

# An Analysis of the Personal Bankruptcy Decisions in Korea

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## *Abstract*

*Although the soundness of household debt in Korea appears to be inferior to that in the advanced economies, the number of personal bankruptcy filings seems to be much less than would otherwise be the case considering the size of the population and economy. This implies that only limited recourse is had to personal bankruptcy in Korea and points to the existence of a number of what are for all intents and purposes individual bankruptcies in Korea for which no applications are filed. This paper analyses the reason for this and estimates the size of such informal bankruptcies using data on debtors who have a history of bad credit and on personal bankruptcy filings. Analysing household bankruptcy decisions, we try to answer the reason for the recent dramatic increase in personal bankruptcy filings and offer some policy implications concerning this situation.*

*This paper suggests that personal bankruptcy decisions involve three phases: default, informal bankruptcy, and filing. It has been suggested that the major factors affecting personal bankruptcy decisions include adverse events such as illness and unemployment; financial benefits, option value, and opportunity costs from filing; and the law on the garnishment of earnings. The empirical results show that the probability of filing for bankruptcy is likely to increase in line with the financial benefits and after debtors experience an income shock.*

*Based on these results, firstly, we argue that the government needs to help the poor accumulate financial assets as a buffer against income shocks. Correspondingly, the processing of filings and adjudications of bankruptcy in the court should be applied less restrictively to debtors who have actually lost their repayment capacity. Secondly, financial education should be provided for the poor to prevent debtors from falling into the status of informal bankruptcy. Lastly, considering the strategic behavior of debtors, caution should be exercised in changing legislation concerning personal bankruptcy in the future.*

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Key-words: personal bankruptcy, informal bankruptcy, financial benefit

## I. Introduction

The Korean household debt problem that erupted between 2002 and 2003 appears to have been alleviated to some extent in the last few years. This observation is supported by the recent improvement in indicators representing the degree of financial soundness of the household sector.<sup>1)</sup> Nevertheless, the number of personal bankruptcy filings has been rising very rapidly and it is thus possible that the household debt and credit defaulter problems may translate into personal bankruptcy problems. According to the U.S. Congressional Budget Office (2000), for example, bankruptcy filings generally lag the ratio of debt to income with a time lag of 1.5 years and the rate of interest payments with a time lag of 1 year. This suggests that the surge in household debts in 2002 might have had an impact on the sudden increase in the number of filings for personal bankruptcy after 2003 in Korea.

This paper attempts to increase an understanding of the recent dramatic increase in individual bankruptcy filings through an analysis of major factors affecting personal bankruptcy decisions and to find policy measures to eliminate such a phenomenon. In particular, considering a large number of credit defaulters and large household debts, it seems that informal bankruptcy should be considered in order to appreciate the situation. This paper thus systematically analyzes the size and the cause of informal bankruptcy and attempts to find measures to prevent expansion of the personal bankruptcy problems in Korea by way of an economic analysis of the factors affecting personal bankruptcy decisions.

The difference between existing studies and this paper is tripartite. First, the literature on personal bankruptcy has been heavily focused on either sociological or legal analysis, whereas this paper attempts an economic analysis of it by taking

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1) Such factors as a gradual decrease in the number of credit defaulters, a continuous decline in the arrears rate of bank loans, and a sharp rally in private savings suggest that households' capacity has recovered to some extent. Refer to Financial Stability Report published by the Bank of Korea in June, 2005 for details.

into account the likelihood of individuals' strategic behaviors. Second, this paper, unlike most existing theories of bankruptcy, examines the causes of bankruptcy by introducing an additional concept called "informal bankruptcy" to reflect more appropriately the current situation in Korea. Third, existing discussions are mostly focused on a descriptive analysis of bankruptcy, whereas this paper breaks new ground by analysing empirically the factors that affect personal bankruptcy decisions using the data on personal bankruptcy filings in Korea .

This paper is organized as follows. Section II surveys the studies in various academic fields concerning the current status of personal bankruptcy in Korea and personal bankruptcy. Section III indirectly estimates the scale of informal bankruptcy using the data on debtors who have a history of bad credit and analyzes the causes. Section IV arranges the major factors of personal bankruptcy decisions through a review of the literature and empirically analyzes some of them using the data on debtors who have a history of bad credit and on personal bankruptcy filings. Section V briefly summarizes the policy implications based on the theories and empirical results of Sections III and IV and concludes the paper.

## II. Personal Bankruptcy in Korea and Literature Review

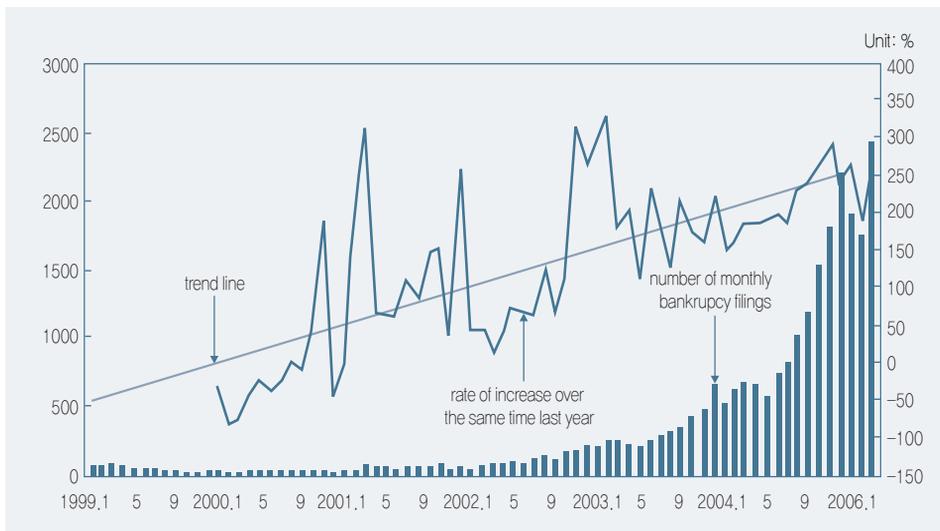
### 1. Current Status of Personal Bankruptcy in Korea

The personal bankruptcy system introduced in Korea in 1962 had been utilized in a limited way, receiving its first applicant only in 1997 but the number of personal bankruptcy filings increased rapidly after 2003 due to the personal debt and credit defaulter problems. In the next couple of years, personal bankruptcy filings increased by 3.2 times from 3,856 in 2003 to 12,317 in 2004; filings submitted by the end of December, 2005 were 38,773 which represented 3.1 times the number submitted by around the same the previous year. This strong expansionary trend can be confirmed by examining their monthly growth rates as well; the rate of increase in personal bankruptcy filings, as shown in Figure 1, rose to 300% that in the same month of the preceding year. This appears to be due to a sharp increase in the number of credit defaulters between 2002 and 2003, as shown in Table 1.<sup>2)</sup>

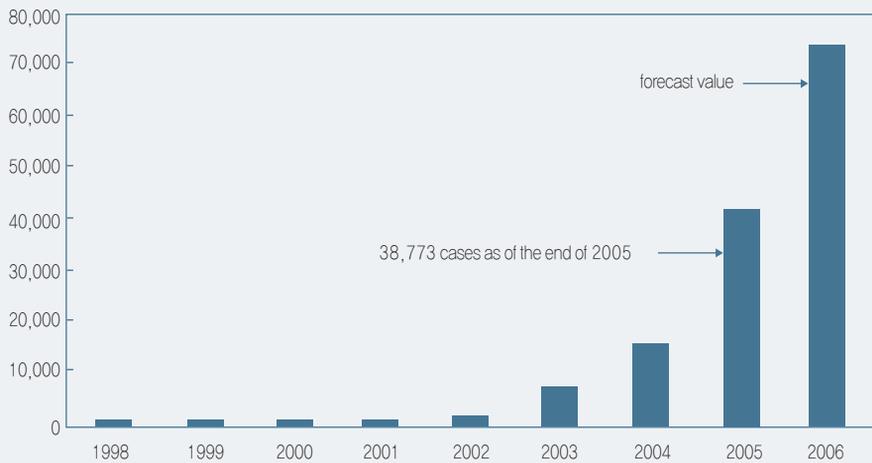
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2) See Kim et al. (2004).

Although the soundness of household debt in Korea appears to be below that in the advanced economies, the number of personal bankruptcy filings seems to be much less than it would otherwise be, considering the size of the population and economy. As shown in Table 2, the number of individual bankruptcy filings in Korea has been low compared to that in the U.S. and Japan despite the fact that the financial debt to disposable income ratio or the ratio of interest payable, which represents the degree of financial burden borne by households, is greater than that in those countries. The international comparison of personal bankruptcy filings per 10,000 persons presented in Figure 2 shows that almost no one filed for bankruptcy over the 1998-2003 period, compared to 7 persons in Britain, 19 in Japan, and 56 in the United States. In particular, the capital gearing ratio of the Korean household sector turned out to be 49.3% as of the end of June, 2005 and this figure is more than 20 percentage points greater than that in the United States and Great Britain.<sup>3)</sup> This suggests that the Korean household sector is more vulnerable to external or interest rate shocks than that of advanced countries.

**Figure 1****Trend of monthly and annual personal bankruptcy filings**

3) Bank of Korea, Financial Stability Report, October 2005.



Note : The estimate for 2006 is computed using the average rate of an increase in the number of monthly bankruptcy applicants.

Source: Office of Court Administration (2006)

**Table 1** Trend of personal bankruptcy filings relative to credit defaulters

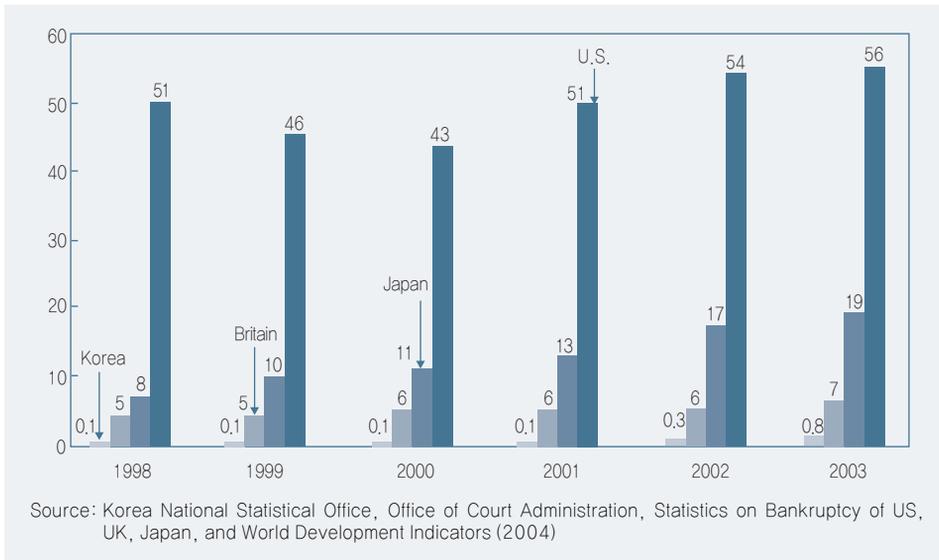
	(unit: number of persons)					
	1999	2000	2001	2002	2003	2004
Credit Defaulters (A)	1,996,000	2,084,000	2,450,000	2,636,000	3,720,000	3,615,000
Personal Bankruptcies (B)	505	329	672	1,335	3,856	12,317
B/A(%)	0.025	0.016	0.027	0.051	0.104	0.341

Source: Korea Federation of Banks and Office of Court Administration

**Table 2** International comparison of personal bankruptcy and the size of economy

	(Korea=1, 2003)		
	The United States	Japan	Great Britain
GDP	18.1	7.1	3.0
Per capita GNI	3.0	2.7	2.4
Debt/Disposable Income	0.9	1.0	-
Interest/Disposable Income	0.7	0.5	-
Number of Applications for Bankruptcy	300	63	10

Source: Bank of Korea, Office of Court Administration, Statistics on Bankruptcy of US, UK, Japan, and World Development Indicator (2004)

**Figure 2** Number of Personal Bankruptcy Filings per 10,000 persons

Compared to other major advanced countries, only limited recourse is had to personal bankruptcy in Korea due to social and institutional factors in addition to economic factors, and this points to the existence of a considerable number of what are not nominally but effectively personal bankruptcies in Korea.

## 2. Literature Review

The existing studies on bankruptcy have mainly been undertaken in the fields of law, sociology, and consumer studies, and the details of research are mostly confined to a description of the bankruptcy system itself or to an introduction and a comparison of the foreign institutions concerning the application of laws. There has thus been a lack of economic analysis on factors affecting personal bankruptcy decisions.

Academic views on personal bankruptcy followed two main strands. First, legal and sociological studies recognize bankruptcy as a last resort utilized in economic situations where all other options are ruled out. On the other hand, economists recognize it as an individual's rational economic conduct seeking to maximize his/her utility; and accordingly says they see it as a strategical behavior based on cost-benefit analysis.

Sociological and legal studies on personal bankruptcy view bankruptcy systems as insurance against adverse events such as disease, unemployment and

divorce, and emphasize their function as a social safety net. Through a descriptive analysis of a sample of bankruptcy applicants in the 1980s, Sullivan et al. (1989) argue that individuals file for bankruptcy because they become unable to honor their financial obligations due to the advent of unexpected adverse events; and it appears that such a view is accepted by most of the media.<sup>5</sup>) At the end of the day, they regard more uncertain and riskier economic circumstances as the major cause of sudden increases in personal bankruptcy. In particular, they assert that the aggressive business strategies pursued by providers of consumer finance such as banks and credit card companies have greatly contributed to it.

As the number of personal bankruptcies skyrocketed in the United States beginning from the second half of the 1990s, the researchers in economics began to show great interest in bankruptcy issues. Most of these economists point to the easing of bankruptcy laws and the reduced social stigma associated with it as the major cause of the hike in bankruptcy filings. Many of the studies undertaken in the United States regarding personal bankruptcy focused chiefly on the relaxation of bankruptcy laws, and the expanding effects of bankruptcy exemptions in particular, but consistent empirical findings as to how far this contributed to the increase in personal bankruptcy filings have not yet been presented (Congressional Budget Office, 2000).

Rea (1984) and Boyes and Faith (1986) analyze the economic benefits created by the Bankruptcy Reform Act of 1978, and Gross and Souleles (2002) identify the deregulation of the Bankruptcy Act and the reduction in the social stigma of bankruptcy as the major cause of the sharp increase in personal bankruptcy filings during the expansion of the U.S. economy. The existing economic approach, however, cannot be used for analyzing the major factors affecting bankruptcy decisions since they depend on psychological phenomena such as social stigma.

In recent years, it has been pointed out that individuals consider the financial benefits and costs arising from filing when deciding whether to apply for bankruptcy. Fay, Hurst and White (2002) empirically examine the validity of the Learning Theory and the Adverse Event Hypothesis, using the household data gathered from the Panel Study of Income Dynamics (PSID). According to their studies, personal bankruptcy decisions are affected by net financial benefits, rather than by the loss of repayment capacity due to such income shocks as unemployment and illness, and therefore bankruptcy decisions are derived from

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4) The Washington Post asserted in an editorial (Feb. 18, 2000) that the United States should provide bankrupts a second chance since most bankruptcies arise from adverse factors such as illness, unemployment, and divorce.

individuals' strategic behaviors.

In addition, Dawsey and Ausubel (2001) and White (1998) attempt to increase the explanatory power of the model designed to study factors affecting personal bankruptcy decisions by introducing the concept of informal bankruptcy, rather than employing the existing model divided into bankruptcy and repayment, and by classifying the determination process of bankruptcy into three phases: default, informal bankruptcy, and filing. According to Dawsey and Ausubel (2001) and a VISA survey (1997), more than 60% of the bad debt expenses of credit card companies in the United States were due to losses other than bankruptcy, and this provides indirect evidence showing that the existence of a considerable number of informal bankrupts in the U.S. economy. In addition, using the 1992 Survey of Consumer Finance, White (1998) reports that only about 1% of U.S. households actually file for bankruptcy under the current bankruptcy system while at least 15% of them are in informal bankruptcy.

Moreover, White (1998) and Long (2001) point out that a considerable number of debtors are still in informal bankruptcy because creditors have become more lenient about collecting their debts or they were not able to collect small debts, and because of the various economic factors such as large option value and high opportunity cost that could arise as a consequence of bankruptcy.

### III. Informal Bankruptcy: Scale and Its Causes

#### 1. *Estimating the Scale of Informal Bankruptcy*

As previously mentioned, an informal bankrupt is defined as a debtor who is essentially in a state of bankruptcy (insolvency) but does not file for bankruptcy. In this paper, however, it is rather a theoretical concept, irrespective of his/her repayment capability. That is, informal bankruptcy is defined as the state in which an individual has not filed bankruptcy in spite of the fact that they are highly likely to file one because its financial benefits exceeds financial costs. It has been reported that there are considerable number of informal bankrupts in the United States. On the other hand, net benefit used to identify the state of informal bankruptcy is defined as the difference between its benefits (exempt debt upon bankruptcy) and costs<sup>5)</sup> (nonexempt assets, filing costs, etc).

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5) Personal bankruptcy costs can be broadly defined by including opportunity cost and option value in addition to its accounting cost.

Considering a large number of credit defaulters in Korea, the new approach taking informal bankruptcy into account appears to better reflect the reality compared to the existing approach.

The estimation results for the size of informal bankruptcy in Korea obtained using the data on credit defaulters show that there are approximately 430,000 to 790,000 informal bankrupts in Korea. According to a survey conducted by the Ministry of Finance and Economy,<sup>6)</sup> 12% to 22% of the respondents replied that they are unable to honor their financial obligations and it can thus be deduced that a total of approximately 430,000 to 790,000 persons are effectively in a condition of bankruptcy.<sup>7)8)</sup>

It is estimated that 4% of the total credit defaulters appear to be candidates for bankruptcy. In other words, based on the 2005 report on financial default,<sup>9)</sup> it is estimated that approximately 140,000 of 310,000 credit defaulters (155,000 credit defaulters out of the total beneficiaries of the National Basic Livelihood Security System and 153,000 self-employed) are in the state of bankruptcy.<sup>10)</sup>

This kind of indirect and arbitrary estimation definitely has a limitation but it can be confirmed that the number of informal bankrupts is greater than that of actual bankruptcy filings,<sup>11)</sup> and the former seems to play a role of 'reservoir' enabling the continuous increase in the number of personal bankruptcy filings in Korea.

## 2. Causes of Informal Bankruptcy

In the case of Korea, the reasons for the relatively large number of informal bankrupts despite the small number of actual bankruptcy filings are as follows:

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- 6) Only 19% of the respondents are estimated to be capable of repaying their debts and 12% of those who are unable to repay their debts after debt readjustment are assumed to be informal bankrupts. (Ministry of Finance and Economy, "The Current Status of Credit Defaulters and Policy Measures," Press Release, March 2004)
  - 7) The sample size is 3,610,000 credit defaulters as of the end of December, 2004. Even if it is assumed that individuals save more than 50% of their income, the size of informal bankruptcy rises to 790,000 if 22% of those who responded that it would take more than 8 years to repay are assumed to be in a state of informal bankruptcy.
  - 8) Since this estimation method may cause a problem in that the upper value of the number of informal bankrupts is arbitrarily estimated, the confidence interval for the ratio of borrowers' unsustainable debt can be utilized to estimate the size of informal bankruptcy. Considering the fact that the standard deviation is  $\pm 1.57\%$  points given that the confidence interval is 95%, the size of informal bankruptcy in Korea is estimated to be somewhere between 380,000 and 470,000 persons.
  - 9) Of those who benefit from the National Basic Livelihood Security System, 77.3% replied that they were unable to repay their debts and 9.6% of the self-employed claimed to have lost their repayment capacity; these two classes of individuals are assumed to be informal bankrupts. (Ministry of Finance and Economy and Financial Supervisory Service, "Debt Relief Plan for Financial Defaulters," Press Release, Feb. 2005).
  - 10) It turns out that 111,881 of the 310,000 defaulters had applied for debt readjustment and most of them are estimated to be in a state of informal bankruptcy.
  - 11) The scale of informal bankruptcy is estimated to be 36 to 65 times greater than that in 2004.

first, the economic and social costs of bankruptcy are high while its benefits are small; second, the cost of informal bankruptcy is relatively low; and third, debtors may form an expectation that their liabilities will be written off.

First, bankruptcy costs such as legal costs, the barring of future access to credit, loss of profession, job search difficulties and social stigma appear to impose substantial burden on bankruptcy filers. The record of bankruptcy lasts longer than that of arrears due to informal bankruptcy<sup>12)</sup> and affects individuals' financial and economic activities. In particular, direct bankruptcy costs consist of liquidation and legal costs, and these costs<sup>13)</sup> impose a burden on bankruptcy filers facing a critical situation.

In addition, the feasibility of collection and the likely costs of informal bankruptcy is low due to the generous laws governing garnishment and exemptions. In the case of the U.S., creditors can garnish debtors' wages but 75% of the wages are protected by federal law. Moreover, non-exempt assets can only be liquidated after the court has announced its ruling. In Korea, meanwhile, a system of automatic garnishment of wages has been put in place under the recently amended garnishment laws, with the provisional attachment of debtors' wages of less than the minimum living expenses (US \$1,200) for a household made up of four members being prohibited.

From the policy aspect, it appears that the long-lasting policy uncertainty concerning credit defaulters has acted to strengthen debtors' expectations about debt remission and accordingly raised the number of informal bankrupts.

From a macroeconomic point of view, meanwhile, the increase in the number of informal bankrupts in Korea is seen to be due largely to a massive surge in household debt from the end of 2001 to the beginning of 2003. The number of credit defaulters increased as the growth rate of household liabilities was running well above its appropriate pace around the period<sup>14)</sup> and it appears that the increase in the scale of informal bankruptcy was due to their persistent inability to discharge their debts.

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12) Bankruptcy records are kept for seven years whereas records of bad debts written off are generally deleted after five years.

13) In the case of Korea, bankruptcy and exemption costs cannot be uniformly measured but it is generally known that they include procedural costs (about US \$ 300-600) such as commission, transmittal fee, charges for newspaper announcements plus legal fees of approximately US \$1,000-2,000.

14) See Yoo (2005) and Choi *et al.* (2004) for more detailed discussions on an appropriate level of debt and see Kim *et al.* (2004) concerning the reasons for the rapid increase in the number of credit defaulters.

## IV. Empirical Analysis of personal Bankruptcy Decision

### 1. Determinants of Personal Bankruptcy

Personal bankruptcy decisions generally involve three phases: default, informal bankruptcy and filing, and it is suggested that the following four factors are the major ones affecting personal bankruptcy decisions.

#### 1) Adverse Event

Considering the fact that the ability to repay can decrease by a large extent if income declines or expenditure increases due to such factors as unexpected illness or disaster, unemployment or divorce, these shocks to income and expenditure act as major factors affecting personal bankruptcy decisions. In this case, income, representing a person's ability to repay his/her debts, would appear to be negatively correlated with the probability of bankruptcy in a regression equation.

#### 2) Financial Benefit

Households are more likely to file for bankruptcy as its financial benefits increase, and following Fay, Hurst, and White (2002), these are defined as follows:

$$FinBen_{it} = \max[D_{it} - \max[W_{it} - E_{it}, 0], 0] \quad (1)$$

where  $D_{it}$  is the amount of debt held by individual  $i$  at time  $t$ ,  $W_{it}$  is wealth held by individual  $i$  at time  $t$ , and  $E_{it}$  is the size of exempt assets upon bankruptcy.

If  $W_{it}$  exceeded  $E_{it}$  upon bankruptcy, the debt,  $D_{it}$ , would be exempt from repayment and  $W_{it} - E_{it}$  would be liquidated. This variable,  $Fin Ben_{it}$ , would act as a major factor affecting individual bankruptcy decisions. For example, if  $D_{it}$ ,  $W_{it}$ , and  $E_{it}$  were 150, 100, and 50, respectively, then  $Fin Ben_{it}$  would be 100, whereas if  $E_{it}$  increased to 150, *ceteris paribus*, then  $Fin Ben_{it}$  would be 150, and as a result the amount of financial benefits received by debtors would increase according to the level of their exempt assets.

Consequently, the variable representing financial benefits is positively correlated with the likelihood of bankruptcy filing. This suggests that individuals behave strategically in that they first establish their reservation value for bankruptcy prior to filing for bankruptcy and then they file only if the bankruptcy costs exceed it.

### 3) Option Value and Opportunity Cost of Bankruptcy

In deciding whether to file for bankruptcy, individuals consider present benefits and costs as well as the option value and opportunity costs arising from bankruptcy, and this assertion can be elucidated on the basis of a discrete time model of personal bankruptcy filing designed by Long (2001). According to the model, a risk-neutral individual avoids filing for bankruptcy in the present period because its net present value becomes smaller in the current period than that in the next period if new information is available in the next period. Hence, bankruptcy gains option value due to the flexibility of being able to make a decision in the next period, given that the decision is irreversible. In addition, when economic prospects become uncertain or the uncertainty inherent in bankruptcy-related policies or systems is on the rise, individuals are more likely to choose to remain in a state of informal bankruptcy, rather than to file for bankruptcy as the option value of bankruptcy increases.

### 4) Garnishment Laws

If garnishment regulations and arrangements such as provisional seizure were to be tightened, there is an increased probability that informal bankruptcy would turn into formal filing for bankruptcy as this would become a more attractive option. A model of bankruptcy<sup>15)</sup> which considers the creditor's decision-making concerning provisional seizure shows that the creditor's behavior in collecting his/her debts and the arrangements for provisional seizure may affect the transition from informal bankruptcy to filing for bankruptcy.

The debtor has to choose between payment and arrears in the model and if he/she goes into arrears, then he/she would have to choose informal bankruptcy, bankruptcy or deferred payment at the next stage and garnishment laws will affect his/her decision-making at this stage. On the other hand, provisional seizure of assets<sup>16)</sup> shifts debtors from default to repayment but at the same time it directs them from a state of informal bankruptcy to that of actively filing for bankruptcy. Furthermore, its extent and intensity are important for them in making decisions about filing and informal bankruptcy since they can avoid provisional enforcement of claims by creditors through bankruptcy filing.

Accordingly, if it were not possible for creditors to enforce their claims against credit delinquents, then informal bankruptcy would be at equilibrium with

15) Refer to White(1998) for more detailed discussions.

16) According to the law, creditors can seize a certain fraction of debtors' intangible assets such as wages and bank deposits or draw on them directly from their employers or banks.

bankruptcy in this same model. That is, debtors would choose to remain in a state of informal bankruptcy rather than to file for bankruptcy if creditors become lenient in collecting their debts or it became impossible for them to do so in practice. On the other hand, *ceteris paribus*, the greater the number of creditors the more likely debtors are to choose bankruptcy.

## 2. Estimation Results

In this paper, the major factors affecting personal bankruptcy decisions are estimated on the basis of a probit analysis, following Fay, Hurst, and White (2002).<sup>17)</sup> It is found that they are affected by demographic factors such as age, gender, marital status, number of children; educational level, house ownership status, income level; and adverse events such as illness, unemployment, divorce, etc. The regression equation reflecting these can be expressed as follows:

$$B_{it} = F(\text{FinBen}_{it}, A_{it}, Z_{it}, I_{it}) \quad (2)$$

where  $B = 1$  if bankruptcy is filed for or 0 otherwise, *FinBen* represents the financial benefit (liabilities - assets) from filing for bankruptcy<sup>18)</sup>, *A* is a dummy variable representing financial difficulty due to illness, *Z* represents age, gender, household size, education level, self-employment and divorce, and *I* represents income and expenditure.

The data<sup>19)</sup> on bankrupts used in this paper are compiled on the basis of such records as bankruptcy application forms, personal statements, proof of debt, and household balance sheets. The individual-level data are from the Korea Labour Institute. The use of the integrated data may produce biased results due to the violation of random sampling. Considering the fact that the use of data on personal bankruptcy imposes a limitation on analysis due to small sample size,<sup>20)</sup> the method utilized in this paper can be viewed as an alternative.<sup>21)</sup>

17) The analytical difference between Fay, Hurst, White (2002) and this paper are twofold. First, the former analyzes households whereas the latter studies individuals. Second, the coverage of financial benefits varies due to the existence of legal disparities between the respective bankruptcy laws. These divergences prompted the use of different variables.

18) The variable,  $B$ , has been modified to meet the current situation in Korea. This is because there is no clause in the Korean law concerning real estate that is the individual's place of residence, which is exempt from liquidation. However, since the existence of a difference between the financial benefits for individuals arise from differences between personal liabilities and nonexempt assets, it seems that the exclusion of this factor should not change the outcome.

19) The 2004 Report on Personal Bankruptcy, Seoul Shinmun. The period of analysis is from May 2002 to June 2004 and the sample size is 306.

Firstly, an analysis on the characteristics of bankrupts with the use of data on 306 bankrupts shows that their average age turns out to be 37.8 years and most of them are in their 30s and 40s. It is found that bankruptcy filers had, on average, 6.6 credit cards and had used them for about 6.3 years, on average; they had participated in economic activities for 7.4 years, on average. In addition, the

**Table 3** Summary Statistics

Name of Variable	Number of Observations	Mean	Standard Error	Min	Max
Bankruptcy (Yes=1)	4690	0.0043	0.0651	0	1
Financial Benefit (10,000 won)	4690	4899.5	7734.8	0	49000
(Financial Benefit) <sup>2</sup>	4690	8.37*10 <sup>7</sup>	2.5*10 <sup>8</sup>	0	2.40*10 <sup>9</sup>
Level of Education (1=Preschool, 2=Illiteracy, 3=Elementary School, 4=Middle School, 5=High School, 6=College, 7=University, 8=Master, 9=Ph.D.)	4690	4.97	1.42	1	9
Age (in years)	4690	40.28	14.1	17	69
Age <sup>2</sup>	4690	1822.6	1190.5	289	4761
Gender (Male=1, Female=2)	4690	1.51	0.4999	1	2
Self-employed (Yes=1)	4690	0.1571	0.3639	0	1
Own Vehicle (Yes=1)	4690	0.684	0.4650	0	1
Divorce (Yes=1)	4690	0.023	0.1500	0	1
Size of Household (number of persons)	4690	3.824	1.1827	1	8
Monthly Average of Household Expenditure (10,000 won)	4677	145.9	85.6	10	1000
Average monthly household income (10,000 won)	4314	208	147.5	0	1800
Illness Shock (Yes=1)	4689	0.027	0.1610	0	1

Source: The Fifth Korean Labor and Income Panel Study(KLIPS) and 2004 Personal Bankruptcy Report.

- 20) In contrast to the United States where active recourse is had to the bankruptcy system, persons filing for bankruptcy account for less than 0.03% of its total population in Korea. It is thus highly likely that the general sampling method excludes data on bankrupt households. This is, for example, very similar to the small sample problem occurring in the sampling of household income and assets held by those in high income brackets.
- 21) In general, survey data, which include sufficient data on personal bankruptcy, are difficult to gather. In the case of surveys that includes questions concerning bankrupts, the actual number of bankruptcy filings is so small that the sample may not a representative of the population. It has also been pointed out that the data employed by Fay, Hurst and White (2002) may cause downward bias due to small sample size.

amount of debt turns out to be about 145 million won, on average, and there were 12.3 creditor financial institutions (including individual creditors) per person.

Table 3 presents basic statistics for major variables employed in the analysis. The variable representing individual bankruptcy includes 20 bankruptcy filers whose data are available among total 1,335 filers<sup>22)</sup> during the period and the object of comparison is those aged 15-65 of the individuals surveyed for the fifth KLIPS and those 4,670 individuals whose debts are greater than or equal to assets.<sup>23)</sup> Overall, it is found that individuals' financial benefits are, on average, 48,990,000 won and they are high school graduates. It also turns out that their average age is 40 and 16% of them are self-employed. Their household size appears to comprise 4 persons and about 3% of them have experienced an income shock due to illness over the last year.

Table 4 shows the estimation results for the major factors affecting personal bankruptcy decisions. It appears that the probability of filing for bankruptcy rises as financial benefit increases, implying that the level of net debt exempt from repayment is an important factor affecting personal bankruptcy decisions. In addition, financial benefit and the likelihood of bankruptcy appear to be nonlinearly related and this implies that the latter increase until the size of net debt reaches a certain level.<sup>24)</sup> In light of the fact that the probability distribution of bankruptcy takes the form of an inverted U-shaped curve when the size of net debt increases, the results suggest that some households are in the state of informal bankruptcy. These empirical results thus suggest that personal bankruptcy decisions are affected not only by exogenous income shocks but by individuals' strategic behaviors taking into account benefits and costs from filing.

On the one hand, the variable representing the repayment ability turns out to be negatively correlated with the probability of bankruptcy, and this implies that income shocks such as low income, unemployment or illness act to increase the latter. In addition, the estimation results of the probit model show that the likelihood of bankruptcy tends to rise when unexpected adverse events such as

22) Of the total of 306 filings utilized in this paper, 20, 93 and 193 are from 2002, 2003 and 2004, respectively. The 20 applications submitted in 2002 are first employed for comparison purposes. In this case, the ratio of bankruptcy filings to the object of comparison is 0.4% and this is much greater than 0.001%, the ratio of bankruptcy filings to economically active population.

23) This paper employs the data on bankruptcy filers but the estimation results may vary according to observation because the data size is too small. An analysis through a random draw of 10, 20, 50, 100, 200, and 300 samples out of the 306 applications produces similar results.

24) The size of net debt maximizing the probability of filing is found to be approximately 2 million won. If financial benefit is denoted as  $x$ , then the regression takes the following functional form:  $-0.0004x^2+0.0162x$  and its root is 20.25.

illness affecting one's repayment ability break out, and this is contradictory to the results obtained by Fay et al. (2002).<sup>25)</sup> This suggests that the process and adjudications of bankruptcy in the court have to be applied more liberally to those debtors who have lost their repayment capacity as it turns out that income shocks, such as illness and unemployment, act as major determinants for bankruptcy in Korea.<sup>26)</sup>

**Table 4** Estimation Results for the Determinants of Bankruptcy

Variable	Probit 1	Probit 2
Financial Benefit	0.0011*** (0.0003)	0.0011*** (0.0002)
(Financial Benefit) <sup>2</sup>	-0.0616*** (0.0184)	-0.0601*** (0.0172)
Education Level	-1.3215*** (0.3000)	-1.3103*** (0.2853)
Age	0.0920 (0.0930)	0.0626 (0.1003)
(Age) <sup>2</sup>	-0.0015* (0.0013)	-0.0013* (0.0011)
Gender	0.4274 (0.3838)	0.3937 (0.3606)
Self-employed	0.7197 (0.4770)	0.7815 (0.5037)
Own Vehicle	-0.6673*** (0.1847)	-0.6718*** (0.1876)
Divorce	0.5387** (0.1245)	0.5562*** (0.1235)
Household Size	-0.6672*** (0.1847)	-0.6718*** (0.1876)
Household Expenditure	0.0039 (0.0040)	0.0037 (0.0044)
Household Income	-0.0058* (0.0030)	-0.0062* (0.0033)
Illness		1.4959*** (0.4152)
Constant	1.9853 (2.0768)	2.6503 (2.1498)
Number of Observations	4301	4301

Notes: 1) \*, \*\*, \*\*\* are statistically significant at the 10%, 5%, and 1% levels, respectively.

2) Heteroscedasticity robust standard errors are in parentheses.

3) For the case of financial benefits, the values divided by 1000 are used.

25) In the case of the United States, it is found that income shock does not have an impact on bankruptcy decisions but the variable representing financial benefit is statistically significant.

26) According to the estimation results for the size of informal bankruptcy presented in Section III, the number of candidates for bankruptcy amounts to about 140,000 and it is approximately 12 times greater than that of personal bankruptcy filers in 2004.

The probability of bankruptcy appears to be greater for those who do not own houses, those who have small family and those who are divorced, and it has a nonlinear relationship in the form of an inverted U-shaped with age. It also turns out that holding everything else constant, the lower the level of education of individuals, the more likely they are to file bankruptcy, suggesting that various economic education concerning the personal finance should be provided publicly.<sup>27)</sup> Moreover, individual debtors are most likely to file bankruptcy when they reach their 30s and 40s, and thus it appears to be needed to find measures to help them escape from the status of informal bankruptcy and return to their normal economic activities.

### 3. Creditors' Dilemma Model

A creditor's dilemma model is similar to a Prisoner's dilemma model and can be illustrated by a simple pay-off matrix presented below. Table 5 shows that there arises an inefficient situation in which the creditors make a decision of collection and provisional seizure for debtors, although it is optimal for the former to work-out the latter.<sup>28)</sup>

Table 5		Creditors' Dilemma	
		Creditor 1	
		work-out	collection/provisional seizure
Creditor 2	work-out	(10, 10)	(0, 15)
	collection/provisional seizure	(15, 0)	(5, 5)

What the Creditor's dilemma suggests is that although the work-out makes the debtors to repay more than they would otherwise pay through bankruptcy, individual financial companies seize the debtors' wages provisionally and reinforce collection efforts to prioritize debts, and thereby increase the probability of the debtors' filing of bankruptcy by causing negative externality. Thus it can be seen that the Creditor's dilemma model shows a creditor-side

27) The variables such as education level, divorce, and household size can be viewed as a proxy for social stigma and the results obtained in this paper appear to support the hypothesis to some extent.

28) This situation has in fact occurred many times in the U.S. and this can be inferred from the following remark made by a U.S. judge:

"There is no incentive for creditors to work things out. The rewards go to the meanest son of a bitch in the valley. They get paid first." Judge Lief Clark, quoted in USA Today, Nov. 20, 1998.

factor that can be easily overlooked in analyzing the factors that affect personal bankruptcy.

In this section, it is empirically examined whether the number of creditors affects debtors' transition from informal bankruptcy to bankruptcy. For 306 persons out of the total filers between May 2002 and June 2004, this paper analyzes the major factors affecting personal bankruptcy decisions by setting up the period from which they reported they are uncertain about repayment to which they actually filed bankruptcy as the period of informal bankruptcy.<sup>29)</sup>

It is also examined whether creditor's strategic behaviors affect debtors' bankruptcy decisions, as suggested by the creditors' dilemma model. That is, *ceteris paribus*, the debtors carry out their filings for bankruptcy more rapidly due to debt collection pressure as the number of creditors increases, and in this case it can be expected that the number of creditors is negatively related with the period of informal bankruptcy.

Particular attention should be paid to interpreting the results because the number of observations for the data on bankruptcy is relatively small and the method of analysis is simple, but the greater the number of creditors, the shorter the period during which an individual turns him/herself from the status of informal bankruptcy to that of bankruptcy, as can be seen from the pooled OLS results. Hence, the results appear to suggest that it is more likely that debtors choose to move from the status of informal bankruptcy to that of bankruptcy as collection pressure increases. In addition, Table 6 shows that the higher the debt and education levels, the longer the period during which an individual is informally bankrupt. It also turns out that the period shortens even with his/her repayment efforts.

Overall, the estimation results suggest that in the case of Korea where there are many multi-debtors, financial firms may create inefficiency by increasing bankruptcy filings through competition to enforce their claims rather offering debtors the opportunity for debt readjustment.

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29) It appears from the data that they have taken advantage of credit card discounts, particularly since 2000 when the Korean government took steps to actively promote the use of credit cards, each debtor having held four to five credit cards for a minimum of three months and a maximum of seven years.

**Table 6** Estimation results of the determinants for informal bankruptcy duration

	Period of Informal Bankruptcy
Gender (Male=0, Female=1)	2.0395 (1.4557)
Age	0.1169 (0.0821)
Level of Education	1.5077** (0.6172)
Size of Household	-0.8974 (0.6002)
Bankruptcy Cost	-2.2411 (1.393)
Redemption Efforts	-4.5188*** (1.4002)
ln(Debt Level)	3.8404** (1.4920)
Number of Creditors	-0.2991** (0.1447)
Constant	-28.137** (12.614)
Number of Observations	179

Notes: 1) \*, \*\*, \*\*\* are statistically significant at the 10%, 5%, and 1% levels, respectively.

2) Heteroskedasticity robust standard errors are in parentheses.

3) The informal bankruptcy duration is defined as the period from when a bankruptcy filer start to feel uncertain about the repayment of his/her debt to when he/she actually files for bankruptcy.

## V. Conclusions

Considering the lack of financial assets, the large scale of both household debt and interest burden, the high proportion of housing loans in banks portfolio and the considerable number of informal bankrupts, there is a strong possibility of personal bankruptcy issues serving as potential risk factors to a degree the Korean economy has not previously experienced.

Above all else, it seems that the assets held by Korean households are structurally vulnerable to external shocks since they have a large proportion of real assets and a small proportion of financial assets. In particular, the recent increase in housing finance loans appears to have widened the extent of risk exposure from the low income group to the middle income group. It also appears that there is an increasing probability of the asset price risks inherent in housing markets spilling over into financial markets by way of households, as the linkages running between these markets are strengthened by the large share of

housing loans.<sup>30)</sup> Furthermore, the high ratios of debt to household income, and of interest expense to household income, and the small number of filings relative to the United States and Japan suggest that macroeconomic conditions are being created in which the number of filings may soar.

A considerable number of informal bankruptcies and empirical analysis on the determinants of bankruptcy also suggest that the number of personal bankrupts will continue to increase and could even soar depending upon economic conditions in Korea. Considering the sustained increase in the number of personal bankruptcy filings and its ripple effects on society and the economy, it thus appears that the Korean government should find ways to deal effectively with the bankruptcy risks inherent in the household sector. In particular, effective practical solutions to the issues of household debt and credit defaulters are expected to be put in place over the next two to three years through the debt relief program; and it is thus important to minimize the side effects that may arise when tackling these problems.

Based on the analytical results obtained in this paper, possible measures can be summarized as follows. First, considering the possibility that a large number of informal bankrupts may serve as an uneasy factor in the society as well as in the economy, it is needed to reduce the size of informal bankruptcy. To reduce it, support for asset formation by low income groups is needed along with the more liberal application by the courts of procedures and adjudications of bankruptcy for those that have actually lost the capacity for repayment.

Second, the empirical results obtained in this paper point to the desirability of avoiding informal bankruptcies among consumers of financial services by the stepping up financial education for consumers. The empirical results show that, *ceteris paribus*, the lower the level of personal education, the higher the likelihood of filing for personal bankruptcy, and this suggests the public provision of various economic education is called for.

Third, considering the possibility that debtors may act strategically, it appears to be necessary for the Korean government to make up the shortcomings in its debt relief program in the medium and long run. Considering the social cost and inefficiency of bankruptcy, and the endogenous nature of decision-making on bankruptcy evident from the empirical analysis, it is considered essential to integrate the relief system for personal debtors placing priority on schemes for rehabilitation through individual workouts over the medium and long run.

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30) About 50% of bank loans in Korea are comprised of household loans, and the ratio of floating loans to banks' new household loans has increased from 48% in 2001 to 73% in recent years. This suggests that the probability that the credit risk inherited in the household sector may spread into financial markets has been increased.

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