0135***	0.00931**	0.0134***
	(0.00454)	(0.00497)	(0.00454)	(0.00497)
age of youngest child	-0.000651	-0.000594	-0.000681	-0.000589
	(0.000785)	(0.000892)	(0.000785)	(0.000891)
marriage status	-0.0978***	-0.0257	-0.0965***	-0.0209
	(0.0255)	(0.0276)	(0.0255)	(0.0276)
dummy for year 2003	0.00133	-0.0113**	0.000601	-0.0120**
	(0.00447)	(0.00547)	(0.00448)	(0.00547)
sex of head	0.0400**	0.0563***	0.0400**	0.0557***
	(0.0173)	(0.0182)	(0.0173)	(0.0182)
head is white	-0.0462	0.0160	-0.0485	0.0154
	(0.0381)	(0.0400)	(0.0381)	(0.0400)
head is black	-0.125***	-0.0717*	-0.123***	-0.0713*
	(0.0392)	(0.0412)	(0.0392)	(0.0411)
head is native american	-0.206**	-0.0707	-0.207**	-0.0732
	(0.0926)	(0.0975)	(0.0925)	(0.0974)
head is hispanic	-0.0469	-0.0461	-0.0462	-0.0449
	(0.0349)	(0.0366)	(0.0349)	(0.0366)
head is asian	-0.108**	-0.0392	-0.110**	-0.0428
	(0.0541)	(0.0569)	(0.0540)	(0.0568)
head is other race	-0.0294	0.0278	-0.0297	0.0271
	(0.0505)	(0.0529)	(0.0504)	(0.0528)
Constant	1.892	-0.0811	0.0461	-0.163**
	(1.167)	(1.230)	(0.0683)	(0.0722)
Observations	7,149	7,149	7,149	7,149
R-squared				
Number of pid	4,079	4,079	4,079	4,079

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9 Impact of Exemption Level, Post BAPCPA (2005 – 2011), Random Effect

VARIABLES	(1) self	(2) bus	(3) self	(4) bus
D1	-0.000705	0.00702		
	(0.00572)	(0.00608)		
D1 * home equity	-2.65e-05	3.79e-05		
	(0.000151)	(0.000155)		
home equity	0.000344	0.000153		
	(0.00178)	(0.00183)		
other equity (million USD)	2.95e-08***	3.37e-08***		
	(2.66e-09)	(2.78e-09)		
D2			-0.00104*	-0.000677
			(0.000582)	(0.000605)
other equity + home equity (million USD)			2.94e-08***	3.39e-08***
			(2.58e-09)	(2.68e-09)
income (million USD)	1.47e-07***	2.66e-07***	1.37e-07***	2.57e-07***
	(2.41e-08)	(2.51e-08)	(2.41e-08)	(2.51e-08)
head education	-0.00274*	0.00710***	-0.00314**	0.00683***
	(0.00145)	(0.00145)	(0.00145)	(0.00145)
wife education	0.00186	0.00273**	0.00180	0.00276**
	(0.00131)	(0.00132)	(0.00131)	(0.00131)
age of head	0.00343***	0.00246***	0.00325***	0.00238***
	(0.000431)	(0.000426)	(0.000427)	(0.000423)
age of wife	-0.000260	0.000188	-0.000309	0.000141
	(0.000448)	(0.000447)	(0.000448)	(0.000447)
number of children	0.00552*	0.00276	0.00539*	0.00262
	(0.00286)	(0.00292)	(0.00286)	(0.00292)
age of youngest child	0.000275	0.000450	0.000272	0.000459
	(0.000504)	(0.000525)	(0.000504)	(0.000525)
marriage status	-0.0432***	-0.0126	-0.0433***	-0.0115
	(0.0136)	(0.0138)	(0.0136)	(0.0138)
dummy for year 2007	0.000478	0.00729	3.72e-05	0.00685
	(0.00478)	(0.00511)	(0.00478)	(0.00511)
dummy for year 2009	0.00732	0.00127	0.00851*	0.00445
	(0.00523)	(0.00556)	(0.00488)	(0.00518)
dummy for year 2011	0.00980*	-0.00336	0.0116**	0.000150
	(0.00537)	(0.00567)	(0.00503)	(0.00531)
sexhead	0.0571***	0.0473***	0.0578***	0.0476***
	(0.0109)	(0.0108)	(0.0109)	(0.0108)
white	-0.0149	-0.0707	-0.0170	-0.0723
	(0.0965)	(0.0943)	(0.0965)	(0.0942)
black	-0.0504	-0.126	-0.0502	-0.127
	(0.0967)	(0.0944)	(0.0966)	(0.0944)
native	0.00496	-0.0707	0.00496	-0.0708
	(0.108)	(0.105)	(0.108)	(0.105)
hispanic	-0.0184	-0.0603***	-0.0174	-0.0591***
	(0.0156)	(0.0153)	(0.0156)	(0.0153)
asian	-0.0211	-0.133	-0.0239	-0.134
	(0.101)	(0.0988)	(0.101)	(0.0988)
other	-0.00730	-0.0610	-0.00771	-0.0616
	(0.0989)	(0.0966)	(0.0988)	(0.0966)
Constant	-0.0146	-0.0928	-0.0119	-0.0225
	(0.117)	(0.117)	(0.104)	(0.102)
Observations	18,484	18,484	18,484	18,484
R-squared				
Number of pid	6,765	6,765	6,765	6,765

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 Impact of Exemption Level, Full Observation, Fixed Effect

VARIABLES	(1) self	(2) bus	(3) self	(4) bus
D1	0.000938	0.00526		
	(0.00504)	(0.00569)		
D1 * home equity	3.61e-05	0.000218		
	(0.000165)	(0.000187)		
home equity	-0.000415	-0.00216		
	(0.00192)	(0.00217)		
other equity (million USD)	9.61e-09***	1.45e-08***		
	(2.67e-09)	(3.01e-09)		
D2			-0.000922	6.88e-05
			(0.000588)	(0.000664)
other equity + home equity (million USD)			9.19e-09***	1.46e-08***
			(2.61e-09)	(2.95e-09)
income (million USD)	7.57e-08***	1.30e-07***	7.47e-08***	1.31e-07***
	(2.37e-08)	(2.67e-08)	(2.36e-08)	(2.67e-08)
head education	0.00335	0.00225	0.00325	0.00223
	(0.00284)	(0.00321)	(0.00284)	(0.00321)
wife education	0.00223	4.31e-05	0.00222	0.000107
	(0.00200)	(0.00226)	(0.00200)	(0.00226)
age of head	0.00689	-0.00934	0.00680	-0.00971
	(0.00621)	(0.00701)	(0.00621)	(0.00701)
age of wife	-0.00167**	-5.22e-07	-0.00170**	-2.53e-05
	(0.000707)	(0.000798)	(0.000707)	(0.000798)
number of children	0.00340	0.00714**	0.00322	0.00710**
	(0.00313)	(0.00353)	(0.00312)	(0.00353)
age of youngest child	0.000313	1.08e-05	0.000305	2.10e-05
	(0.000456)	(0.000515)	(0.000456)	(0.000515)
marriage status	0.0395**	0.0324	0.0391**	0.0328
	(0.0193)	(0.0217)	(0.0192)	(0.0217)
dummy for year 2003	0.000817	0.0246	0.000335	0.0253
	(0.0138)	(0.0156)	(0.0138)	(0.0156)
dummy for year 2005	-0.0147	0.0300	-0.0156	0.0314
	(0.0254)	(0.0287)	(0.0254)	(0.0286)
dummy for year 2007	-0.0203	0.0627	-0.0216	0.0647
	(0.0378)	(0.0427)	(0.0378)	(0.0427)
dummy for year 2009	-0.0226	0.0791	-0.0222	0.0842
	(0.0503)	(0.0567)	(0.0501)	(0.0566)
dummy for year 2011	-0.0237	0.0992	-0.0230	0.105
	(0.0627)	(0.0708)	(0.0626)	(0.0707)
Constant	-0.116	0.554**	-0.105	0.615**
	(0.245)	(0.276)	(0.239)	(0.269)
Observations	22,229	22,229	22,229	22,229
R-squared	0.012	0.009	0.013	0.009
Number of families	6,273	6,273	6,273	6,273

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11 Impact of Exemption Level, Pre BAPCPA (2001 – 2003), Fixed Effect

VARIABLES	(1) self	(2) bus	(3) self	(4) bus
D1	-0.0318	-0.0296		
	(0.0366)	(0.0452)		
D1 * home equity	0.000290	0.000101		
	(0.000463)	(0.000572)		
home equity	-0.00406	-0.000102		
	(0.00520)	(0.00642)		
other equity (million USD)	1.02e-08*	7.28e-09		
	(5.27e-09)	(6.50e-09)		
D2			0.000235	0.00110
			(0.00129)	(0.00159)
other equity + home equity (million USD)			1.04e-08**	7.88e-09
			(5.28e-09)	(6.51e-09)
income (million USD)	7.12e-08	-4.90e-08	7.06e-08	-4.70e-08
	(4.84e-08)	(5.98e-08)	(4.84e-08)	(5.97e-08)
head education	-0.00589	-0.00839	-0.00595	-0.00825
	(0.00742)	(0.00916)	(0.00742)	(0.00916)
wife education	0.0146	0.00120	0.0146	0.00148
	(0.0124)	(0.0153)	(0.0124)	(0.0153)
age of head	0.0285**	-0.0247	0.0286**	-0.0246
	(0.0134)	(0.0165)	(0.0134)	(0.0165)
age of wife	-0.00439	-0.00488	-0.00442	-0.00481
	(0.00463)	(0.00572)	(0.00463)	(0.00572)
number of children	-0.00501	-0.00342	-0.00515	-0.00309
	(0.00865)	(0.0107)	(0.00865)	(0.0107)
age of youngest child	4.66e-05	0.000585	5.55e-05	0.000621
	(0.00108)	(0.00133)	(0.00108)	(0.00133)
marriage status	0.0883	0.0273	0.0876	0.0271
	(0.0789)	(0.0974)	(0.0789)	(0.0974)
dummy for year 2003	-0.0411	0.0546	-0.0416	0.0553
	(0.0276)	(0.0340)	(0.0275)	(0.0340)
Constant	-0.821	1.740**	-1.123*	1.467*
	(0.655)	(0.808)	(0.616)	(0.760)
Observations	7,149	7,149	7,149	7,149
R-squared	0.018	0.015	0.018	0.015
Number of pid	4,079	4,079	4,079	4,079

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12 Impact of Exemption Level, Post BAPCPA (2005 – 2011), Fixed Effect

VARIABLES	(1) self	(2) bus	(3) self	(4) bus
D1	-0.000636	0.00822		
	(0.00604)	(0.00646)		
D1 * home equity	-6.53e-05	-5.50e-07		
	(0.000200)	(0.000214)		
home equity	0.000322	-0.00148		
	(0.00235)	(0.00252)		
other equity (million USD)	8.48e-09***	1.12e-08***		
	(3.13e-09)	(3.35e-09)		
D2			-0.000354	0.00151**
			(0.000712)	(0.000762)
other equity + home equity (million USD)			8.31e-09***	1.21e-08***
			(3.12e-09)	(3.34e-09)
income (million USD)	7.63e-08***	1.92e-07***	7.53e-08***	1.91e-07***
	(2.88e-08)	(3.08e-08)	(2.87e-08)	(3.08e-08)
head education	0.00245	0.00255	0.00240	0.00244
	(0.00293)	(0.00313)	(0.00292)	(0.00313)
wife education	0.00427*	0.000182	0.00418*	9.56e-05
	(0.00251)	(0.00268)	(0.00250)	(0.00268)
age of head	0.00179	-0.0155*	0.00179	-0.0155*
	(0.00756)	(0.00809)	(0.00756)	(0.00809)
age of wife	-0.00217**	0.000174	-0.00217**	0.000157
	(0.000966)	(0.00103)	(0.000966)	(0.00103)
number of children	-0.000837	0.00253	-0.000938	0.00243
	(0.00416)	(0.00445)	(0.00416)	(0.00445)
age of youngest child	0.000605	0.000810	0.000605	0.000811
	(0.000596)	(0.000637)	(0.000595)	(0.000637)
marriage status	0.0418*	0.0431*	0.0411*	0.0421*
	(0.0237)	(0.0254)	(0.0237)	(0.0254)
dummy for year 2007	0.00764	0.0464***	0.00721	0.0464***
	(0.0162)	(0.0173)	(0.0162)	(0.0173)
dummy for year 2009	0.0178	0.0751**	0.0177	0.0775**
	(0.0310)	(0.0332)	(0.0310)	(0.0331)
dummy for year 2011	0.0258	0.106**	0.0257	0.109**
	(0.0462)	(0.0494)	(0.0461)	(0.0493)
Constant	-0.0206	0.745**	-0.0275	0.819**
	(0.316)	(0.338)	(0.311)	(0.333)
Observations	18,484	18,484	18,484	18,484
R-squared	0.012	0.011	0.012	0.011
Number of pid	6,765	6,765	6,765	6,765

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13 The Impact of Exemption Level to probability of making incorporated or unincorporated business, Post BAPCPA, using second specification, Fixed Effect.

VARIABLES	(1) Incorporated	(2) Unincorporated
-Log(1+(max(home equity - exemption,0))	0.00151***	0.000656
	(0.000502)	(0.000764)
Home + other equity (million USD)	1.09e-02***	2.03e-02***
	(2.24e-03)	(5.61e-03)
Income (million USD)	1.09e-01***	2.64e-01***
	(2.60e-02)	(5.72e-02)
Head education	0.00106	0.00121
	(0.00204)	(0.00313)
Wife education	0.00346**	-0.00299
	(0.00171)	(0.00260)
Age of head	-0.00363	-0.0130
	(0.00531)	(0.00813)
Age of wife	-0.00113*	0.00124
	(0.000660)	(0.00102)
Number of children	0.00724**	-0.00116
	(0.00284)	(0.00433)
Age of youngest children	4.24e-05	0.000985
	(0.000407)	(0.000617)
Marital	0.00483	0.0470*
	(0.0161)	(0.0245)
Dummy for year 2007	0.0163	0.0325*
	(0.0114)	(0.0174)
Dummy for year 2009	0.0282	0.0544
	(0.0217)	(0.0333)
Dummy for year 2011	0.0309	0.0828*
	(0.0324)	(0.0496)
Constant	0.296	0.636*
	(0.216)	(0.333)
Observations	15,815	16,300
R-squared	0.014	0.011
Number of pid	6,226	6,246

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1