Exploring the Effect of the Government Interventions on the Information Asymmetry in the Post-Pandemic

Chih-Hsiung Chang
I-Shou University

The article aimed to explore the effect of the government intervention on the information asymmetry in Taiwan's credit card market during the post-pandemic. To achieve the goal, the article constructed the information asymmetry model which was combined with the government interventions, adverse selections and moral hazards and designed the hypotheses. It was concluded that the government interventions involved with the fiscal and monetary policies failed to improve the market failure and even caused the government failure. The conclusions revealed a significant implication for the policymakers to make the proper policies when facing the challenges in the future.

Keywords: government intervention, information asymmetry, post-pandemic, adverse selection, moral hazard

INTRODUCTION

The pandemic broke out at the end of 2019 and quickly spread worldwide. It was not until May 2023 that the World Health Organization officially declared COVID-19 to be over as a public health emergency of international concern. However, as the restrictions in response to the pandemic were gradually lifted, the post-pandemic era began in 2022. Entering the post-pandemic period, the impact of the pandemic never stopped. One of the most frequently mentioned was the impact on medical health.

The epidemic broke out at the end of 2019 and quickly spread worldwide. It was not until May 2023 that the World Health Organization officially declared COVID-19 to be over as a public health emergency of international concern. However, as the restrictions in response to the epidemic were gradually lifted, the post-epidemic era began as early as 2022 (Seyidoglu et al., 2024). However, even in the post-epidemic period, the epidemic's impact almost continued. One of the most frequently mentioned was the impact on medical health. Boccabella et al. (2024) argued that COVID-19 triggered and expanded antimicrobial resistance (AMR) diffusion worldwide, mainly because of the uncontrolled and improper use of antimicrobials. Lorenzo et al. (2024) proposed that females more frequently required hospitalizations for depressive behaviour and males for aggressive behaviour and schizophrenia spectrum disorders In the pandemic/post-pandemic when the pandemic lowered by 10% the psychological wellness among adolescents worldwide. Shukla and Upadhyay (2024) explored the impact of the pandemic on adolescents' psychosomatic problems. They found that sleep problems continued to be the most common problem in the post-pandemic, followed by stomach ache and feeling low, dizziness, irritability, appetite loss, tension, and difficulty concentrating. Kiran et al. (2024) even demonstrated that cardiac arrests reported in the post-pandemic increased significantly because the COVID-19 pandemic has profoundly impacted global

healthcare systems. Ning et al. (2024) analysed mental health challenges encountered by Chinese university students in the post-pandemic era and indicated that sleep difficulties, anxiety, and stress were the primary mental health challenges experienced by students.

Additionally, Burcu et al. (2023) advocated that the pandemic affected working conditions, leading to uncertainties and disruptions in supply chains. During the post-pandemic period, some industries even slowed down significantly. Igiehon et al. (2024) claimed that the COVID-19 agricultural food production was influenced even in the post-pandemic, thus challenging food security across the world and contributing negatively to food supply and demand .Furthermore, Nobre et al. (2023) found that the transition to remote learning imposed by social distancing during the COVID-19 pandemic affected the lives of students, educators, and families, impacting the teaching-learning process. The limited economic conditions of a large part of the population were exacerbated, which increased difficulties in accessing the internet and the media necessary for this adaptation in the post-pandemic. Even worse, Sohu and Chaudhary (2024) agreed that the overuse of smartphones caused poor academic performance and increased BMI, physical symptoms (finger/hand pain, back pain, general fatigue, vertigo, lack of physical activity), and psychological symptoms (craving for phone use, nomophobia, poor quality sleep).

Furthermore, COVID-19 has caused variation in the economy worldwide, affecting various sectors, which resulted in reduced economic growth and high unemployment on average (Astro et al., 2022). For example, airports needed to face the challenges in post-pandemic operations, such as massive flight delays, operational disruptions, and a shortage of trained staff (Kaz et al., 2022). Besides, Canova and Bello (2024) found that the pandemic negatively impacted the health of working women and catalysed various trends in the world of work and changes in technology that may pose threats or opportunities for women when coming with the increasingly widespread use of technologies such as the Metaverse, Big Data or Artificial Intelligence. Toleikienė et al. (2024) even revealed the main challenges of e-leadership in the post-pandemic municipal administrations. They highlighted the use of remote work and e-leadership in municipal administrations after the pandemic heavily depends on the attitudes of supervisors toward work productivity.

Based solely on the results revealed by the above research, it seemed that the pandemic only brought negative impacts in the post-pandemic period. However, the pandemic had proven to bring various negative and positive challenges. Among them, the most frequently mentioned one was the impact of information technology application or technological transformation. Li (2024) agreed with the positive guiding relationship between the digital economy and economic recovery, clarified the key role that the digital economy plays in accelerating global economic development, and discovered the challenges in the process of moving forward through the accelerated development trend of the digital economy in the post-pandemic era. Bala (2024) proposed that the pandemic had drastically changed the use of digital technologies in education due to the social distancing norms and nationwide lockdowns. Simultaneously, Cahyono et al. (2024) also recognized that the COVID-19 pandemic had led to a massive shift from traditional teaching to online settings. In response to the new learning milieu due to the COVID-19 pandemic, which implied that the use of various technological tools and strategies within the integration of hybrid and blended learning will likely continue in the post-pandemic era. Zhou and Ru (2024) assessed the impact of Liaoning's employment policies on talent flow and labour market equilibrium after COVID-19 and focused on incorporating digital transformation and ongoing educational initiatives. Ger and Patel (2024) also found that the COVID-19 pandemic had caused significant shifts in the Indian life insurance sector, including an increased focus on family financial security and a shift towards digital operations, which implied the accelerated digital transformation of the insurance sector and the role of government initiatives in promoting insurance penetration and inclusivity.

In addition, Ştefan and Ștefănescu (2024) revealed an increase in interest in sustainability performance of listed companies in Europe, both from the perspective of the reporting companies and in terms of the global average ESG score, during the COVID-19 pandemic and post-pandemic. Kong et al. (2024) adopted a transition design perspective to explore innovative strategies for enhancing spatial experiences in the post-pandemic era, underscoring the central role of sustainability in this process. Sharifi et al. (2024) believed that the development pathways for an ideal post-pandemic city would be a resilient city focused on pro-

environmental climate change mitigation and pro-urban resilience. Similarly, Nosike et al. (2024) claimed that the business landscape had undergone a profound transformation, necessitating a paradigm shift towards digitalization for sustained resilience and growth in the post-pandemic which showed the importance of digital transformation and underscored its role in enhancing resilience, adapting to unforeseen challenges, improving customer experiences, and facilitating data-driven decision-making. In other words, digital transformation and sustainability had also been well combined due to the pandemic.

Specifically, Yong et al. (2024) believed that Covid19 had caused changes in architecture, especially in the context of the security pandemic which supported future research in preventive measures in post-pandemic architecture, creating innovative building and green code certifications for security-pandemic theory or modifying the existing codes and green certifications. In other words, Zhao (2024) argued that traditional urban spaces were no longer able to meet people's demand for spatial openness because in the post-pandemic era, public open spaces could serve as new social spaces in neighbourhoods, effectively alleviate the pressure in public health, and promote economic recovery and development in the commercial economy. Bedi and Rahadi (2024) investigated the shifting trends in post-pandemic housing preferences and their impact on residential decision-making and revealed an increased emphasis on home office spaces and adaptable layouts as a response to the pandemic's transformative influence.

Apart from the architecture, Chissom (2024) explored post-pandemic trends in hospitality trends and advised sustained investment in digital infrastructure and training for staff to maximize the benefits of contactless technologies, including government support for technological adoption, promotion of domestic tourism, and the prioritization of sustainability through green practices and supportive policies. Therefore, Wolff and Larsen (2024) showed a general decline in worry and risk perceptions post-pandemic compared to those pre-pandemic in tourism.

Interestingly, Nosike et al. (2024) investigated alternative post-pandemic bureaucratic models and claimed that the Indonesian government needed to consider the post-bureaucratic model to initiate a transformative change in bureaucracy in response to the evolving challenges posed by the pandemic and its aftermath, which thrived on flexibility, citizen centeredness, open organizational boundaries, and a focus on people.

The impact of the pandemic on the world is multi-faceted, with both positive and negative impacts. In particular, government departments played an extremely important role during or after the pandemic. Therefore, this article intended to collect relevant literature and statistical data, construct a research model of the information asymmetry, test the hypotheses of the government interventions, the adverse selections, and the moral hazards, and explore the impact of the government intervention on the information asymmetry in Taiwan's credit card market in the post-pandemic.

LITERATURE REVIEW

Government Interventions

COVID-19 was essentially a public health issue. However, to prevent the spread of the pandemic, the response measures adopted by various countries, including blockades, social distancing and working from home, had severely impacted various industries. In particular, the disruption of supply chains ultimately led to increased unemployment rates and a sharp decline in economic growth rates. Just like fighting the spread of the epidemic in the early stages of the outbreak, government departments had even greater responsibility in the post-pandemic era to recover the economy and rebuild the global supply chain. For example, Kaggwa et al. (2023) presented a comprehensive review of the post-pandemic economic recovery in the United States, focusing on the efficacy of various recovery strategies and policy interventions. The study identified key themes, such as the impact of government interventions, private sector adaptations, digital transformation, and the shift towards sustainability. Above all, fiscal stimulus packages and monetary policy adjustments had been crucial in stabilizing the economy, while businesses had innovated and digitized operations to adapt to new economic realities. Yang (2024) aimed to examine the fiscal and monetary policies enacted by the G7 countries in the post-COVID-19 era and also empathize comparative evaluation of monetary strategies—such as interest rate cuts and quantitative easing—and fiscal measures—such as

direct payments, loan guarantees, and tax deferments, to investigate their impact on economic recovery. Altunyan et al. (2021) studied the instruments of stabilization policy during the pandemic and post-pandemic economy, identifying measures aimed at reorienting from ensuring monetary and budgetary stability to expanding effective demand and stimulating the economy and directly showed that in developed countries, support measures by monetary policy instruments were limited, so for the most part, fiscal mechanisms to support the population and business were implemented. The result was recognized by Syukur (2024), who highlighted taxation's critical role as a revenue-generating mechanism for governments facing post-pandemic fiscal deficits. Additionally, D'Orazio (2021) also aimed to explore post-pandemic financial measures which were designed to support bank lending, boost financial markets' liquidity, reduce banks' funding liquidity costs, and allow for a smoother transition in monetary and fiscal policies.

As to the labour market, Kostrytsia and Burlay (2021) highlighted the resilience system involved with the efficiency, balance and sustainability of national labour markets and the employment sector as a whole, which had a devastating effect on the pandemic. Zhou and Ru (2024) agreed with the importance of studying talent migration lying in its strategic role, particularly for post-pandemic recovery and global adaptation, and recommended further enhancements to these policies, focusing on the incorporation of digital transformation and ongoing educational initiatives. Therefore, because the COVID-19 pandemic catalysed a significant shift towards remote education, necessitating rapid innovations in educational technologies and methodologies, alongside substantial adjustments in public policy, Li (2024) studied the evolution of remote education during the post-pandemic period, and recognized the corresponding shifts in public policy aimed at supporting these developments, including reforms in funding, data security, and regulatory adjustments. Similarly, Rifa'I and Surakarta (2023) focused on the problems in the implementation of online learning policies during the COVID-19 pandemic or what the recommendations of researchers were for post-pandemic learning policies and claimed that it was necessary to take the post-pandemic policies as follows , such as increasing the capacity of educators , optimizing the support of educational stakeholders through socialization, equitable distribution of student readiness in distance learning and improving the supporting facilities and infrastructure. Gao and Liu (2022) even highlighted the urgent demand for policy innovation on university internationalization at the regional, national, and institutional levels in response to the changing global field in the post-pandemic era.

Tourism was one of the industries hardest hit by the pandemic. The recovery and reconstruction of the tourism industry in the post-pandemic period is even more urgent and necessary. Therefore, Gowreesunkar et al. (2022) proposed that rebuilding tourism required policies that addressed structural weaknesses, advanced key priorities, fostered global solidarity and took advantage of new opportunities. The tourism policies in the post pandemic included seven pillars: mitigation, vaccination, collaboration, information, promotion, education and investigation. Furthermore, Prasetya et al. (2022) optimistically stressed that the Covid-19 Pandemic also provided opportunities and time for the government to rearrange tourism institutions to be even better ,even if the pandemic caused the tourism sector to experience a significant decline and suggested that the tourism industry should strengthen the efforts in four stages of action plans, namely human and institutional development, destination quality development, marketing development, and strengthening the tourism industry structure.

However, the measures might be beneficent to the industry development and economic recovery, but they were verified to be not aligned with the goals of the Paris Agreement (D'Orazio, 2021). Nevertheless, Yi et al. (2021) thought it essential to provide a platform for making policy adjustments and transformations to promote the realization of SDGs in the post-pandemic era, even thought the COVID-19 pandemic had cast a shadow on the implementation of the Sustainable Development Goals (SDGs). Therefore, in the post-pandemic era, particular attention should be given to integrating SDGs and achieve synergy among goals, concretizing short-and medium-term priorities toward the SDGs targets for all countries, strengthening multilateralism and global cooperation among countries and continents, providing reliable data and approaches for real-time impact assessment and process monitoring, and promoting an inclusive engagement and integrative implementation with multiple stakeholders and consortiums. As long as the discussions on the information asymmetry, adverse selection and moral hazard were reviewed, it was not difficult to find that SDGs became an issue of global concern in the post-pandemic.

Adverse Selections

García et al. (2015) analysed the example of adverse selection of reviewers when a potential referee whose ability was his private information faces a finite sequence of review processes for several scholarly journals and recognized that adverse selection occurred when a firm signed a contract with a potential worker but his/her key skills were still not known at that time, which caused the employer to make a wrong decision. However, it was undeniable that adverse selection still existed most often in the insurance market. For example, Fischer et al. (2023) presented robust evidence on adverse selection in hospitalization insurance for low-income individuals that received first-time access to insurance and revealed substantial selection in individual policies, leading to welfare losses and the threat of a market breakdown. Browne (1992) tested the market for individual health insurance to determine if adverse selection was present and found that low-risk consumers purchase less insurance in the individual market than in the group market, which was consistent with adverse selection existing in the individual market for insurance. Yang and Zhong (2023) claimed that the risks covered by maternity insurance are essentially different from other social risks because fertility behaviour can be planned, which led to the result that the higher the proportion of female employees in small and micro enterprises, the more inclined enterprises to adversely selection into maternity insurance. Apparently, the younger the average age of employees, the more serious the adverse selection. Therefore, Neudeck and Podczeck (1996) promoted various ways to regulate the health insurance market and provided an answer to the problem of adverse selection, including either effectuate some cross-subsidization of insurance policies within the state sector or grant private insurance firms an exclusive right to serve certain groups of the population.

Additionally, because risk-neutral insurers needed to face aggregate (undiversifiable) risk, Smith and Stutzer (1990) demonstrated that agents with low loss probabilities signalled their type by sharing aggregate risks with their insurers in adverse selection and aggregate uncertainty. Doherty and Thistle (1996) showed that the private value of information is non-negative only if insurers cannot observe consumers' information status or if consumers can conceal their informational status and assume adverse selection of the risk type known to the consumer but not to the insurer. Furthermore, Cohen and Siegelman (2010) examined the basic coverage–risk prediction of adverse selection theory which recognized that policyholders who purchased more insurance coverage tended to be riskier. In other words, a coverage–risk correlation was explained either by moral hazard or adverse selection.

In addition to the insurance market, Cao and Gruca (2005) proposed how to target prospects who were likely to respond and be approved based on firm's customer relationship management system because adverse selection had been an important problem for marketers. Simultaneously, Dzukou and Nzongang (2023) analysed the effect of Customer Relationship Management on reducing adverse selection within microfinance institutions in Cameroon and indicated that a quality welcome and personalized support had effects on reducing adverse selection. Especially, Pauly and Nicholson (1999) inquired why the turnabout in public opinion about managed care had been especially striking and found that the policy process needed to address the much more vexing question of who should gain and who should lose, with the total approximately constant. In a word, the source of this difficult problem, as with so many other problems in health insurance, was adverse selection.

Moral Hazards

As to the definition or explanation of the moral hazard, San-Jose et al. (2022) demonstrated that moral hazard in an organization occurs when people made decisions and take a high risk for their benefit, given that they would not have to bear all the negative ensuing consequences should they occur. Mohd et al. (2024) identified the main factors that drove moral hazard behaviour in all industries and pointed out the major sources of moral hazard behaviour, such as lack of incentives, information asymmetry, legal and regulations, high market power, temporary ownership, and cultural behaviour. Mccaffrey (2016) proposed that there was a long-standing controversy over its moral implications, though moral hazard was a well-known economic concept. Therefore, a moral dimension of behaviour under moral hazard was explained directly, namely, the violation of property rights.

In addition to clarifying the definition of moral hazard, more research focused on the occurrence of moral hazard in various industries and countermeasures. As with studies on adverse selection, the insurance and financial industries were still the most commonly cited industries for moral hazard. Firstly, Lin and Hsu (2024) investigated the effect of both voluntary private health insurance and compulsory social health insurance on the utilization of medical care services under Taiwan's universal mandatory National Health Insurance scheme and found substantial moral hazard in both voluntary and mandatory additional health insurance. Suryanto et al. (2023) asserted that moral hazard was a crucial issue in insurance not only in developing countries but also in developed countries and discovered the cause of moral hazard on the implementation of crop insurance in Indonesia if farmers were covered by crop insurance. Rakviashvili and Shamugia (2023) studied the moral hazard in healthcare. They compared the length of stay of inpatients funded under government programs with the cases covered by a pocket of patients or private insurance companies, which resulted in an increase in the moral hazard under the government healthcare program.

In reality, the financial industry was no less affected by moral hazard than the insurance industry. Brady et al. (2024) claimed that dominant decision-makers engaged in moral hazard behaviours because they tended to prioritize outcomes over processes, which led to catastrophic consequences, as seen in the 2008 global financial crisis after hedge fund managers indiscriminately invested their clients' money in subprime mortgages. Chang et al. (2024) analysed the foundation of the Economic and Monetary Union (EMU), due to the Eurozone's sovereign debt crisis, which was destabilized by disagreement on unconventional monetary policies (UMPs), specifically government bond purchases and undermined the prior objective of the EMU of avoiding moral hazard. Similarly, Pierret and Howarth (2023) recognized that avoiding moral hazard was a recurrent argument of those seeking to limit the development of European financial support mechanisms. However, in reaction to the COVID-19 pandemic, Germany supported an EU response that included grants and massive debt issuance because German policymakers were discursively constrained by one of the dominant meanings of moral hazard they had previously imposed. Jovic (2023) assessed moral hazard as the average difference between the better rating of a client in a bank and the most conservative rating of the same client in the banking sector and revealed that state-owned banks and foreign privately-owned banks with evident problems at the level of their headquarters had higher values of this quantitative indicator of moral hazard.

Furthermore, Alam (2023) argued that a principal-agent relationship between citizens and public policymakers resulted in a loss in public goods and services to citizens, signalling a meaningful level of moral hazard problem in public policymakers as agents. Simultaneously, Acharya et al. (2024) viewed the relationship between politicians and voters as a principal–agent interaction afflicted by moral hazard. When moral hazard binds, the optimal way for voters to hold politicians accountable is to provide re-election incentives that evolve dynamically over their careers in office.

Especially, moral hazard was also closely related to ecological protection and climate change. For example, Lean (2024) proposed that synthetic biology had immense potential to ameliorate widespread environmental damage. However, the promise of such technology could be argued to potentially risk the public, industry and governments, or even worse exploited the possibility of this technology to do further damage. In other words, the risk was often couched as an objection to new technologies, producing a moral hazard. Similarly, Schoenegger and Kian (2024) argued that solar radiation management (SRM) might help reduce climate change's negative outcomes by minimizing or reversing global warming. However, many studies expressed the worry that SRM might pose a moral hazard, causing a reduction in climate change mitigation efforts. Even worse, though the public support is crucial for a rapid upscaling of carbon removal and sequestration, public support for these negative emissions technologies (NETs) could be hampered by a moral hazard (Sloot & Bostrom, 2024).

PROPOSED MODEL AND HYPOTHESES

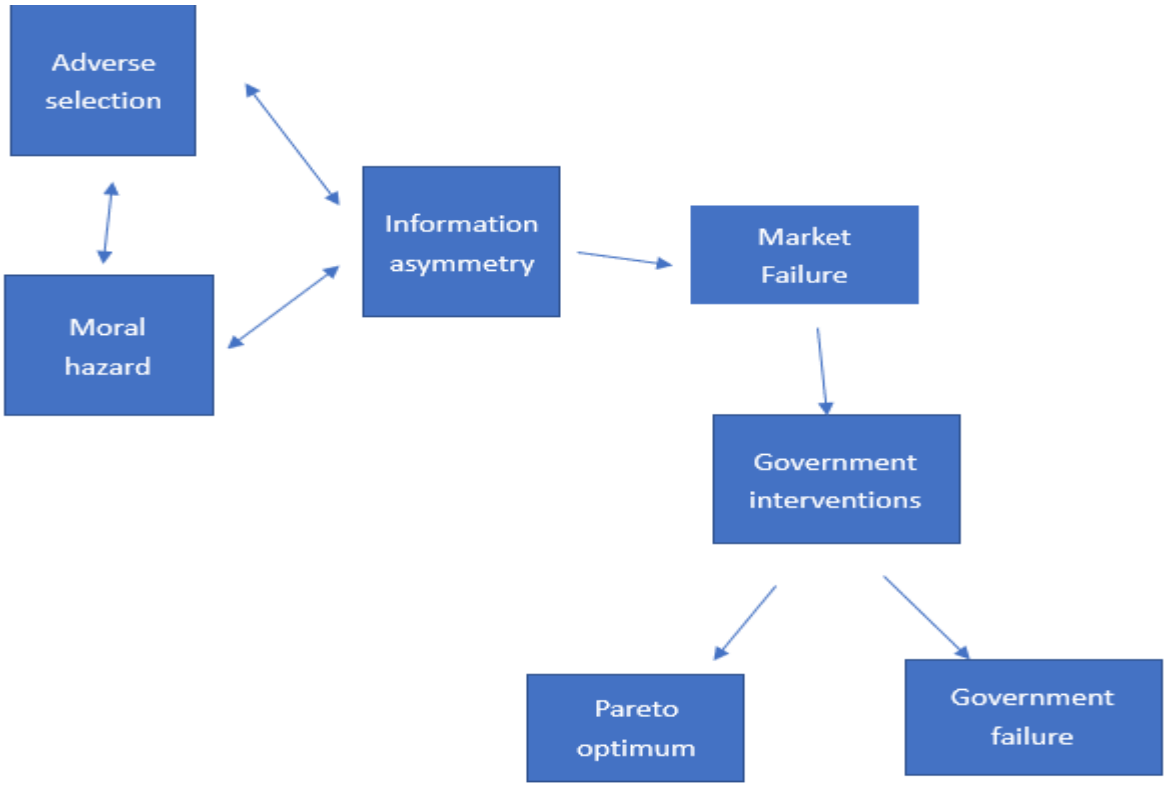
Proposed Model

To explore the impact of the Covid-19 on the credit card market in Taiwan, the article focused on collecting all various kinds of data to construct the information asymmetry model (see Figure 1). Based on

the literature review above, both the adverse selection and moral hazard were combined into the information asymmetry. They interacted with each other or individually affected the information asymmetry.

Just like the externalities, public goods and natural monopoly, the information asymmetry was also one of the main reasons for the market failure. To reduce the loss of the social welfare caused by the market failure, and even pursue the Pareto optimal under the most efficient allocation of resources, the government intervention had become the main alternative. Therefore, this article also incorporated the government intervention into the model to explore its impact on the information asymmetry in Taiwan's credit card market during the post-pandemic.

FIGURE 1
INFORMATION ASYMMETRY MODEL



Hypotheses

To achieve the goal, the article was based on the government intervention, the adverse selection and the moral hazard to separately design the research hypotheses as follows:

Hypotheses of the government intervention:

- ***H 1:*** *The expansionary monetary policy was adopted in the post-pandemic.*
- ***H 2:*** *The expansionary fiscal policy was adopted in the post-pandemic.*

Hypotheses of the adverse selection:

- ***H 3:*** *The adverse selection existed in the post-epidemic credit card market.*

Hypotheses of the moral hazard:

- ***H 4:*** *The moral hazard existed in the post-epidemic credit card market.*

RESULTS AND DISCUSSIONS

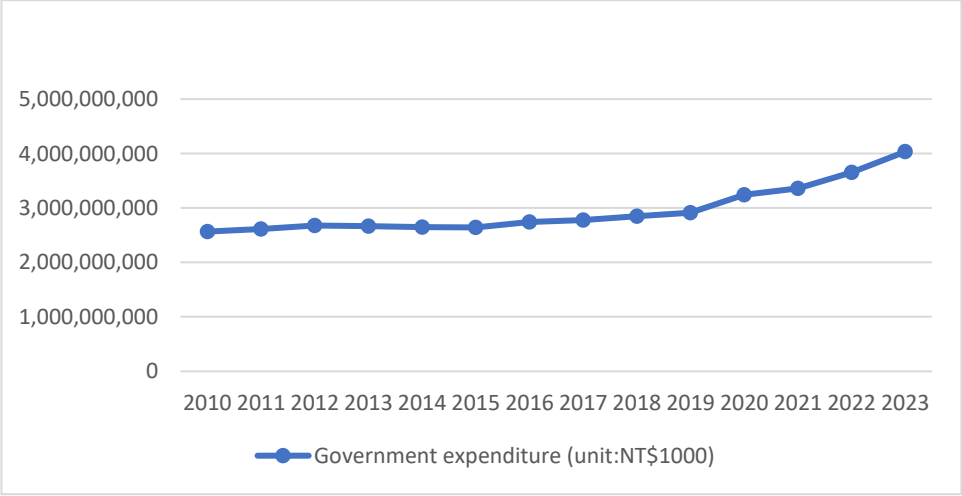
Government Interventions

Fiscal Policies

Since the pandemic outbreak, the fiscal policies of the major countries worldwide had mainly focused on the disaster reduction, increasing the pandemic prevention expenditures, vaccine research and development, etc. In the post-pandemic period, the policies were focused on providing the loan guarantees and relief to the industries and enterprises affected by the epidemic, providing the direct financial assistance to the affected families, and delaying or slowing down the relevant tax payment deadlines or amounts to support the economic recovery.

Faced with the impact of the pandemic, Taiwan's fiscal policy response was no exception. For example, in order to accelerate the post-epidemic recovery, maintain the momentum of the economic growth, and share the fruits of the economic development with the whole people, the universal cash distribution was implemented. In addition, in response to the impact of the international political and economic changes after the pandemic, the government supervised the public banks to jointly launch the "100 billion small and medium-sized enterprise revitalization financing plan" to provide loans with their own funds to support the micro, new enterprises, and small and medium-sized enterprises after the epidemic. On the other hand, the public banks cooperated with the various ministries and agencies to formulate the relief and revitalization measures, continued to promote and strengthen the relevant relief loan supporting measures, and helped the companies or individuals affected by the COVID-19 epidemic tide over the difficulties. Finally, the tax assistance measures were provided. The tax obligors affected by the COVID-19 epidemic and unable to pay their taxes within the prescribed payment period might apply for an extension or instalment payment within the prescribed tax period per regulations. According to the figure (2), since the outbreak of the pandemic, the government authorities had indeed shown a loosening trend in the fiscal policy. Therefore, H1 is supported.

FIGURE 2
THE GOVERNMENT EXPENDITURE OF FISCAL POLICIES



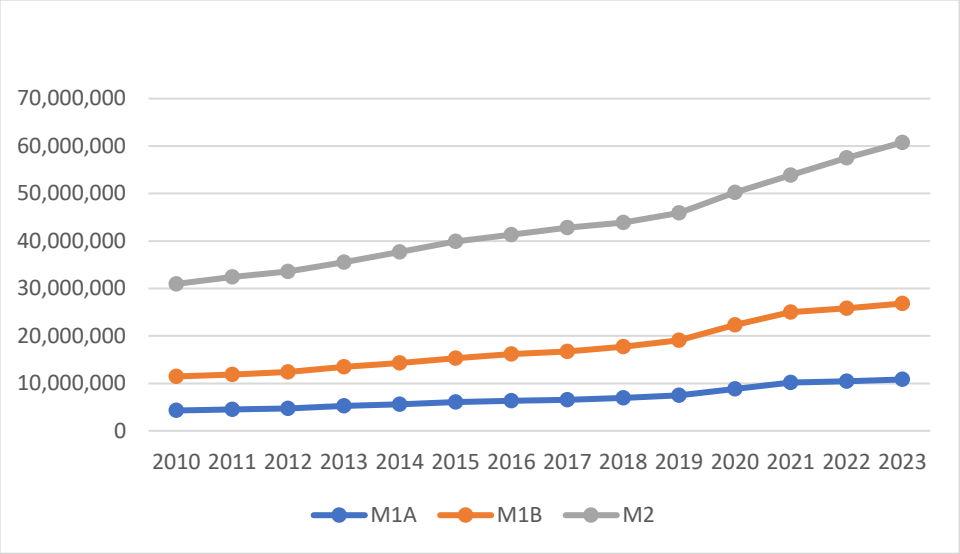
Monetary Policies

Given the limited room for the interest rate cuts, after the outbreak of the COVID-19 crisis, the major central banks not only quickly lowered the interest rates, but also expanded the asset purchase plans or what was generally known as the quantitative easing (QE) measures, and accelerated the bond purchases. Under this circumstance, the ratio of the major central banks' assets to GDP had risen sharply, reaching approximately 4 to 6 times that before the outbreak of the global financial crisis. The expansion rate during

the COVID-19 crisis was even much higher during the global financial crisis. In addition, to provide the broader financing for the financial system and strengthen the liquidity support for the real economy, the major central banks had also launched a wide range of credit financing mechanisms for the small and medium-sized enterprises.

Faced with the pandemic, the first response measures taken by Taiwan's central bank were to lower the interest rates, including lowering the discount rate, guaranteed lending facilities rates and short-term financing rates. Then the bank financing project was launched to help alleviate the operating difficulties of the small and medium-sized enterprises. In addition, to maintain the loose market funding, the central bank would expand the repo operations, reduce the sterilization funds, and issue the fewer certificates of deposit, which would keep excess reserves above NT$100 billion. All of this had provided the sufficient liquidity for the financial market, causing the three indicators of the expansionary monetary policy to show a simultaneous upward trend since the pandemic outbreak (see Figure 3). Therefore, H2 is supported.

FIGURE 3
MONEY SUPPLY: M1A M1B M2



Adverse Selections

In response to the card debt crisis, the Banking Law revised in 2005 stipulated that the maximum recurring interest rate of the credit cards should not exceed the annual interest rate of 15%. The card-issuing banks also implemented differential interest rates at different levels based on the cardholder's credit rating. Based on Table 1, except for the Bank of Taiwan, the highest circulating interest rates of the other public and private banks were close to 15%. However, the further analysis found that the proportion of users within the public banks using the highest revolving interest rate was less than 15%, but the proportion of users within the private banks with high revolving interest rates was not only much higher than that of the public banks, even close to 50%. In other words, although the difference in the highest revolving interest rates between the public and private banks was not obvious, judging from the proportion of users with the highest revolving interest rate brackets, the highest revolving interest rates applicable to the private banks were still much higher than those of the public banks.

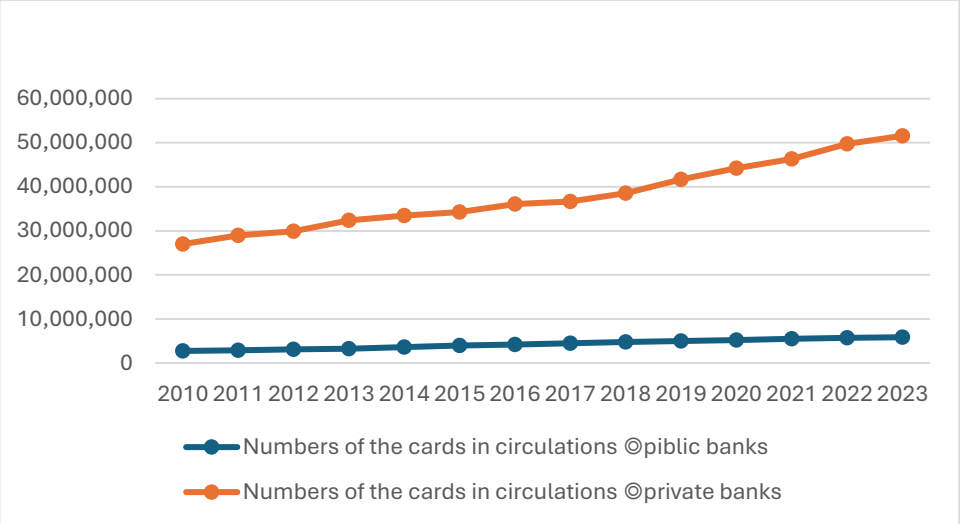
TABLE 1
THE MAXIMUM CREDIT REVOLVING INTEREST RATE AND THE PROPORTION OF USERS WITH HIGH CREDIT REVOLVING INTEREST RATES IN THE PUBLIC AND PRIVATE BANKS

	Maximum credit revolving interest rate (%)	Proportion of users with high credit revolving interest rates （＞11.875）
Bank of Taiwan	11.875	14.26
Land Bank of Taiwan	15	4.13
Taiwan Cooperative Bank	14.75	13.00
Chang Hwa Commercial Bank	15	44.87
Cathay United Bank	15	30,20
CTBC Bank Co., Ltd.	15	21.59
E.Sun Commercial Bank, Ltd.	15	23.29
Taishin International Bank	15	41.17
Taipei Fubon Commercial Bank Co., Ltd.	15	31.92
Union Bank of Taiwan	15	20.35
HSBC Bank Limited	15	40.36
Far Eastern International Bank	14.99	49.58

Numbers of the Cards in Circulations

According to Figure (4), whether it was a public or private bank, their numbers of the cards in circulation had shown an upward trend during and after the pandemic. This trend was consistent with the policy goals of the various countries since the outbreak of the pandemic to encourage the digital transformation and information technology applications to prevent the spread of the pandemic. Compared with the public banks with the lower interest rates, the numbers of the cards in circulation in the private banks with the higher interest rates had shown a sharp increase in the post-pandemic, which had exactly proved that Taiwan's credit card market produced the adverse selection between the public and private banks in the post-pandemic. Therefore, H3 is supported.

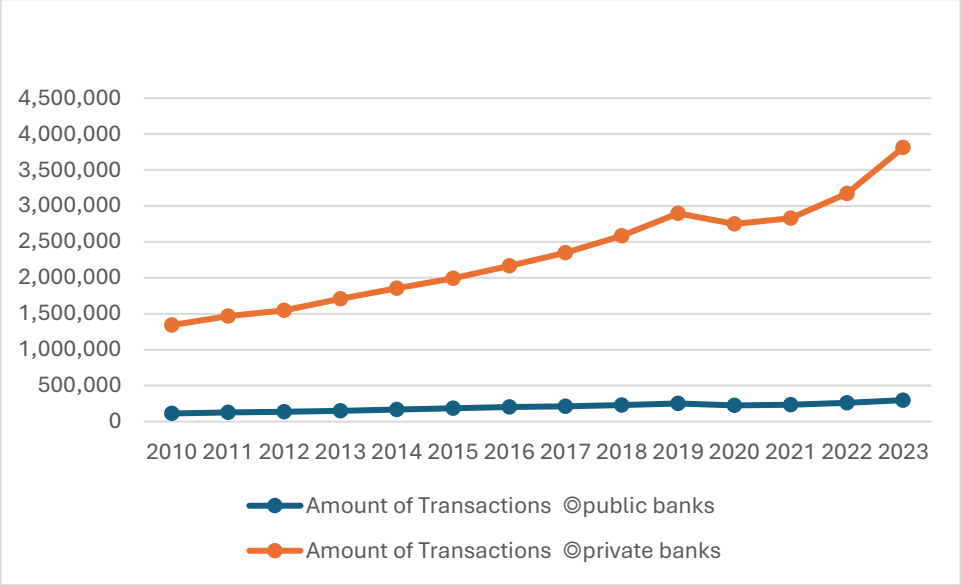
FIGURE 4
THE NUMBERS OF THE CARDS IN CIRCULATIONS IN PUBLIC AND PRIVATE BANKS



Amounts of Transactions

Compared with the numbers of the cards in circulation, the amounts of transactions could more directly show the cardholder's use of the credit card. According to Figure (5), the trends in amounts of transactions in the public and private banks were almost consistent with the number of cards in circulation. In the same way, compared with the public banks with the lower interest rates, the amounts of transactions in the private banks with the higher interest rates, in addition to declining in 2020, showed a sharp increase the next year, even exceeding the level before the outbreak. Again, compared with the relatively stable trend of the public banks, the explosive growth in transactions of the private banks indeed confirmed that Taiwan's credit card market would produce the adverse selection between the public and private banks in the post-pandemic. Therefore, H3 is supported.

FIGURE 5
THE AMOUNTS OF TRANSACTIONS IN PUBLIC AND PRIVATE BANKS

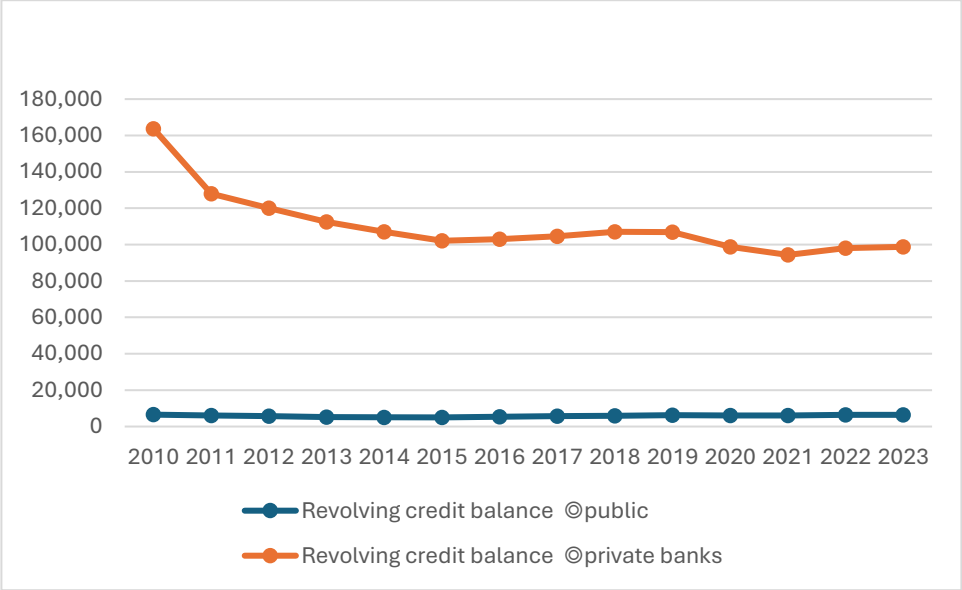


Moral Hazards

Revolving Credit Balance

If the adverse selection was the "ex-ante" concept of the information asymmetry, the moral hazard was the "ex-post" result of the information asymmetry. In other words, the information asymmetry could be completely constructed by combining the moral hazard with the premise that the adverse selection already existed. Therefore, the revolving credit balance had become an important indicator for examining the moral hazard. The cardholders needed to bear the high interest rates if they chose to use the revolving credit balance. The high interest burden became the price that the cardholders paid for choosing the credit instruments with the high interest rates. In other words, if the revolving the credit balance of the credit card market also showed the same trend under the premise with the high numbers of the cards in circulation and high amounts of transactions, it would not only prove the existence of the moral hazard, but also complete the information asymmetry phenomenon of the credit card market. According to Figure (6), while the revolving credit balance of the public banks had been in a stable and low trend for a long time, the private banks had gradually risen after hitting the bottom in 2021. It showed that Taiwan's credit card market had created the moral hazard among the public and private banks in the post-pandemic. Therefore, H4 is supported.

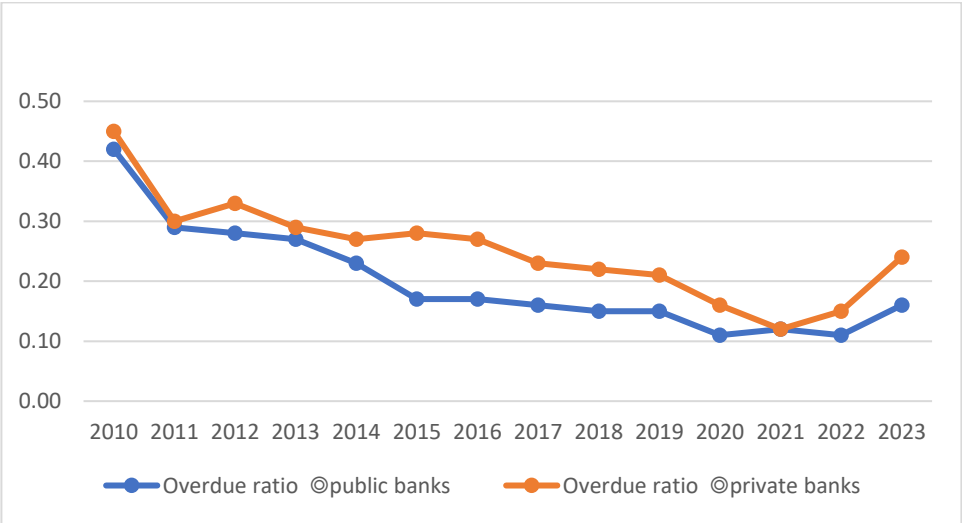
FIGURE 6
THE REVOLVING CREDIT BALANCE IN PUBLIC AND PRIVATE BANKS



Overdue Ratio

In addition to the revolving credit balance, the overdue ratio could directly indicate whether the adverse selection resulted in the moral hazard under the information asymmetry. Because the overdue ratio not only caused the card-issuing banks to lose the interest income, but even led to the failure to recover the principal of the revolving credit balance. Figure (7) clearly showed that after the epidemic in 2021, the overdue ratio of the public and private banks rarely crossed, but they both rose rapidly in 2023. Among them, the overdue ratio of the private banks increased even more than that of the public banks. It could be seen that Taiwan's credit card market had created the moral hazard among the public and private banks in the post-pandemic. Therefore, H4 is supported.

FIGURE 7
OVERDUE RATIOS IN PUBLIC AND PRIVATE BANKS



Summary

According to the results of the above discussions, H1, H2, H3 and H4 were all supported. When H1 and H2 were supported at the same time, it seemed that the government intervention indeed played a positive role in the post-pandemic. However, when H3 and H4 were supported, it showed that the information asymmetry of Taiwan's credit card market worsened during the post-pandemic. Therefore, if the government intervention was included in the deterioration of the information asymmetry of Taiwan's credit card market after the pandemic, the effect of the policies employed by the government during the post-pandemic had indeed reached the point where it was necessary to carefully evaluate it. In other words, the empirical results had proven that the government intervention failed to improve the market failure and instead caused the government failure, which was different from the situation when the card-debt crisis occurred in 2005.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The information asymmetry leads to the market failure, which will prevent the market price mechanism from achieving the most efficient allocation of resources, resulting in the lower social welfare. Therefore, the government intervention becomes necessary to improve the market failure. It's just that the government intervention is always accused of violating the principles of the free market mechanism. The improper government intervention not only fails to improve the social welfare, but can even lead to the government failure and further worsen the market failure. Therefore, the use and efficiency of the government intervention are often strictly scrutinized to avoid the government failure.

The empirical results indeed revealed that due to the impact of Covid-19, the market mechanism had been unable to operate normally, and the information asymmetry in Taiwan's credit card market had even worsened due to the interaction between the adverse selection and the moral hazard. This is the first time since the card-debt crisis occurred in Taiwan in 2005 that the information asymmetry with the credit cards had reversed after the successful government intervention (Chang, 2022).

In fact, when many countries had already reviewed whether the excessive use of the monetary and fiscal policies during the pandemic caused the economic recovery of the various countries less than expected in the post-pandemic, it coincided with the conclusions in this article. By analysing the trend of the information asymmetry in Taiwan's credit card market, this article had repositioned the true role of the government intervention in the post-pandemic, which had been different from the situation when the card-card crisis occurred in 2005.

Recommendations

The results of this article showed that the government intervention involving the monetary policy and fiscal policy in Taiwan's credit card market during the post-pandemic period not only failed to change market failure but might instead lead to the government failure or worsen the market failure. However, this article was a qualitative research using the document analysis method to collect and conduct an inductive analysis of the relevant documents and secondary data. In addition to being limited in the breadth and depth of the collected literature, the article suggested to extend the observation period, which might make the conclusions obtained from the trend analysis more valuable for the policy formulation in the future.

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