FACTORS INFLUENCING OVERINDEBTEDNESS: A LOGISTIC REGRESSION ANALYSIS OF CONSUMERS IN BANGKOK

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Abstract

Overindebtedness is a source of default risk facing by commercial banks and loan institutions. Although studies of factors influencing individuals' indebtedness are prevalent, less of previous studies had examined financial factors distinguishing mild-debtors from overindebted individuals. The present study aims at identifying and empirically testing the financial factors (i.e. financial literacy, experiences in using financial services, and money management) which distinguish mild-debtors from overindebted individuals. Questionnaires were distributed to 440 respondents who are at working age in Bangkok area. Logistic regression analysis was employed in order to identify critical factors distinguishing mild-debtors from overindebted individuals. Findings from the present study indicated that financial literacy and experience in using financial services were not significant factors that distinguished mild-debtors from overindebted individuals. Money management, i.e. credit management and saving management were found to be the most significant factors distinguishing mild-debtors from overindebted individuals. Results from the present study provide implications for financial institutions to reduce adverse selection problems. Since credit management is the most critical factors influencing overindebtedness beyond other factors, records of previous credit usages and payment behaviors of individuals must be seriously take into account when determining credit approval. To reduce insolvency risk, credit rating must be used as the first priority when financial institutions approving loans. In addition, results from the present study also provide implications for policy makers to reduce personal debt problem. Since financial literacy in term of numeric calculation is not a significant factors affecting overindebtedness, financial education that emphasizes mathematic and numeric calculation may not sufficient to reduce overindebtedness problem, training on how to manage individuals' budget, saving, and using credit carefully must be emphasized to reduce financial problems.

Keywords: Money management, Credit management, Overindebtedness

1. INTRODUCTION

Debt has advantages in smoothing consumption over individuals' life-cycle (Modigliani, 1966, 1986; Butler, 2001; DeJuan & Seater, 2007). However, the more individual borrow, the more difficult it is to balance between their income and expenditure, which may result in overindebtedness. Overindebtedness increases the default incidences posing higher risk of insolvency for banks and lending institutions (Livingstone & Lunt, 1992), leading to financial sector instability, and economic vulnerability (Charpe & Flaschel, 2013).

The adverse impacts of debt have raised concerns on factors influencing overindebtedness. Previous literature had emphasized macro-economic factors (Debelle, 2004; Dynan & Kohn, 2007; Fogel & Schneider, 2011), sociological factors (Donnelly, Iyer, & Howell, 2012; Lunt& Livingstone, 1991), and psychological factors (Gathergood, 2012; Wang, Lu, & Malhotra, 2011) influencing debt. However, the study on financial factors influencing debt is still limited. In addition, previous studies on factors influencing debt have not distinguished zero to manageable debt individuals, which is, here, called 'mild-debtors' from overindebted individuals. The present research bridges the gap of previous literature by identifying and empirically testing financial factors that distinguish mild-debtors from overindebted individuals.

The present study contributes to existing literature by incorporating financial factors (i.e. money management, financial knowledge, and experience with financial services) to empirically test the influences of these factors on individual's overindebtedness. Specifically, by utilizing logistic regression analysis, the present study attempts to identify financial factors distinguishing mild-debtors from overindebted individuals. Moreover, the present study decomposes money management into four components, i.e. cash management, credit management, saving/investment management, and insurance management, in order to identify the effects of each dimension of money management in discriminating between mild-debtors from over-indebted individuals.

Results from hypothesis testing revealed that financial literacy and experience in using financial services were not the factors that distinguishing mild-debtors from overindebted individuals. Credit management and saving management were found to be the most significant factors distinguishing mild-debtors from overindebted individuals.

2. LITERATURE REVIEW AND HYPOTHESES

Since the 1990s, literatures have been emphasized on macro-economic factors affecting debt such as interest rates (Debelle, 2004), precautionary saving (Dynan & Kohn, 2007), house prices (Dynan & Kohn, 2007), employment (Fogel & Schneider, 2011), liquid asset (Kim & DeVaney, 2001; Hurst & Stafford, 2004), inflation, taxes, and liquidity constraint (Debelle, 2004). However, several previous studies have affirmed that economic factors are not related with or have only marginal effect on level of debt (Sullivan & Fisher, 1988; Canner & Luckett, 1990; Zhang & DeVaney, 1999). Psychological and sociological factors such as attitude toward debt (Livingstone & Lunt, 1992; Lea et al., 1993), self-control (Gathergood, 2012), materialism (Donnelly, Iyer, & Howell, 2012), personality (Wang et al., 2011; Donnelly et al., 2012), social support (Lea, Webley, & Walker, 1995), social comparison (Lunt& Livingstone, 1991), and compulsive buying (Alex & Raveendran, 2008) have also been identified and empirically tested as significant factors influencing debt.

Recently, there is an increasing attention on the financial factors influencing debt. A lack of financial literacy has been identified from previous studies as a major factor influencing overindebtedness (Gathergood, 2012; Lusardi & Tufano, 2015; Robb & Sharpe, 2009). Additionally, financial experiences have been reported to be a significant predictor of overindebedtness. Individuals with low level of financial literacy and financial experiences tend to be overindebted (Lusardi & Tufano, 2015). Moreover, money management is presumed to be a predictor of overindebtedness (Ksendzova, Donnelly, & Howell, 2017). Based on Donnelly, Iyer, and Howell (2012)'s study, they indicated that money management assisted in lowering accumulation of debt beyond the effect of other relevant factors, such as financial responsibility or financial literacy factor.

Regarding previous financial literatures, the present study incorporates the three financial factors influencing overindebtedness, i.e. money management, financial literacy (in term of numeracy), and experience in using financial services into the analysis. The following sections provide insights into each factor, respectively.

2.1 Money Management and Overindebtedness

Money management refers to individuals' behavior in managing personal cash, credit, saving/investment and insurance (Hilgert, Hogarth, & Beverly, 2003; Ksendzova et al., 2017). Firstly, cash management composes of individuals' activities in estimating income and expense, keeping personal record of weekly or monthly expenses, following a weekly or monthly budget, and reviewing personal spending on a regular basis (Ksendzova et al., 2017). Secondly, credit management refers to individuals' behavior on spending and debt payment, such as spend more than earn, max out the limit on credit cards, pay the total balance or made only a minimum payment (or partial payment) on loan and credit card (Ksendzova et al., 2017). Thirdly, saving/investment management includes individuals' activities in setting money aside for saving, for emergencies, for unexpected events, and for long term goals such as a home, car, or education (Ksendzova et al., 2017). Fourthly, insurance management consists of individuals' behavior in maintaining, purchasing, or reviewing the adequacy of property insurance, health insurance, life insurance, and retirement saving plan (Ksendzova et al., 2017).

A number of studies (Lea et al., 1995; Kim, Garman, & Sorhaindo, 2003; Elliot, 2005; Norvilitis et al., 2006) have posited that money management is a critical factor predicting individuals' indebtedness. Individuals who can better manage their cash, credit, saving/investment, and insurance have lower debt level. Failures in personal finance or personal money management led to higher debt. Donnelly et al. (2012) indicated that money management critically assisted in lowering accumulation of debt. Previous literature also found that mild-debtors and serious debtors are differed in their money management behavior. An empirical study of Lea et al. (1995) has classified individuals into three categories, i.e. non-debtors, mild debtors and serious debtors. Their results showed that there are significant differences among these three groups of individuals in money management skills. Non-debtors are exposed to higher money management abilities and money management facilities (e.g. bank accounts) than both mild and serious debtors. Individuals who can manage money well have lower debt in various economic conditions. Therefore, it is hypothesized that:

H1a: There is a significant difference between mild-debtors and overindebted individuals in cash management.

H1b: There is a significant difference between mild-debtors and overindebted individuals in credit management.

H1c: There is a significant difference between mild-debtors and overindebted individuals in saving/investment management, and,

H1d: There is a significant difference between mild-debtors and overindebted individuals in insurance management.

2.2 Financial Literacy (Numeracy) and Overindebtedness

Financial literacy is defined as individual skills in calculation and making simple financial decisions about interest compounding, inflation, and diversification of risk (Lusardi & Mitchell, 2014, French & McKillop, 2016). Previous studies indicated that a lack financial literacy is a significant predictor of individuals' overindebtedness. Stango and Zinman (2011) confirmed that individuals with poor understanding of financial mathematic concepts underestimated the influence of compound interest, thus, accumulated less wealth. In addition, previous studies have indicated that there is a significant difference in debt burden of individuals with different level of financial literacy. Duca and Kumar (2014) and Disney and Gathergood (2013) asserted that individuals with less financial literacy are more likely to experience higher debt burdens or loan delinquency. In contrast, individuals with high financial literacy have lower debt (Robb & Sharpe, 2009; Lusardi & Tufano, 2009). Therefore, it is hypothesized that:

H2: There is a significant difference between mild-debtors and overindebted individuals in financial literacy.

2.3 Experience in Using Financial Services and Overindebtedness

Individuals engage in various types of borrowing and lending with financial institutions. Experiences in using financial services refers to individuals' activities and experiences involving with financial transactions including traditional borrowing, saving, retirement planning, and investment (Lusardi & Tufano, 2015; Hilgert et al., 2003). Experience in using financial services is a significant factor affecting individuals' indebtedness. Lyons, Rachlis, and Scherpf (2007) indicated that personal financial experience affected personal management of credit and debt. Individuals learn from their own financial experiences and use their experiences to improve their financial decision-making (Bradley et al., 2001; Weiner et al., 2005; Johnson & Sherraden, 2007; Mandell, 2008). The more financial experiences individuals have, the lower the debt is expected (Lyons et al., 2007). Therefore, it is hypothesized that:

H3: There is a significant difference between mild-debtors and overindebted individuals in cash management in experience in using financial services.

3. RESEARCH METHODOLOGY

Since the factors that presumed to have an impact on overindebtedness are behavioral variables, a questionnaire survey method is considered as an appropriate method to test the hypotheses. Questionnaire was designed to measure all of the variables throughout the study. Questions in the questionnaire were adopted from previous literatures. The present study was conducted in the Thai context and all respondents were Thais. All questions in the questionnaire were translated into Thai by English professional. To ensure concept equivalence and accuracy of the questionnaire, back-translation into English was done by another translator who possesses fluent skills in both Thai and English languages. With this procedure, the inconsistency between English and Thai questionnaire were minimized. Furthermore, to ensure accuracy and validity of questionnaire, both English and Thai questionnaires were given to the three financial experts. Financial experts were asked to comment on the inconsistency problem that might arise from the English-version and Thai-version questionnaire. All recommendations from the three financial experts were used for improving the questionnaire. Finally, the questionnaires were distributed to thirty respondents to test for the reliability of the questionnaire. The Cronbach's Alpha was higher than minimum requirement of 0.7 (Hair, Black, Babin, & Anderson, 2010) indicating that the items representing variables were internally consistent.

3.1 Sample Size and Data Collection

The target population was individuals at working age who work in Bangkok. According to Yamane (1967), it is recommended that a suitable sample size with a population of more than 100,000 with 5% confidence limits is 400. Bangkok Labor force was approximately 5.3 million (NSO, 2016). Questionnaires were distributed to 440 respondents who were at working age in Bangkok during March 2018. Data were collected mostly in business areas in Bangkok using a self-administered questionnaire by field workers. Respondents were randomly selected. They were people of working age with regular income and were available to answer questionnaires. The data collection using field workers was recommended by Malhotra (2010). The researcher recruited experienced field workers. These field workers were supervised and trained to make sure that collected data possess high quality.

3.2 Measurement of Variables

3.2.1 Money Management

Money management was measured by 18-item Brief Money Management Scales (BMMS) developed by Ksendzova et al. (2017). Money management was decomposed into four major variables: cash management, credit management, saving/investment management, and insurance management. Respondents were asked to rate how often they had engaged in each of these activities (1=never to 5 = always).

Firstly, cash management was measured by four questions including respondents' activities in estimating income and expense, keeping record of weekly or monthly expenses, following a weekly or monthly budget, and reviewing spending on a regular basis. Secondly, credit management was assessed through five questions including respondents' behavior on spending and debt payment, such as spend more than earn, max out the limit on credit cards, pay the total balance or made only a minimum payment (or partial payment) on loan and credit card. Thirdly, saving/investment management was measured by four items including respondents' activities in setting money aside for saving, for emergencies, for unexpected events, and for long term goals such as a home, car, or education. Fourthly, insurance management was measured by five items designed to assess respondents' behavior in maintaining or purchasing the adequacy of property insurance, health insurance, life insurance, and retirement saving plan, and reviewing the adequacy of the insurance coverage (Ksendzova et. al., 2017).

3.2.2 Financial Literacy (Numeracy)

Financial Literacy (numeracy term) was measured by three questions adopted from the seminal work of Lusardi and Tufano (2015). The first question designed to assess respondents' knowledge in interest compounding. The second question is designed to assess respondents' financial literacy regarding debt repayment and the third question assesses respondents' skill on comparing payment options and their financial literacy regarding time values of money. The correct answer of each question received a score of "1". Then, the score of these three questions were added up to form financial literacy variable.

3.2.3 Experiences with Financial Services

The present study measured respondents' experiences with financial services by utilizing nine questions adopted from the seminal work of Lusardi and Tufano (2015)'s. Lusardi and Tufano (2015) had categorized financial experiences into four major groups: (1) Experience with traditional borrowing, excluding credit card, (2) Experience with alternative financial service borrowing, (3) Experience with saving/investment payments, and (4) Typical transaction mode for credit card. The second group of questions (experience with alterative financial borrowing) was dropped because it was considered improper in the Thai context. Some of financial services were either not available or not known among Thais. In addition, the fourth group of questions was also dropped because it was not coherent with the present study's objectives.

Respondents were asked to specify whether they have ever engaged in nine activities namely taken out a loan for student education, taken out auto loan, taken out a home equity loan, gotten a mortgage, open checking account, open saving account, buying bonds, invested in mutual fund, and invested in stocks. The answer "no" receives a score of "0", while the answer "yes" receives a score of "1". The score of the nine questions were added up to form experiences in using financial services variable.

3.2.4 Overindebtedness

Overindebtedness was measured by the questions adapted from Gathergood (2012)'s. Respondents were asked to select the statement that best describes how well they are keeping up with their credit commitment ranging from "I don't have any bills or credit commitment", "I am keeping up with all bills and commitments without any difficulties", "I am keeping up with all bills and commitments but it struggle from time to time", "I am keeping up with all bills and commitments but it is a constant struggle", "I am falling behind with some bills or credit commitments", and " I am having a real financial problem and have fallen behind many bills or credit commitment". Respondents who had no bill or credit commitment and can keep up with all bills and commitments without difficulty were code as "0" while others were code as "1".

3.3 Control Variables

The present study included six control variables into the model, i.e. gender, age, education degree, marital status, disposable income, and number of credit card into the model since previous literatures revealed that these variables have influences on overindebtedness.

3.4 Statistical Treatment of Data

Data were analyzed by logistic regression analysis. Logistic regression analysis allows the researchers to distinguish mild-debtors from overindebted individuals. Debt was the dependent variable. It was categorized into two groups. The first group (coded with 0) characterized by non-debtors and mild-debtors, while the second group (coded with 1) for overindebted individuals. The independent variables were financial literacy, experience in using financial services, cash management, credit management, saving/investment management and insurance management. Six control variables as mentioned earlier were included in the model.

4. RESULTS

4.1 Descriptive statistics

Majority of respondents were female (67% of total respondents). Mean of respondents' age was at 30.58 while its median was 28 years. Most of the respondents graduated bachelor degree (70.4% of total respondents). There were more of respondents who were single (74.6%) than married (25.4%). Respondents reported that the maximum number of credit card they held was ten cards while some of them reported that they have no credit card. Mean and median of number of credit card held was one and zero card, respectively.

Majority of respondents were mild-debtors (74.1% of total respondents). Overindebted respondents were accounted for 25.6% of total respondents. From the total respondents, they ranked their money management skills as followed: credit management with mean score 3.87, saving management with mean score 3.5, cash management with mean score 3.25, and insurance management with mean score 3.03.

Based on financial literacy, half of the total respondents (51.1% of total respondents) answered only one question correctly. Only 0.7% of the total respondents answered all of the three questions correctly. Median of financial literacy was equal to one. Regarding experience in using financial services, majority of respondents reported having experiences in at least two financial services (24.2% of total respondents). Median of financial experience was equal to three.

4.2 Logistic regression analysis

Logistic regression was employed to test the hypotheses of the study. The binomial logistic regression determined the probability of overindebted occurrence. Hosmer and Lemeshow test was utilized for testing the goodness of fit of the model (Table 1). The high p-value (greater than 0.05) indicated that model was correctly specified (Hosmer & Lemeshow, 1980). Finding confirmed that the model has a good fit or correctly specified with significance value of 0.78. The reasonable fit of the model to the data was verified by the classification table (Table 2) that revealed that 321 out of 409 or 78.5% of the samples were correctly classified into their groups.

Table 1
Hosmer and Lemeshow Test

Step	Chi-square	df.	Sig.
1	4.788	8	.780

Table 2
Classification of the observed and predicted overindebtedness

<table>
<tr><th colspan="2" rowspan="3">Observed</th><th colspan="3">Predicted</th></tr>
<tr><th colspan="2">Overindebted</th><th rowspan="2">Percentage correct</th></tr>
<tr><th>0</th><th>1</th></tr>
<tr><td rowspan="2">Overindebted</td><td>0</td><td>285</td><td>18</td><td>94.1</td></tr>
<tr><td>1</td><td>70</td><td>36</td><td>34.0</td></tr>
<tr><td colspan="2">Overall percentage</td><td></td><td></td><td>78.5</td></tr>
</table>

Table 3 shows results from the logistic regression analysis. The predictive power of the model was reported by Cox & Snell R square and Nagelkerke R Square with value of 0.193 and 0.283, respectively (Table 3).

Table 3
Logistic regression results

	B	S.E.	Wald	Exp(B)	Sig.
Constant	2.380	1.020	5.447	10.806	.020
Gender	.230	.275	.702	1.259	.402
Age	.034	.021	2.783	1.035	.095
Edu_degree	.013	.227	.003	1.013	.955
Marital_status	-.054	.335	.026	.948	.872
Disp_Inc	-.009	.005	3.458	.991	.063
Credit_no	.191	.091	4.413	1.210	.036
Cash_M	-.208	.162	1.649	.812	.199
Credit_M	-.832	.153	29.615	.435	.000
Saving_M	-.317	.190	2.782	.729	.095
Insur_M	.032	.169	.035	1.032	.852
Fin_Lit	-.185	.192	.923	.831	.337
Fin_Expe	.112	.081	1.917	1.119	.166
Cox & Snell R^2	.193				
Nagelkerke R^2	.283				

Remark: Edu_degree is education degree, Disp_Inc is disposable income (in thousand), Credit_no is credit hard held by respondent, Cash_M is cash management, Credit_M is credit management, Saving_M is saving management, Insur_M is insurance management, Fin_Lit is financial literacy, and Fin_Expe is financial experience.

4.3 Money Management and Overindebtedness

4.3.1 Cash management and Overindebtedness

Results from logistic regression showed that the difference between mild-debtors and overindebted individual was statistically insignificant at 0.05 significance level. Thus, Hypothesis 1a was not supported.

4.3.2 Credit management and Overindebtedness

Results indicated that the difference between mild-debtors and overindebted individuals in credit management was statistically significant at 0.05 significance level. Thus, Hypothesis 1b was supported.

4.3.3 Saving/investment management and Overindebtedness

Result from logistic regression indicated that the difference between mild-debtors and overindebted individuals in saving/investment management was significant at 0.1 significance level. Therefore, Hypothesis 1c was supported.

4.3.4 Insurance management and Overindebtedness

Results showed that the difference between mild-debtors and overindebted individuals was insignificant at 0.05 significance level. Therefore, Hypothesis 1d was not supported.

4.3.5 Financial literacy and Overindebtedness

Results indicated that there was no significant difference between mild-debtors and overindebted individuals in financial literacy at 0.05 significance level. Therefore, Hypothesis 2 was not supported.

4.3.6 Experiences in using financial services and Overindebtedness

Results from logistic regression showed that there was no significant difference between mild-debtors and overindebted individuals in experience in using financial services at 0.05 significance level. Therefore, Hypothesis 3 was not supported.

5. CONCLUSIONS AND RECOMMENDATIONS

The purpose of the present study was to identify factors influencing overindebtedness. Results from hypotheses testing indicated that financial literacy and experience in using financial services were not the factors that distinguishing mild-debtors from overindebted individuals. Only personal money management was found to be a significant factor distinguishing mild-debtors from overindebted individuals. Consistent with Donnelly et al. (2012) who indicated that money management possessed higher influences on debt beyond financial literacy and experiences. Results also confirmed the study of Lea et al. (1995) which indicated that mild-debts and overindebted individuals were differences in money management skills. Individuals who managed their money well had lower debt in various economic conditions.

However, when decomposed money management skills into four categories, results showed that only credit management and saving/investment management were the factors that distinguishing mild-debtors from overindebted individuals. Mild-debtors were more careful when using credit than overindebted individuals. They tended to save and set aside money for emergencies and unexpected expense. While overindebted individuals spent more than earn, tended to get themselves into more debts, and did not pay the total balance of credit card. Results from hypotheses testing also showed that insurance management and cash management skills were not differences between mild-debtors and overindebted individuals. Individuals' decisions to purchase insurances and retirement saving plan did not influence the level of indebtedness.

Moreover, number of credit card held by individuals was also found to be a significant factor distinguishing mild-debtors from overindebted individuals. In other words, a person who holds a greater number of credit cards is more likely to become overindebted.

6. IMPLICATIONS FOR PRACTITIONERS

Results from hypotheses testing provide implications for assisting the creditors to reduce adverse selection problems. In reality, the provision of credit to overindebted individuals is associated with high default risks. Since credit management is the major factors influencing overindebtedness, records of previous credit using and payment behaviors of individuals must be included as crucial factors in determining credit approval. Banks and loan association should give priority to credit record or credit rating and previous payment behavior when approve loans.

In addition, results from the present study also provides implications for government and policy makers to reduce personal debt. Financial literacy, in term of numeracy, is not a predictor of overindebtedness. Financial education that emphasizes numeric calculation could not reduce debt problem. Financial education must emphasize on how to manage individuals' money and credit or focus more on personal finance issues.

Finally, the present study revealed that number of credit card held by individuals is a significant factor predicting overindebtedness. Consequently, policy maker should be careful when individuals apply for credit cards. Policy to limit the number of credit card held may be an effective tool to reduce overindebted problem.

7. SUGGESTIONS FOR FUTURE RESEARCH

The present study identified and empirically tested the influences of three financial factors (i.e. financial literacy, experiences in using financial services, and money management behavior) distinguishing mild-debtors from overindebted individuals. However, the power of these three factors in explaining overindebtedness is still limited. Future research may extend existing study to include other factors influencing indebtedness, particularly psychological factors such as self-control, self-esteem, materialism, and compulsive buying behavior, into the analysis to increase the explanation power of the model.

In addition, the present study measured overindebtedness by total debt outstanding burden. Future research may categorize debt into various types, e.g. mortgage and credit card debt, since different types of debt are varied in their nature and effects.

Finally, the present study conducted in Bangkok area. All of respondents are Thai. There is a need for future research to replicate and extend the existing study to other contexts. Replication and extension of existing study to investigate respondents in various countries with different cultures are required for the results to be generalized across countries.

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