Borneo Akademika

e-ISSN: 2735-2250

Available online at
https://borneoakademika.uitm.edu.my

Volume 8(2) December 2024, 24-35

Borneo
Akademika

The Effect of Financial Technology (FinTech) Adoption on Individual Over-Indebtedness in Asean-5 Countries

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ARTICLE INFO

Article history:
Received 1 October 2024
Accepted 15 November 2024
Online first
Published 20 December 2024

Keywords:
over-indebtedness
financial technology
FinTech
Asean-5 countries

ABSTRACT

This article examines the impact of financial technology (FinTech) on individual over-indebtedness in ASEAN-5 countries (Malaysia, Indonesia, Thailand, Singapore, and the Philippines). While FinTech has revolutionised financial services, enhancing accessibility and efficiency, it raises concerns about over-indebtedness, where individuals struggle to meet debt obligations. The study investigates how FinTech, alongside macroeconomic factors such as household consumption, economic growth, unemployment, and inflation, influences over-indebtedness. Utilising a static quantitative panel data approach from 2010 to 2020, the research finds that FinTech Adoptions negatively correlate with over-indebtedness, suggesting that FinTech can enhance financial stability through improved financial literacy alongside the financial credit assessment capabilities. Conversely, higher household consumption is positively associated with over-indebtedness, indicating that increased borrowing to finance consumption leads to higher debt levels. Economic growth shows a negative relationship with over-indebtedness, as improved economic conditions enhance individuals' ability to repay debts. Unemployment rates also negatively correlate with over-indebtedness, highlighting the complex interplay between employment and borrowing behaviours. Inflation, however, is statistically insignificant in affecting over-indebtedness. Nonetheless, the study's limitations include potentially overlooking the dynamic cultural differences within the ASEAN-5 countries, and the complex interplay between the economic conditions and impulsive borrowing behaviors of these countries. Finally, this research contributes to understanding the multifaceted nature of over-indebtedness and the role of FinTech in shaping financial behaviours in ASEAN-5 countries that could provide relevant insights to individuals, academics and policymakers for further development.

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INTRODUCTION

Financial technology, commonly known as FinTech, has revolutionised the financial services industry by leveraging technology to enhance financial activities. FinTech encompasses a wide range of applications, including mobile banking, peer-to-peer lending, robo-advisors, and blockchain technology. These innovations have made financial services more accessible, efficient, and user-friendly, significantly impacting how individuals manage their finances. However, alongside these benefits, there are concerns about the potential negative effects of FinTech on individual financial behaviour, particularly regarding over-indebtedness. Over-indebtedness refers to a situation where an individual is unable to meet their debt obligations, leading to financial distress and potential insolvency. This issue is critical as it affects not only the financial well-being of individuals but also the broader economic stability.

BACKGROUND OF THE STUDY

Over-indebtedness can be defined as the amounts of money that have been borrowed but on which the debtor has not made any of the payments that were planned for at least ninety days. Over-indebtedness is one of the major problems in contemporary society (Carlsson et al., 2017; Ferreira et al., 2021; Hiilamo, 2020; Idris et al., 2018). It has been demonstrated that excessive debt can have detrimental effects on the individual, society, institutions, and economic conditions of a nation (Cuesta & Budris, 2015; Goedde-Menka, 2017; Pazarbasioglu, 2019). In short, it is a loan that is either in default or close to default. Over-indebtedness occurs when consumer credit is easily accessible, which encourages borrowers to take on more debt than they need.

Over-indebtedness is a common issue worldwide. According to Dick and Lehnert (2010), the increase in over-indebtedness associated with credit liberalisation is partly due to high consumer borrowing, especially in ASEAN-5 countries, including Malaysia, Indonesia, the Philippines, Singapore, and Thailand. Thus, a lower level of over-indebtedness is also directly associated with the overall economic health. According to Saigal (2019), through financial technology, often known as FinTech, technological advancements have been developed to meet the needs of this dissatisfied market. According to Schueffel (2016), the term "FinTech" refers to any procedure that makes use of technology to make financial processes more efficient.

The increasing usage of the internet has led to the rise of FinTech due to its convenience and ease of access. From 2010 to 2020, the usage of FinTech in Malaysia has been on the rise, indicating that many individuals are attracted to FinTech application platforms because of their simplicity and accessibility. Ease of access causes high and frequent loan application frequency for individuals, resulting in unsustainable debt. Since the 2008 Global Financial Crisis, financial intermediaries have incorporated FinTech technology in a continuous wave of financial innovation. It is also practical to investigate the potential influence of this FinTech innovation on the rate of over-indebtedness (Acar & Tak, 2019). Understanding the relationship between FinTech and over-indebtedness is crucial for several reasons. First, FinTech lenders have less stringent collateral requirements than banks, which can expose them to credit risk from borrowers (Magee, 2011). When borrowers default, FinTech lenders' loans may not be fully recovered from collateral value. Second, FinTech lenders frequently lack the legal support necessary to directly pursue loan recovery efforts against debtors, resulting in minimal or no debt recovery action against defaulting borrowers, leading to an increase in over-indebtedness (Usanti et al., 2020). Thirdly, banks may be reticent to cooperate with FinTech lenders if FinTech agents experience high rates of loan default (Romnova & Kudinska, 2016; Temelkov, 2018)

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According to Thomas and Michael (2002), policymakers' top concern is the rising over-indebtedness rate. The factors that lead to over-indebtedness have been extensively studied, where the factors mainly contributed to household consumption, unemployment rate, economic growth, interest rate, and financial technology. An alarmingly high number of FinTech loan defaults, particularly among individuals in ASEAN-5 countries, is a phenomenon that requires careful examination. FinTech businesses and financial advisers should strategise and prioritise having credit access modules that provide protection against default. In what appears to be the present dramatic twist, FinTech facilities may be a contributing reason to their own default. Both Hwang and Tellez (2016) and Kaffenberger and Chege (2016) noted in their respective works that digital credit loans are typically of smaller amounts, shorter terms, significantly more expensive, and have higher annualised interest rates than traditional consumer loan products offered by conventional microfinance institutions.

The younger generation in today's society has a tendency to overborrow, going beyond their capacity to manage the degree of debt, as seen by the growing number of over-indebtedness recorded from year to year. However, the FinTech industry as a whole ignores this. The company's top priorities are making money and breaking into new markets. Unlike more traditional financial institutions like banks, the FinTech industry does not conduct thorough credit appraisals of loan applicants. Instead, they freely hand out credit and then harass their consumers until they pay up. Unfortunately, no research on FinTech credit facilities has looked beyond the benefits in terms of convenience and efficiency.

FinTech lenders are able to provide a wider range of loans at more competitive interest rates, making them more accessible to individuals, households, and businesses. When borrowers fail to make their payments, over-indebtedness can result from lending done by FinTech lenders because of their smaller loan portfolios and the fact that they place a greater emphasis on retail loans rather than commercial loans (Bruckner, 2018; Claessens et al., 2018). The relationship between over-indebtedness and macroeconomic factors can be seen when individuals' over-indebtedness has increased dramatically as a result of a "culture of spending" fostered by tremendous growth in consumer goods and the "democratisation of credit" that led to better access to credit in many nations throughout the world (Kus, 2015).

Consumers have evolved to view credit as a tool that gives them the ability to improve their lives by capitalising on their future earning potential, and this perception has contributed to the widespread acceptance of consumer credit (Kilborn, 2005). The growth of household consumption, which is critical to the expansion of the economy (McCarthy & McQuinn, 2015), is fueled, in large part, by the expansion of credit. Thus, there are some external factors that were identified as contributors to the economic reasons, including an increase in the unemployment rate, high levels of inflation that diminished purchasing power based on present income levels, a drop in demand for their products, or a shift in the regulatory landscape that altered the business outlook.

As a result, researchers concluded that the growing usage of financial technology loans was associated with macroeconomic factors. Consequently, it is of utmost importance to focus on over-indebtedness and conduct an in-depth analysis of how FinTech influences household over-indebtedness while controlling for macroeconomic factors such as inflation rate, household consumption, unemployment rate, and economic growth. Hence, this study aims to determine the potential impact of adopting FinTech on individual over-indebtedness in ASEAN-5 countries.

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LITERATURE REVIEW AND THEORIES

The literature review critically examines the existing body of research on the relationship between FinTech and individual over-indebtedness. This chapter explores various dimensions of over-indebtedness, including its causes, consequences, and the role of FinTech. The review is structured to provide a comprehensive understanding of the topic, drawing on empirical studies, theoretical frameworks, and relevant models.

Theoretical Development and Research Gaps

In order to clarify the complex relationships between financial technology, consumer behaviour, and economic issues, the study's theoretical framework integrates a number of relevant theories. According to behavioural finance theory, people frequently make irrational financial decisions. As a result of FinTech's growth in loan availability and accessibility, consumers now view borrowing as a way to get over their financial difficulties. This perception, shaped by marketing that emphasises immediate benefits over long-term consequences, can result in over-borrowing (De Bortoli et al., 2019; Otor et al., 2022). According to the study, the increase in household spending brought on by credit expansion is consistent with behavioural finance theories and could lead to higher debt levels (Valcanover et al., 2020).

Furthermore, FinTech's use of sophisticated algorithms and data analytics has led to the evolution of credit risk assessment models, which use non-traditional data sources to provide more precise evaluations of borrowers' creditworthiness (Jagtiani & Lemieux, 2019; Liu et al., 2022). The study reveals a negative correlation between FinTech adoption and over-indebtedness, indicating that improved credit assessment capabilities enhance financial stability and lower default risks, thus supporting the idea that better risk assessment can mitigate the negative impacts of consumer credit (Philippon, 2016; Chiu & Huang, 2022).

The relationship between economic conditions and consumer behaviour is further clarified by the Economic Theory of Consumption, which shows a positive correlation between household consumption and excessive debt, with higher borrowing to finance consumption leading to higher debt levels (Carroll et al., 2017; Agnew et al., 2022). Conversely, economic growth is associated with lower levels of over-indebtedness, suggesting that favourable economic conditions support individuals' capacity to repay debts, highlighting the importance of sustainable borrowing practices amidst economic fluctuations (Dynan, 2012; Lee et al., 2023). Financial Literacy and Education are also pivotal in debt management, emphasising the need for financial education to help households navigate the complexities of borrowing and prevent over-indebtedness (Lusardi & Mitchell, 2014; Aprea et al., 2022). The risks associated with FinTech lending can be minimised through equipping consumers with the information they need to make wise financial decisions.

Furthermore, despite extensive studies on FinTech and financial behaviour, gaps remain in understanding the long-term effects of FinTech on individual over-indebtedness. Specifically, there is a need for more empirical studies that examine the causal relationship between FinTech usage and debt levels. Additionally, the role of financial literacy in mediating this relationship is an area that requires further exploration. The literature review highlights the multifaceted nature of over-indebtedness and the complex role of FinTech in influencing financial behaviour. While FinTech offers numerous benefits, such as improved access to credit and financial services, it also poses risks related to impulsive borrowing and financial mismanagement. Understanding the interplay between FinTech, economic factors, and individual behaviour is crucial for developing effective strategies to mitigate over-indebtedness. Future research should focus on empirical

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studies that explore the long-term impact of FinTech on financial health and the role of financial literacy in promoting responsible financial behaviour.

Over-Indebtedness

Over-indebtedness is a significant issue affecting individuals and households globally. It is characterised by the inability to meet debt obligations, leading to financial distress and potential insolvency. According to Mutsonziwa and Fanta (2019), over-indebtedness can be attributed to behavioural factors, risk events, and supply-side variables. Behavioural research indicates that impulsivity and overconfidence bias are major contributors to over-indebtedness. Impulsive individuals are more likely to engage in short-sighted financial behaviours, making it difficult to comprehend the long-term consequences of their spending decisions fully. Overconfidence bias leads individuals to underestimate their vulnerability to debt problems.

Risk events, such as job loss, poor money management, unexpected expenses, and economic downturns, can also trigger over-indebtedness. These events alter the initial conditions under which credit agreements were made, making it challenging for individuals to repay their debts. For instance, high medical costs, increased debt servicing costs, and changes in family structure (e.g., divorce or loss of a family member) can exacerbate financial difficulties (Mutsonziwa & Fanta, 2019). In Malaysia, over-indebtedness is often linked to poor financial decision-making. Hassan et al. (2021) found that the inability to prioritise purchases and excessive credit card spending are major contributors to over-indebtedness. High unemployment rates and household consumption further influence consumer attitudes and spending patterns, leading to financial strain.

Financial Technology (FinTech)

FinTech has transformed the financial landscape, offering innovative solutions for financial services. However, its impact on over-indebtedness is complex. Wambua (2022) found that FinTech is closely related to non-performing loans due to the ease of loan access. FinTech applications facilitate rapid decision-making and shorter feedback loops for loan applicants, increasing loan accessibility. However, this ease of access can lead to impulsive borrowing and financial mismanagement.

Ozili (2021) noted that FinTech lenders have significantly increased lending activities, providing a wider range of loans at competitive rates. This increased lending can lead to over-indebtedness if borrowers fail to manage their finances effectively. Nur Hafidzah et al. (2019) also highlighted the role of FinTech in influencing consumer purchasing habits, leading to impulsive buying and debt accumulation.

Household Consumption

Household consumption plays a crucial role in the economy but can also contribute to over-indebtedness. According to the Department of Statistics Malaysia, the average monthly household consumption expenditure increased from RM4,033 in 2016 to RM4,534 in 2019, growing at an annual rate of 3.9%. Toh Siaw and Rusmawati (2018) suggest that high consumption, particularly in transportation, is a significant factor in over-indebtedness. Households that allocate a large portion of their income to necessities may have less disposable income for other expenses, leading to financial strain.

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Zhu (2011) found that household consumption, including mortgage debt, vehicle loans, and credit card debt, positively correlates with over-indebtedness. Medical expenses also contribute to financial difficulties. Changes in income levels can increase household consumption, further exacerbating debt problems (Toh Siaw & Rusmawati, 2018). Azwani Mohamad Azmin et al. (2019) found that higher household spending is associated with increased over-indebtedness in South Africa.

Inflation Rate

Inflation is another critical factor influencing over-indebtedness. Hilmy et al. (2013) identified inflation as a primary cause of over-indebtedness, particularly revolving debt like credit card debt. High inflation rates increase the cost of living, making it difficult for individuals to repay their debts. White (2007) found that high credit card balances, coupled with rising inflation, lead to repayment difficulties. Bank Negara Malaysia reported that Malaysians increasingly use credit cards and borrow more as inflation rises, leading to higher levels of over-indebtedness.

Azira Abdul et al. (2017) also highlighted the role of inflation in over-indebtedness. Their study found that young Malaysians often live beyond their means, with a significant portion of their income going towards loan repayments. The ease of accessing credit facilities and favourable credit environments contribute to financial mismanagement and over-indebtedness.

Unemployment Rate

The unemployment rate has a direct impact on over-indebtedness. Platt (2011) found a positive relationship between unemployment and over-indebtedness, as job loss leads to a loss of income and financial instability. Families with unemployed members often deplete their savings to cover basic expenses, leading to increased borrowing and financial strain. Unemployment disrupts income streams, making it difficult for individuals to repay their debts, resulting in loan defaults and over-indebtedness (Tan Ann, 2017).

Chinnasamy et al. (2021) reported that the unemployment rate in Malaysia rose to 3.3% due to the COVID-19 pandemic. Their research found a strong correlation between unemployment and over-indebtedness, supporting the theoretical approach by Deng, Quiqley, and Van Order, which posits that unemployment significantly impacts financial stability.

Economic Growth

Economic growth influences over-indebtedness by affecting borrowers' ability to repay loans. Shaliza Azreen et al. (2021) noted that since the global economic crisis of 2010, Malaysia's economic condition has not improved significantly, raising concerns about rising indebtedness. Song and Appiah-Otoo (2022) found that FinTech can support economic growth by facilitating quicker loan approvals and enhancing businesses' ability to deploy funds efficiently. However, this ease of access to credit can also lead to impulsive borrowing and increased over-indebtedness.

Muhammad Ishfaq et al. (2016) found a negative relationship between economic growth and over-indebtedness. Higher economic growth rates are typically associated with higher income levels, improving borrowers' ability to repay debts and reducing over-indebtedness. Conversely, negative economic growth leads to increased bad debts (Abhigale, 2015).

The literature review highlights the multifaceted nature of over-indebtedness and the complex role of FinTech in influencing financial behaviour. While FinTech offers numerous benefits, such

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as improved access to credit and financial services, it also poses risks related to impulsive borrowing and financial mismanagement. Understanding the interplay between FinTech, economic factors, and individual behaviour is crucial for developing effective strategies to mitigate over-indebtedness. Future research should focus on empirical studies that explore the long-term impact of FinTech on financial health and the role of financial literacy in promoting responsible financial behaviour.

MATERIALS AND METHODS

This chapter outlines the research design, data collection methods, and data analysis techniques used in this study. The primary focus is on the processes and methodologies employed to gather and analyse data related to the impact of Financial Technology (FinTech) on over-indebtedness in ASEAN-5 countries (Malaysia, Indonesia, Thailand, Singapore, and the Philippines) from 2010 to 2020. The research design is quantitative, using secondary data to examine the relationship between FinTech and over-indebtedness. The study employs a panel data analysis to capture the dynamics over time and across different countries.

Table 1. Data, Variables and Descriptions

Variables	Descriptions	Sources
Over-indebtedness	Bank non-performing loans to total gross loans ratio	BNM Statistics
FinTech Adoptions	Penetration percentage of Internet banking	World Bank Data
Household Consumption	Household consumption to GDP ratio	World Bank Data
Economic Growth	Annual GDP growth rate	World Bank Data
Unemployment rate	Unemployment rate as a percentage of the total labor force	International Labour Organization (ILO)
Inflation rate	Annual percentage change in consumer prices	World Bank Data

Table 2 highlights the results from the Panel Corrected Standard Errors (PCSE) model, which was identified as the best fit for the data. The diagnostic tests confirm the robustness of the model, addressing issues such as heteroscedasticity, serial correlation, and multicollinearity. The PCSE model results indicate that household consumption, fintech integration, economic growth, and unemployment rate are significantly related to over-indebtedness. Inflation rate, however, was found to be statistically insignificant.

Table 2. Regression Results based on the PCSE Model

Independent Variables	**Panel Corrected Standard Errors (PCSE)**	**Results**
FinTech Adoption	-0.0166***	Significant and Negative
Household Consumption	0.1028***	Significant and Positive

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Economic Growth	-0.2568***	Significant and Negative
Unemployment rate	-0.2593***	Significant and Negative
Inflation rate	-0.0177	Insignificant and Negative

DISCUSSIONS

The negative relationship between FinTech and over-indebtedness suggests that the integration of financial technology can enhance financial stability. This finding contradicts the studies by Wambua (2022) and Nur Hafidzah et al. (2019), which posited that FinTech increases lending and subsequently leads to higher debt levels. However, the alignment with Pierri & Timmer (2020), Bruckner (2018), and Claessens et al. (2018) indicate that technology adoption can improve credit assessment processes, reduce non-performing loans, and enhance financial inclusion. The use of advanced algorithms and data analytics in FinTech can lead to more accurate credit scoring and risk assessment, thereby reducing the likelihood of over-indebtedness.

The positive relationship between household consumption and over-indebtedness is consistent with the findings of Hussain (2002) and Zhu (2011). Higher household consumption often leads to increased borrowing to finance consumption expenditures, which can result in higher debt levels. This relationship underscores the importance of financial literacy and responsible borrowing practices. As households consume more, they may rely on credit to sustain their consumption patterns, leading to a cycle of debt accumulation. Policymakers need to focus on promoting financial education to help households manage their finances better and avoid over-indebtedness.

The negative relationship between economic growth and over-indebtedness aligns with the studies by Salas and Saurina (2002) and Jouini (2013). Higher economic growth typically leads to increased income levels, improved employment opportunities, and better financial health for individuals and businesses. This economic prosperity reduces the financial strain on households and businesses, thereby decreasing the likelihood of over-indebtedness. Economic growth can also enhance the capacity of borrowers to repay their debts, reducing the incidence of non-performing loans. Therefore, fostering economic growth is crucial for mitigating over-indebtedness.

The negative relationship between the unemployment rate and over-indebtedness suggests that lower unemployment rates can lead to higher debt levels. This counterintuitive finding may be explained by wage inflation and increased consumer spending during periods of low unemployment. When unemployment rates are low, individuals have more disposable income and are more likely to borrow to finance consumption and investment. However, this increased borrowing can lead to higher debt levels if not managed properly. It highlights the need for balanced economic policies that promote employment while ensuring sustainable borrowing practices.

The positive but statistically insignificant relationship between the inflation rate and over-indebtedness suggests that inflation may not be a significant factor in increasing debt levels in ASEAN-5 countries. While inflation can erode the real value of debt, it can also lead to higher interest rates, increasing the cost of borrowing. The insignificant relationship indicates that other

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factors, such as economic growth, employment, and financial literacy, may play a more critical role in influencing over-indebtedness. Policymakers should consider these factors when designing strategies to address over-indebtedness.

CONCLUSION AND RECOMMENDATIONS

This research has comprehensively analysed the impact of financial technology (FinTech) on individual over-indebtedness in ASEAN-5 countries (Malaysia, Indonesia, Thailand, Singapore, and the Philippines). The findings reveal a nuanced relationship between FinTech adoption and over-indebtedness, highlighting the potential benefits and risks of FinTech innovations.

The study demonstrates that FinTech adoption is negatively correlated with over-indebtedness, suggesting that FinTech can enhance financial stability through improved credit assessment and risk management. This finding aligns with the notion that advanced algorithms and data analytics used in FinTech can lead to more accurate credit scoring and risk assessment, thereby reducing the likelihood of over-indebtedness. However, the positive relationship between household consumption and over-indebtedness underscores the importance of financial literacy and responsible borrowing practices. Higher household consumption often leads to increased borrowing to finance consumption expenditures, which can result in higher debt levels.

Economic growth is found to have a negative relationship with over-indebtedness, indicating that improved economic conditions enhance individuals' ability to repay debts. Conversely, the negative relationship between the unemployment rate and over-indebtedness suggests that lower unemployment rates can lead to higher debt levels due to increased consumer spending and borrowing during periods of low unemployment. The study also finds that inflation is statistically insignificant in affecting over-indebtedness, indicating that other factors, such as economic growth, employment, and financial literacy, play a more critical role.

To mitigate the risks of over-indebtedness while leveraging the benefits of FinTech, it is essential to enhance financial literacy programs that educate individuals on responsible borrowing and financial management. Promoting responsible lending practices through stringent credit assessments and advanced data analytics is crucial for FinTech companies. Governments should focus on policies that encourage economic growth, as improved economic conditions enhance debt repayment capabilities. Regulatory bodies must monitor and regulate FinTech activities to ensure adherence to responsible lending practices and protect consumers from predatory lending. Additionally, developing support mechanisms for unemployed individuals, such as unemployment benefits and job training programs, can help manage finances during periods of unemployment. Finally, fostering collaboration between FinTech companies and traditional financial institutions can lead to innovative financial products and enhance overall financial stability.

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