Examining the Role of Government Intervention in Market Failure and Government Failure

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This study investigated the role of government intervention in market failure and government failure during the card debt crisis in Taiwan. To achieve this goal, data related to information asymmetry was collected and combined with adverse selection and moral hazard data to confirm if market failure existed. Based on the confirmation of market failure, the study examined if government interventions could improve the market failure or, conversely, lead to government failure. Through constructing the research model and testing the research hypotheses related to market failure and government failure, the results showed that government interventions were essential to solve the card debt crisis under information asymmetry or market failure. The conclusions also implied that policymakers needed to employ resilient responses to improve the crisis in time, but never fell into the controversies of liberalism or protectionism.

Keywords: government intervention, market failure, government failure, card debt crisis, information asymmetry, advice selection, moral hazard

INTRODUCTION

In 2005, following South Korea and Hong Kong, Taiwan also experienced a card debt crisis, which not only triggered a local financial crisis but also had a serious impact on the society and the economy (Chang 2022). Faced with a tsunami-like credit card debt crisis, countries put forward countermeasures, hoping that the negative impact could be minimized. Many studies also explored the possible factors causing the crisis from the theoretical and practical perspectives, hoping to gain experience and lessons from it so as to avoid a recurrence. Among these factors, market failure caused by information asymmetry should be the most widely employed theoretical source to explain the financial crisis caused by the card debt. In other words, if the credit card debt crisis in Taiwan could be understood as the result of market failure under information asymmetry, then government intervention would become one of the options to avoid market failure. Therefore, when market failure occurred, the market mechanism lost the function of efficient allocation of resources and reduced social welfare. However, it was a pity that the competent authorities were undecided about adopting government intervention and even missed the best time to respond immediately (Chang et al. 2022). Apparently, different views on whether to support or oppose government intervention in response to the financial crisis existed among policymakers. The purpose of this study was to search for the optimal situation when government intervention could be involved in improving the card debt crisis in Taiwan.

The following studies are associated with supporting government interventions. For example, Suleymanov and Alirzayev (2013) investigated the government's role in the Global Financial Crisis and

found that more than 30 years of deregulation and reliance on self-regulation by financial institutions was the one overarching reason for the crisis. Therefore, while financial crisis turned into social and economic turmoil it became government prior issue to solve. Jardim (2013) also recognized the Brazil government's involvement in controlling the crisis and by the pension fund sector and its strategies during the economic crisis and emphasized the construction of a discourse emphasizing the importance of state regulation (as opposed to market self-regulation), and the central role of pension funds during the process. Likewise, the 1997/98 financial crisis forced the Indonesian government to inject capital into selected banks, introduce deposit insurance, and change capital requirements. The results revealed that liquidity risk was reduced when the government and owners contributed additional capital, and credit risk was lowered as the government removed bad loans from problematic banks (Agusman et al. 2014). Moreover, Yang et al. (2019) indicated that the 2008 global financial crisis triggered a reconsideration of the banking system as well as the role of government intervention. Measuring bank efficiency and examining the relationship between regulation, supervision, and state ownership in commercial banks, the findings showed that tighter regulation and supervision were significantly related to higher efficiency for small and large-sized banks.

Moreover, Wang and Li (2022) demonstrated that there were five significant determinants of economic resilience: income inequality, innovation, government intervention, human capital, and financial development. This finding provided evidence for the government to design region-based policies that take into consideration the size and resources of a region's economy in order to build a resilient wall to defend it against external shocks and provide a basis for sustainable development. Novokmet (2021) studied the global financial crisis as well as the unpegging of the foreign exchange rate of the Swiss franc (CHF) against the euro, which amplified the repayment troubles of households with outstanding CHF-linked debt and supported the critical assessment of the Croatian government and central bank intervention. This might be useful for the timely recognition of universal threats from the exotic currency-linked loans for the systemic risk and financial stability, and for minimizing the negative externalities from probable debt relief measures. Similarly, though the European Monetary Union (EMU) had experienced growing financial instability culminating with an extended sovereign debt crisis that had hit mostly the peripheral countries, Muratori (2015) stated that the relevance of policy interventions might reduce the contagion effect in the EMU.

Conversely, there were studies showing no support for employing government interventions. For example, though financial crises placed enormous pressure on national governments to intervene, increasing attention had been drawn to the negative long-run impact of government interventions on banks' behavior and the stability of the financial sector. Theoretical studies suggested that such government actions might result in an increased risk in the banking sector, destroying its long-run stability and imposing the danger of the next financial crisis since they led to the increased appearance of the phenomenon called "moral hazard." The results of the analysis even suggested that the use of market forces and regulations strengthening market discipline should best promote the performance and stability of the banking sector in the long run by reducing the scope of misuses and mistakes made by the protected institutions. On the other hand, government involvement in the banking sector would destroy the incentive system by encouraging banks to undertake increased risk (Hryckiewicz 2013). Examining how government intervention affected firm investment and investment efficiency, and focusing on the world's largest economic stimulus package (ESP) during the 2008 global financial crisis period, Deng et al. (2017) also suggested that government intervention could play a negative role in government-intervened firms. Sikorski (2011) analyzed the causes and effects of the financial crisis that commenced in 2008 and examined the dramatic government rescues and reforms. The outcomes of this, the most severe collapse to befall the United States and the global economy for three-quarters of a century, were still unfolding. Banks, homeowners, and industries stood to benefit from government intervention, particularly the huge infusion of taxpayer funds; however, their future was uncertain. Similarly, Chen et al. (2018) discussed the possible associations between financial inclusion and non-performing loans of commercial banks on the regional level and revealed a negative impact of financial inclusion on non-performing loans. Moreover, the development of the banking sector and regional consumption could enhance the impact of financial inclusion, whereas government intervention and unemployment could reduce the impact of financial inclusion. Even if the COVID-19 pandemic resulted in large government interventions in the banking industry, interventions—especially

longer and larger ones—would have no significant impact on prices but would increase costs, mostly due to higher loan impairment charges, lowering markups (Ten et al. 2021).

Furthermore, some studies even deemed that government failures were rooted in unsuitable government interventions. Davies (2011) indicated that though there was still no consensus on who or what caused a financial crisis that engulfed the world, beginning in the summer of 2007, a huge number of suspects had been identified, from greedy investment bankers through to feckless borrowers, dilatory regulators and myopic central bankers to violent video games, and high levels of testosterone among the denizens of trading floors. There was not even agreement on whether the crisis showed a need for more government intervention in markets, or less: some maintained that government encouragement of home ownership was at the heart of the problem in the U.S. in particular. Smrčka (2009) suggested that together with the commonly discussed causes of the economic crisis, an important role was played by long-term and continuous attempts of governments in developed economies to outpace the development of living standards in their respective countries in terms of the accessibility of own homes, thus outpacing the trends predetermined by the abilities of the national economies. In particular, Sharma (2004) even claimed that the Korean financial crisis of 1997 was simply the result of pervasive government intervention in the economy and that poorly sequenced and implemented financial liberalization contributed greatly to the scale and pace of the crisis.

However, even though government interventions received positive evaluation, especially during the financial crisis, some studies highlighted that some prerequisites or conditions needed to be further considered. For instance, Lin et al. (2019) evaluated the cross-border lending efficiency for a bank that participated in a government capital injection program (a government intervention used in response to the 2008 financial crisis) and suggested that government capital injection was an appropriate way to recapitalize the distressed bank by enhancing the bank interest margin and survival probability. Nevertheless, the government capital injection lacked efficiency when the bank's cross-border lending was high. Accordingly, Shimizu and Kim (2017) examined the effectiveness of various regulatory interventions on systemic risk during the financial crisis in Japan and recognized that the regulatory interventions worked effectively through the liquidity provision. However, the simple government intervention package to bail out distressed "too-big-to-fail" banks stabilized the banking system via the external channel, whereas the massive bailout scheme suffered the "too-many-to-fail" problem in the sense that it increased systemic risk through both direct spillover and external channels. The results implied that effective government intervention should be restricted to a limited number of bailouts to reduce systemic risk.

Similarly, exploring the recent financial crisis and the challenges it posed for government regulations, and examining the causes of the financial crisis in terms of moral hazard, corporate governance, systemic risk, and government policy, followed by an explanation of major public policies and programs developed to resolve short- and long-term problems resulting from the crisis, Liou (2013) argued that governmental financial reforms brought new challenges and concerns about the role of government in the market system and approaches to regulation, highlighting a number of transparency concerns. Considering the subprime-related 2007/2008 global financial crisis as a major economic challenge and given the tremendous bailout packages worldwide, Wagner and Breitenfellner (2010) discussed the role of governments as lenders of last resort and indicated that it was important not to suspend the market mechanism of bankruptcy via granting rescue packages because there appeared to be a need for improved risk awareness, more sophisticated risk management, and better alignment of interests among the participants in the market for credit risk. As such, examining the specific case of massive intervention by governments and, especially, central banks in monetary and financial markets to deal with the COVID-19 pandemic and mitigate its negative effects, Soto et al. (2021) offered a critical analysis of government tax policies and the increase in public spending—considered as the panacea and universal remedy for the social troubles—and concluded with a suggestion to change the mainstream paradigm, proposing a more sustainable and healthy economy.

It was no wonder that the recent global financial crisis led to a resurgent interest on the role that governments could play in the financial sector even if government interventions in the financial sector had prevailed in a number of countries since the early 1990s. When criticisms against financial repression and poor performance of public banks turned the tide against government intervention, the financial sector

reforms were introduced in several developing countries with the objectives of improving the allocative efficiency of financial institutions and financial markets (Arora 2017). Apparently, these studies fell into dispute between the two main economic doctrines—liberalism and interventionism—and concentrated on clarifying whether the recent events could be attributed to any of these two notions or, more precisely, to find the connection between them. To avoid events of this magnitude in future, Diacon (2013) suggested it was necessary to accurately identify the real causes and the valuable lessons that could be learned.

To identify the role of government intervention in market and government failure, it was needed to investigate the data further. Following the goal of the study, the rest of this article is presented as follows. First, a literature review presents works on information asymmetry, market failure, government interventions, and government failure. Based on the literature review, the research model is developed and related research hypotheses are presented. Then, the relevant hypotheses are tested for support or rejection in the discussion and results section followed by the conclusions.

LITERATURE REVIEW

Information Asymmetry

Information asymmetry usually exists in financial markets and creates negative effects on associated markets. Gen (2020) argued that because financial intermediaries are arguably an artifact of information asymmetry, financial intermediation provided a mechanism for information transmission that could reduce the degree of information asymmetry and, consequently, increase market efficiency. Yang and Shen (2022) empirically analyzed the impact of the shadow banking business (SBB) of non-financial enterprises (non-FEs) on the total factor productivity (TFP) of enterprises and recognized that alleviating financing constraints, reducing information asymmetry, and optimizing financial resource allocation might mitigate the negative effect. Yang et al. (2019) studied the crucial role of small and medium-sized enterprises in sustaining economic development in both developed and developing economies and found that under incomplete information, the transactions between SMEs and suppliers could serve as signals for banks, which might help banks access the private information of SMEs, thus reducing information asymmetry among them. Investigating the impact of AI on digital financial inclusion, Mhlanga (2020) discovered that AI had a strong influence on digital financial inclusion in areas related to risk detection, measurement, and management, addressing the problem of information asymmetry, availing customer support and helpdesk through chat-bots and fraud detection and cybersecurity.

In addition, examining the effects of access to public debt on corporate financing decisions in real estate investment trusts (REITs), Shen and Chau (2022) suggested that the introduction of credit ratings reduced information asymmetry and affected REITs' capital structure decisions and the level of cash holdings. It was also found that the overall risk perception level of equity investors was moderate and that the main factors affecting their risk perception aware information screening, investment education, fear psychosis, fundamental expertise, technical expertise, familiarity bias, information asymmetry, understanding of the market, etc. Therefore, efforts should be made to bring people with high risk perception to the low risk perception category by providing them with training to handle or manage high-risk scenarios, which would help in promoting an equity–investment culture (Singh and Bhattacharjee 2019). Furthermore, though liquidity was important for the stability of financial markets and the growth of national economies, the liquidity of financial markets might be influenced by country risk shocks through informational asymmetry, funding constraints, and portfolio rebalancing activities (Kunjal 2022). Especially, exploring the impact of investor sentiment on financial markets in China by taking the quantile causality test, Su et al. (2020) claimed that the authorities could sustain the stabilization of financial markets by reducing information asymmetry, guiding the rational sentiment of investors, and increasing effective regulations.

On the other hand, Hu et al. (2019) studied the generation of construction and demolition waste (CDW), which was a problem for societies aspiring to sustainability, and the result revealed that the information asymmetry as well as the "dynamic nature" of the CDW recycling market resulted in a number of barriers for the government to promote CDW recycling. To further promote the low-carbon and

sustainable development of China's power industry, Xin (2020) also suggested that information asymmetry, the limited rationality of the regulatory agencies, and private power sales companies in the regulation process made the regulatory effect uncertain to the detriment of sustainable regulation of the power industry. Likewise, Wang et al. (2022) proposed that corporate carbon information disclosure had the potential to promote corporate financing after the Green Climate Fund had played their part in climate finance and indicated that the more carbon information disclosure the lower the financing cost. In other words, this study affirmed the financing value of reducing information asymmetry and found that sustainable development (internal growth capacity) might increase the cost of debt.

Moreover, analyzing the relationship between the future cash flow forecast information provided by financial analysts and accounting information, Oh and Shin (2019) showed the results that information asymmetry between manager and investor could be reduced based on the rich information environment, and the analysts' cash flow forecasting information was expected to reduce the information asymmetry between the company and the investor, thereby increasing the transparency and sustainability of the firm. Yamada and Fujita (2022) investigated the impact of parent companies and other multiple large shareholders (MLSs) on the audit fees in Japanese firms, and highlighted that the level of audit effort was affected not only by audit risk from principal–principal conflicts, but also by the demands of key stakeholders because the key stakeholders of these firms tended to resolve information asymmetry problems through insider communication.

Simultaneously, Park et al. (2019) studied the effects of governance structure on the relationship between disclosure quality and credit ratings and found that greater divergence decreased the level of disclosure, thereby increasing the information asymmetry and agency problems, which ultimately might be harmful to firms' sustainability. Hence, examining whether fixed asset revaluation had an impact on the timelines and relevance of information disclosed in financial reporting, Bae et al. (2019) revealed that firms with unhealthy financial conditions and a high degree of information asymmetry showed an increase in crash likelihood after fixed asset revaluation. Therefore, Oh and Park (2022) also deemed that labor investment inefficiency due to information asymmetry was improved by excellent corporate governance and argued that in the case of the entire sample, the relationship between corporate governance and labor investment efficiency was significant in the positive direction.

More especially, Borrero and Mariscal (2022) studied new players who were entering the new and important digital data market for agriculture, increasing power asymmetries, and reinforcing their competitive advantages. The study reflected farmer's interests in participating in a centralized cloud data platform, preferably one managed by a university, but also with attention being paid toward security and transparency as well as providing added value. Similarly, due to scientific assessment related to the positive externalities of the tea ecological pest management (TEPM) system that could affect socio-economic development and ecological benefits, Zheng et al. (2019) suggested that the government should adopt this threshold as a minimum subsidy to mitigate information asymmetry in two markets, namely, ecological management technology and trading between suppliers and buyers of tea products. Hence, though the original intention of the tripartite rural land entitlement system was to activate farmland management rights and improve the efficiency of land element allocation, Li et al. (2020) indicated that information asymmetry was prevalent in a market with imperfect competition.

Interestingly, compared with conventional hotels that provide a standardized service, individual offerings on an accommodation-sharing platform made consumers uncertain about service quality, which was mainly due to information asymmetry between the consumers and individual hosts (Fan et al. 2022). In addition, because software developers needed information for deciding the optimal time for software release with improved software reliability, it was not easy for them to decide when and how to release newly developed software to the market. Therefore, it was necessary to propose a method for overcoming the mean value randomness that caused asymmetry in the related data. On the other hand, outlining the role of water markets management in times of water scarcity and highlighting the drivers of water markets in southern Africa, such as water scarcity, trans-boundary nature of water resources, and their uneven distribution, as the concept was new in the region, it still had challenges that included general market inefficiencies, high transaction costs, market information asymmetries, imperfect competition, and weak or

absent robust institutional frameworks that could facilitate market development (Matchaya et al. 2019). More especially, though the sheer volume of data generated on the Internet had reached unprecedented numerical heights and had enabled new data-driven methodologies to study art and its markets, this type of data-driven research had also generated several unexpected methodological constraints for art markets researchers, particularly due to informational asymmetry (Miegroet et al. 2019).

Market Failure

Theoretically, market failure refers to inefficient resource distribution in a free market and is associated with public goods, time-inconsistent preference, information asymmetry, non-competitive markets, principal–agent problems, or externalities. In addition, market failure is also applied in many studies or practical operations. For example, Bachmann (2019) argued that climate change was the greatest example of market failure the world had ever seen. This type of market failure, termed an "externality" in economics, led to an inefficient use of society's resources, or so-called "suboptimal allocation of resources." As a result, the welfare of society was smaller than what could be achieved. Environmental externalities aroused not only from climate change but also from changes of air, water, and soil quality, inducing impacts on human health, the built environment, and ecosystems. Similarly, due to significant failures in key markets relevant to tackling carbon emissions and to the absence of crucial markets, the governments must play an active role in formulating and implementing effective environmental policies, regulations, and design. Both major market failures and market absence, leading to suggestions on policy measures that governments should take to overcome these challenges, enabling markets to give better signals in directing resource allocation and guiding the low-carbon transition (Stern 2022). Even if the Circular Economy (CE) was expected to tackle the unprecedented climate catastrophe, there were market failures of double externality related to such environmental innovations (EI). Double externality market failures and circular risk were termed as three ("environmental–knowledge–financial) reinforcing market failures: i.e., a triple helix of market failures (Austin and Rahmanb 2022).

On the other hand, Boffa and Iozzi (2021) explored the types of government intervention in the transport sector, which were classified along a spectrum ranging from direct government intervention, where the government, possibly by owning the company, directly set the strategic variables of the transportation service provider, or from the infrastructure operators to indirect interventions that modified suppliers' or consumers' incentives, possibly through taxes and found the interplay of these interventions as they were applied to correct market power distortions, and to correct environmental and congestion externalities. It could be seen that public intervention in the transport sector was motivated by market failures (climate, air pollution, congestion, imperfect competition, etc.) although there was no guarantee that governments implemented the optimal policy response as there could also be political failures (Borger and Proost 2021). Tang et al. (2021) examined several features of an imperfect market, such as transaction costs and market power, and strategic behaviors of firms that might adversely affect the performance and efficiency of tradable discharge permit systems, and revealed that the discharge permit policy exhibited a distinct emission reduction effect due to market failure and strategic behaviors of firms. Simultaneously, when the term "social license to operate" had increasingly been used to describe the social and environmental standards for firms to meet, it was suggested that social license concerns stem from government and market failures (Dumbrell et al. 2020).

Interestingly, while an innovation's attributes and performance were paramount, many failed because of external factors that favored an alternative, especially when negative externalities associated with an incumbent transportation technology might lead to market failure (Briggs et al. 2015). In other words, justifications for innovation policy were generally related to notions of market failure that were applicable in all nations in all conditions (Dodgsona and Metcalfed 2011). Furthermore, because consumers innovated usually for non-commercial motives, they generally lacked incentives to diffuse even if consumer innovations were valuable to many other people, which confirmed this market failure (De Jong et al. 2028). Hence, it had been argued that the diffusion of user-developed innovations was negatively affected by a new type of market failure: value that others might gain from a user-developed product could often be an externality to consumer-developers. As a result, consumer innovators might not invest in supporting

diffusion to the extent that would be socially optimal. Accordingly, failure is affecting the diffusion of user innovations developed by consumers for their own use (De Jong et al. 2015).

More specifically, Rosenstiel et al. (2015) examined the market share of natural gas vehicles (NGVs) in Germany lagging behind expectations and behind market developments in other countries, and concluded that coordination failure in complementary markets, an artificially created monopoly of service stations at motorways, imperfect information, bounded consumer rationality, and principal–agent problems, were the most prominent market failures inhibiting the development of a functioning market for NGVs. Chen (2016) stated that despite a high vacancy rate of residential homes, housing prices remained sticky, which caused higher searching and bargaining costs. With an inefficient outcome, deadweight loss and market failure arose, which demonstrated how the sticky price resulted in market failure and showed that a high degree of market failure was associated with a high ratio of persistent components in the gap between price and equilibrium. Especially, Harvey and Hubbard (2013) highlighted that animal welfare was often cited as a classic public good, which implied market failure and, thus, that government intervention was required.

Cirone and Urpelainen (2013) recognized that a unified government could easily strike the bargains required to secure political support for new technology programs and found that as government fractionalization increased in a country, the sensitivity of public energy R&D to wasteful energy use, which presented economic and environmental difficulties to the society, declined. The analysis revealed a new reason for ineffective technology policies and contributed to political market failure. As such, Fidel Perez-Sebastian (2015) demonstrated that the coexistence of intellectual property rights and R&D subsidies could be explained as a response to the presence of both market and government failures, and Choi and Lee (2017) proposed that the government's R&D subsidy stimulated rather than crowded out private R&D activities of small biotechnology venture firms, providing additional empirical evidence that government R&D subsidies could successfully address market failure in private R&D investment. Accordingly, exploring whether and why people sometimes rejected environmental policies that improved individual and collective outcomes, Cherry et al. (2017) indicated that people often opposed policies that improved their material outcomes; it was found that such opposition was significantly explained by cultural worldviews, which explained market failure. Moore (2013) studied the presence of software defects despite the maturity of the software industry and pointed out that this was the result of market failure stemming from two factors: information asymmetry, which prevented the establishment of software quality prior to purchase, and the legal provisions available under private law, which were unable in their current form to adequately address software liability issues.

However, Balmaceda (2021) found that a competitive labor market failed to provide first-best incentives to invest in general human capital and this had distributive consequences: college students and firms underinvest in human capital, causing the distributive consequences of this labor market failure. Likewise, though many modern progressives attributed the market's failings to conspiracies by powerful corporate actors to exploit workers and consumers, Frank (2016) claimed that many of the same failures were instead often rooted in competition among individuals for relative advantage. It was no wonder that analyzing the conceptual relationship between the market failure rationale and the systemic failure rationale as justifications for policy intervention within an innovation systems (IS) analytical framework. Bleda and Río (2013) implicitly presented the systemic failure framework as a more general approach than the market failure perspective. Therefore, a number of IS policy contributions explicitly rejected the market failure approach and considered it a flawed argument for government intervention. As such, Jacobsson et al. (2017) also showed that to limit global warming to 1.5–2 °C and eliminate emissions of CO_2 equivalents over the next decades, the EU Commission's focus on market failures, static efficiency and technology neutrality did not cover all possible obstacles and led it to neglect the centrality of dynamic efficiency and the structural build-up of innovation systems around new technologies.

Government Interventions

In theory, government interventions were regulatory actions taken by the government that seek to change the decisions made by individuals, groups, and organizations about social and economic matters. Government was any action carried out by the government that affected the market with the objective of

changing the free market equilibrium or outcome. Market failures could be corrected through government interventions, which might result in government failure due to the inefficient and wasteful allocation of resources.

In practice, the studies associated with government interventions focused on three categories as follows: global financial crisis, climate change, and COVID-19.

First, the subprime-related 2007/2008 global financial crisis represented a major economic challenge that resulted in market failure. Therefore, the role of governments as lenders of last resort needed discussing (Breitenfellner and Wagner, 2010). Using bank bailout and funding injection actions to measure government interventions, the results showed that funding injections and bailout actions could both improve equity liquidity and increase net buying pressure (Chiu and Tsa 2017). Though intervention had taken different forms in different countries and periods of time, to address the problem of resolving banking crises from the government perspective, the fact taken into account was that preventing banking crises was crucial for the government (García-Palacios et al. 2014). Hence, many governments had used a variety of intervention policies to recover their financial systems. On average, bank performance in terms of solvency, credit risk, and profitability improved after government intervention (Ding et al. 2013). While in advanced countries interventions in the banking sector were mostly related to a lack of liquidity and significant asymmetric information regarding counterparty risk, in many less advanced countries they had a precautionary motive (Hryckiewicz 2021).

Second, with the aggravation of the global environmental crisis, consumers were keen to use green products and enterprises were more committed to technology investment and innovation to meet consumers' green preferences. The technology investment decisions and cooperation strategies between the manufacturer and the retailer as well as the impacts of government regulations on supply chain members' decisions were discussed further. Governmental interventions considered three scenarios: decentralization, government intervention, and cost sharing and government intervention (Ma et al. 2021). Taking carbon trading in China as an example, how could China's carbon trading mechanism achieve the expected emission reduction when the market mechanism had not been fully established? This policy effect was not achieved through the market mechanism, but government intervention played a significant role in reducing carbon emissions (Lin and Huang 2022). Likewise, studying the moderating effect of local government intervention on transforming feed-in tariffs and knowledge stocks into renewable energy technology innovation, the results showed that local government intervention factors, such as policy count in renewables and R&D expenditure, were significant drivers for technology innovation (Zhao et al. 2021). Similarly, examining whether government intervention could act as an effective mechanism to foster public–private partnerships among construction companies and thereby promote ecological modernization through the adoption of green supply chain management, proved that enforcing and incentivizing aspects of governmental intervention, i.e., environmental regulations and governmental support, was effective in developing a regulatory framework for stakeholders (Xie et al. 2022). Especially when supply chain players in emissions-intensive industries were not likely to be motivated to make appropriate green improvements because significant investment was required for innovation and process improvement, the optimal green improvement degree was influenced by green technology investment, government intervention, and additional demand from customer green preferences (Zhang and Yousaf 2020).

Third, the COVID-19 pandemic came as a rare, unprecedented event and governments around the globe scrambled with emergency actions including social distancing measures, public awareness programs, testing and quarantining policies, and income support packages (Ashraf 2020). Therefore, exploring the impact of government intervention to contain the spread of COVID-19 in emerging countries on the performance of their leading stock indices, Aharon and Siev (2021) found that government restrictions were associated with negative market returns, possibly due to the anticipated adverse effect to the economy. Likewise, Zaremba et al. (2021) demonstrated that government interventions substantially reduced local sovereign bond volatility. The effect was mainly driven by economic support policies; the containment and closure regulations and health system interventions played no major role. Moreover, because COVID-19-related government interventions had significantly affected tourism, Wang et al. (2021) proposed significant insights for protecting and recovering the travel and leisure stock market by considering when

and which government interventions should be implemented. Similarly, Ten et al. (2021) also indicated that the COVID-19 pandemic could result in large government interventions in the banking industry. Interventions-especially longer and larger ones-had no significant impact on prices but they increased costs, mostly due to higher loan impairment charges lowering markups. Unexpectedly, COVID-19 and these government interventions affected exchange rate volatility (Feng et al. 2021). In other words, while intervention policies such as social distancing rules, lockdowns, and curfews might save lives during a pandemic, they imposed substantial direct and indirect costs on societies. As such, Eryarsoy et al. (2022) suggested earlier mitigation strategies that typically started before the saturation of the healthcare system when disease severity was high.

In addition, government interventions were more widely used in various situations. For instance, when systematic risk was high, or the market crashed, most risk-averse investors chose to exit the market; however, policy risk was low and there was a high probability, the market would recover subsequent to government intervention (Liu et al. 2016). Kleymenova et al. (2016) demonstrated that government interventions affected the global activities of individual banks along three dimensions: depth, breadth, and persistence. Wang (2017) proposed that government was one of the determinants for innovation capacity although its role and degree of involvement in innovation was debatable. In other words, government interventions could be vital in supporting R&D and innovation as the market alone could not provide adequate incentives for knowledge production though degrees of government intervention varied in different economies and ranged from directive intervention by actively advising industrial policy and investing in selected areas to facilitative intervention by a creating positive environment and providing public goods for industry.

However, government intervention brought some negative impacts inevitably. For example, examining information asymmetry and agency conflicts between managers and outside investors prevents firms from making optimal investment decisions. It was found that government intervention, as another form of friction, distorted firms' investment behavior and led to investment inefficiency (Chen et al. 2021). Therefore, though government intervention was needed to transform scientific and technological knowledge into innovative nascent entrepreneurship, drawing on knowledge spillover played an important role on the moderating effect of government intervention on the relation between them (Yoon et al. 2018). Fu (2020) even claimed that the corruption was the by-product of government intervention in financing and that the corruption due to government intervention constrained micro-financial development. In other words, the corruption was the crux of the government-intervention dilemma. Similarly, investigating this issue by investigating the impact of government intervention on firm financing and financial corruption in China, Feng et al. (2019) also confirmed that government intervention promoted financial access and encouraged corruption. Even further, Chang et al. (2021) suggested that a greater degree of government intervention could increase the risk that a firm would become a "zombie" firm.

Based on the above studies, it was found that government interventions might bring positive and negative effects, which implied that the controversy of whether government intervention should be used. In other words, the timing of government interventions should be considered more carefully in order to minimize negative impacts, which offers an important reference for further studies.

Government Failure

Government failure built on the work of the public choice school concerning the behavior of governments under the assumption that all relevant agents pursue their self-interest in the context of public economics, which was an economic inefficiency caused by a government intervention, if the inefficiency would not exist in a true free market (Grand,1991). It also implied that the government could not fulfil its key obligations related to formulating rules. Therefore, the government should establish rules as frameworks within which market actors should act in order to represent the interests of society. Noticeably, while market failures had been discussed intensively in the economic literature, government failures were often neglected by scholars (Dolfsma 2017). For example, Wallis and Dollery (2021) argued that both the government failure paradigm with its "top-down" emphasis and the social capital theory with its stress on "bottom-up" approaches, provided analytical frameworks that could be used to comprehend the symptoms

of state incapacity. Even further, Keech and Munger (2015) demonstrated that setting aside natural disasters, most of the great catastrophes of human history had been government failures of one sort or another and government failure in the contemporary context meant failing to resolve a classic market failure.

Hence, it was not difficult to find examples related to government failure. Hyman (2008) pointed out that government failure should occupy center-stage in understanding how health insurance came to look the way it did. Andersson (1991) suggested that government failure was a major cause of environmental mismanagement. Makin (2009) even stated that financial collapse was rooted in a series of government actions that had distorted and obscured the true nature of home ownership because the housing price erupted in 2006 led to market failure and pushed the global economy into the worst contraction. Ofria and Mucciardi (2021) explored regional variation in the relationship between non-performing loans (NPLs) and the proxies of "government failure," found that the impact of institutional corruption on NPLs, and reported that the higher the corruption the higher the level of NPLs. Manuela Jr. and De Vera (2015) also argued that self-inflicted wounds like the failure of the government to comply with international aviation safety standards might derail the country from achieving its goals while the Philippines aspired to be one of the top tourist destinations in Southeast Asia. Cullis et al. (1993) analyzed the introduction of the Poll Tax in the U.K. in April 1990 within the context of government failure in tax reform and found the reform was consistent with a rent seeking strategy on the part of central government. Yan et al. (2021) took the "five European big countries" in the European debt crisis as an example to analyze the event from the perspective of market failure and government failure, and concluded that the European debt crisis was the common product of market failure and government failure. Similarly, Dumbrell (2020) examined the term "social license to operate" and supposed that social license concerns stemmed from government and market failures, namely: (1) negative externalities, (2) undersupply of/threats to public goods, and (3) use of socially valuable assets to generate private profits.

Moreover, dealing with the evolution of approaches to the problem of "government failures," the interdisciplinary approach to "government failures" took into account the influence of legal rules and institutions on the nature of allocation of public resources (Radygin and Entov 2012). Yip and Eggleston (2004) examined the role of provider payment policy as an instrument for addressing government and market failures and controlling costs in the health sector, and proposed that payment reform could be an effective policy instrument for correcting market failures and adverse side effects of government health sector interventions. On the other hand, Eyzaguirre et al. (2014) argued that government failure fell short in adequately addressing this topic, thereby exposing students to the fallacy that government was the solution to market failure and drawing dangerously close to the line between positive and normative analysis. Ehtiman and Babasoylu (2020) even recognized that government failure was, in brief, the unfavorable outcomes of the regulations and interventions formed by the state to the economy. When the government intervened in the economy to cure an economic issue, the result only created more problems.

Based on the above studies, it could be seen that economic issues were dealt with through the political process. Though economists had focused on how the market worked and what ideal public policy could do to improve economic efficiency, the actual operation of the public sector had been virtually ignored. However, this traditional neglect had apparently become less and less satisfactory in dealing with economics today (Gwartney and Stroup 2014). Therefore, both concepts were problematic in a world of entangled political economies in which market and government activities were interconnected. In other words, it was time to abandon both "market failure" and "government failure," and instead focus on problems of institutional mismatch (Furton and Martin 2019).

PROPOSED MODEL AND RESEARCH HYPHOTHSES

Based on the above literature review, the research model is constructed as illustrated in Figure 1. Apparently, information asymmetry is combined with or explained by adverse selection and moral hazard, and the three actually have a causal relationship and influence each other, which may cause market failure. Therefore, it is necessary to collect and analyze a range of variables associated with adverse selection and

moral hazard, construct research hypotheses, and test whether the empirical results can support the coexistence of the information asymmetry and market failure.

Under the premise of empirical results supporting the coexistence of the information asymmetry and market failure, the article continued to construct the research hypotheses related to government interventions and tested if government interventions could improve market failure or information asymmetry, or conversely, lead to government failure.

FIGURE 1
PROPOSED MODEL OF MARKET FAILURE AND GOVERNMENT INTERVENTIONS
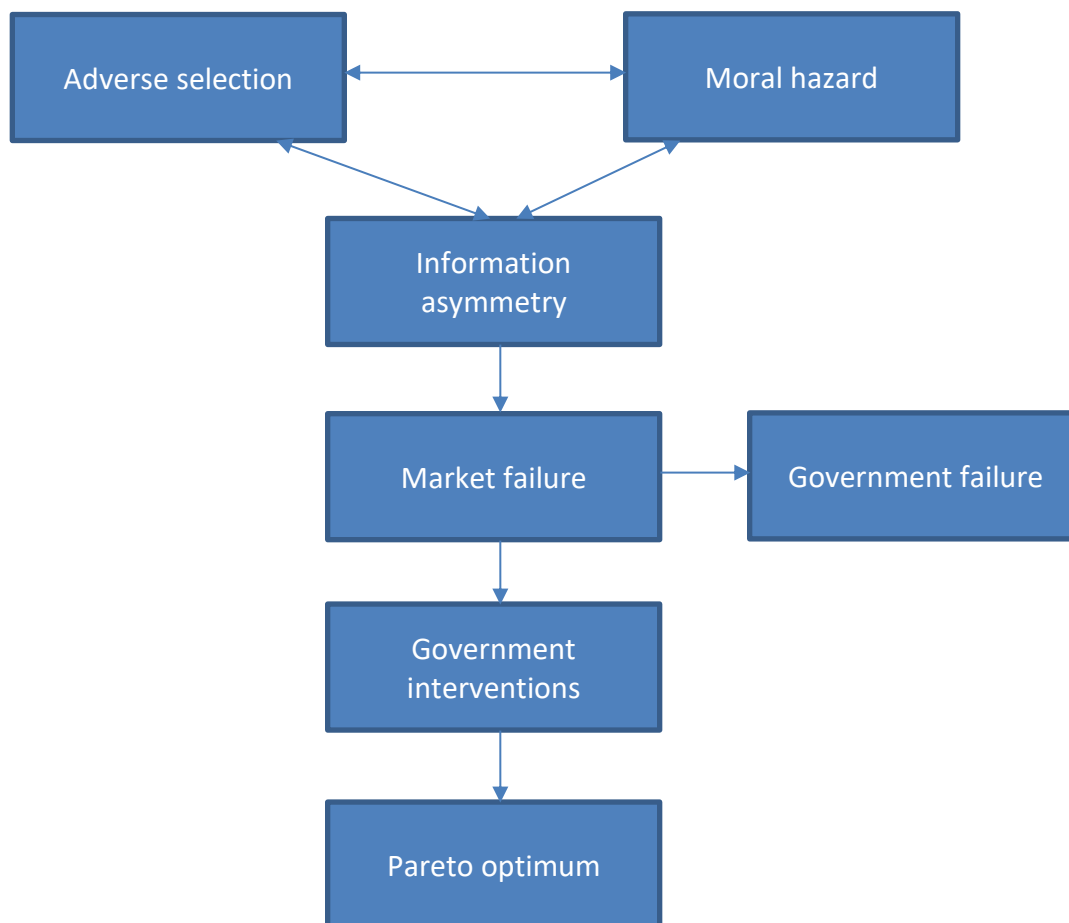
To achieve the goal, the article focused on two aspects of market failure and government intervention, and designed the research hypotheses based on the relevant variables as follows.

Hypotheses of Adverse Selection in Existence

H1: High revolving interest rates come with high cards in force.

H2: High revolving interest rates come with high revolving balance.

Hypotheses of Moral Hazard in Existence

H3: High overdue ratios come with adverse selection.

H4: *High monthly write-off amounts come with adverse selection.*

H5: *Pre-tax earnings of issuing card banks come with adverse selection.*

H6: *High criminal cases and suicide cases come with adverse selection.*

H7: *Low domestic consumption contributions to GDP come with adverse selection.*

Hypotheses of the Effectiveness from Government Intervention

H8: *Cards in force decline after government interventions.*

H9: *Revolving balances decline after government interventions.*

H10: *Overdue ratios decline after government interventions.*

H11: *Monthly write-off amounts decline after government interventions.*

H12: *Pre-tax earnings of issuing card banks increase after government interventions.*

H13: *Criminal cases and suicide cases decline after government interventions.*

H14: *Domestic consumption contributions to GDP increase after government interventions.*

DISCUSSIONS AND RESULTS

Market Failure: Adverse Selection

Due to the characteristics of the credit card market, the study applied information asymmetry combined with adverse selection and moral hazard in order to test and confirm if the research hypotheses were supported and that market failure existed. Combined, Table 1 and Figure 2 represent the fact that the maximum revolving interest rates of domestic primary issuing card banks had always remained at a higher level even if the weighted average lending rate kept declining since 1991. The difference between them was much larger during the card debt crisis in Taiwan, which formed the foundation for testing the research hypotheses of adverse selection and moral hazard.

TABLE 1
MAXIMUM REVOLVING INTEREST RATE BEFORE AND AFTER 2015

Issuing cards banks	Maximum revolving interest rate before 2015	Maximum revolving interest rate after 2015
Taipei Fu bon Bank	20.00%	14.70%
Cathy Pacific Commercial Bank	19.70%	15.00%
Citi (Taiwan) Commercial Bank	20.00%	15.00%
HSBC	19.929%	15.00%
Shin Kong Commercial Bank	19.71%	15.00%
Yang Xin Bank	19.71%	15.00%
Federal Commercial Bank	19.99%	15.00%

|		
Far East International Commercial Bank	19.97%	15.00%
Yuan Ta Commercial Bank	19.71%	15.00%
Yong Feng Commercial Bank	19.97%	15.00%
E. Sun Commercial Bank	19.71%	15.00%
DBS Bank	19.70%	15.00%
Tai Shin International Commercial Bank	19.99%	15.00%
Aetna Bank	19.97%	15.00%
China Trust and Commercial Bank	20.00%	15.00%

FIGURE 2
WEIGHTED REVOLVING LENDING INTEREST RATE
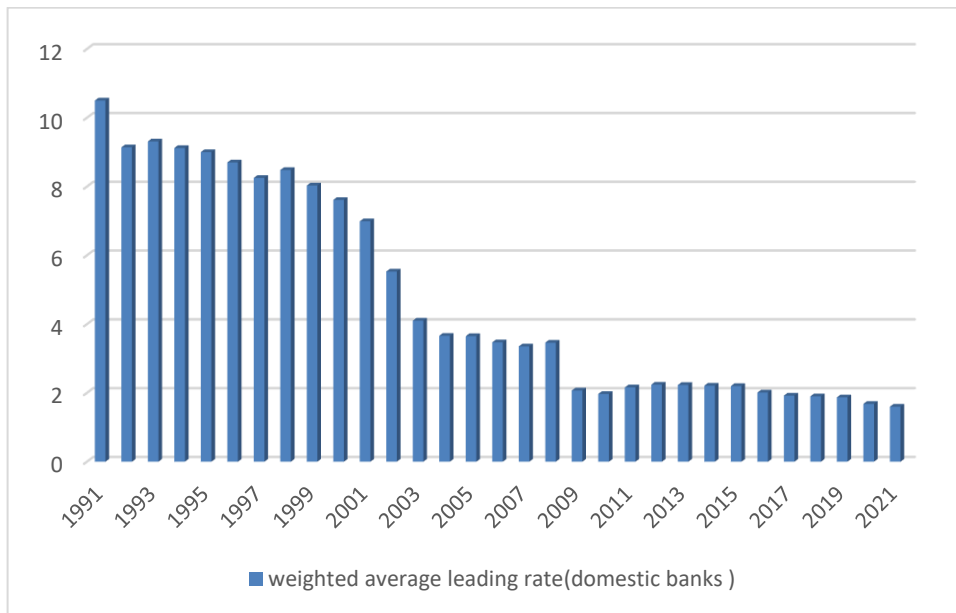
H1: High Revolving Interest Rates Come With High Cards in Force

Based on Figure 3, cards in force reached a peak during the card debt crisis in Taiwan in 2005 even if the weighted average lending rate was much lower than the revolving interest rates (see Figure 2). Apparently, the result was against the demand law on the basis of the market mechanism. In other words, people were still encouraged to apply for credit cards even at a higher price. Because the card debt crisis was combined with adverse selection, H1 was supported.
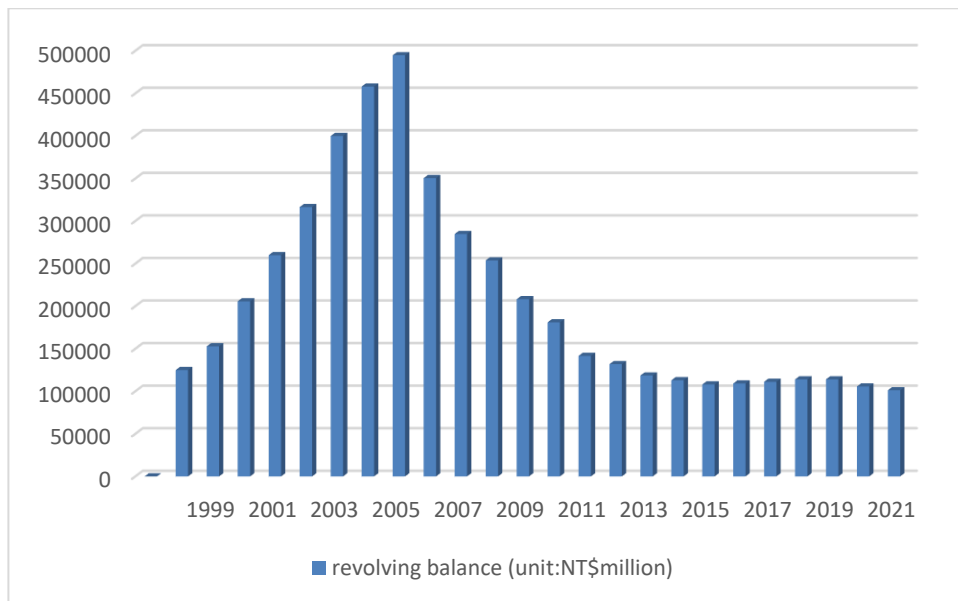
FIGURE 3
CARDS IN FORCE

cards in force (unit:thousand)
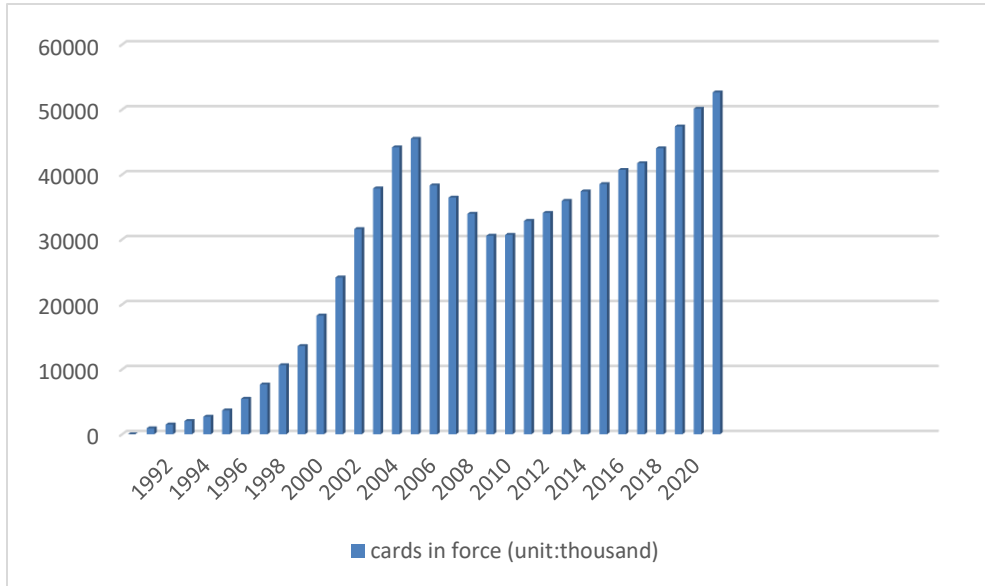
H2: High Revolving Interest Rates Come With High Revolving Balance

Following the result of H1, high revolving balance was matched with higher revolving interest rates (see Figure 4). In other words, people were encouraged to apply a revolving balance for transaction or credit behaviors even though revolving interest rates were higher than the weighted average lending rate. Adverse selection was proven and H2 was also supported.

FIGURE 4
REVOLVING BALANCE

revolving balance (unit:NT$million)

Market Failure: Moral Hazard

H3: High Overdue Ratios Come With Adverse Selection

Following adverse selection, moral hazard brought the negative impact on the issuing card banks, society, and even the national economy. Figure 5 shows the result of adverse selection as overdue ratios of credit cards followed cards in force and revolving balance, reaching a peak in 2006. When high overdue ratios were combined with high revolving interest rates, moral hazard was proven and H3 was supported.

FIGURE 5
OVERDUE RATIOS
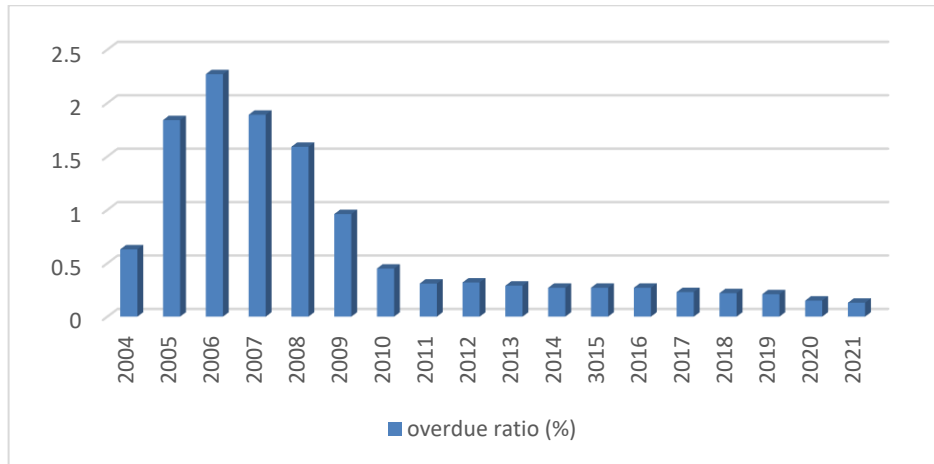
H4: High Monthly Write-Off Amount Comes With Adverse Selection

Likewise, monthly write-off amount was considered the consequence of overdue ratios and issuing card banks could not but accept and afford the actual loss caused by adverse selection. Moral hazard was proven when high monthly write-off amount was combined with high revolving interest rates (see Figure 6) and H4 was supported.
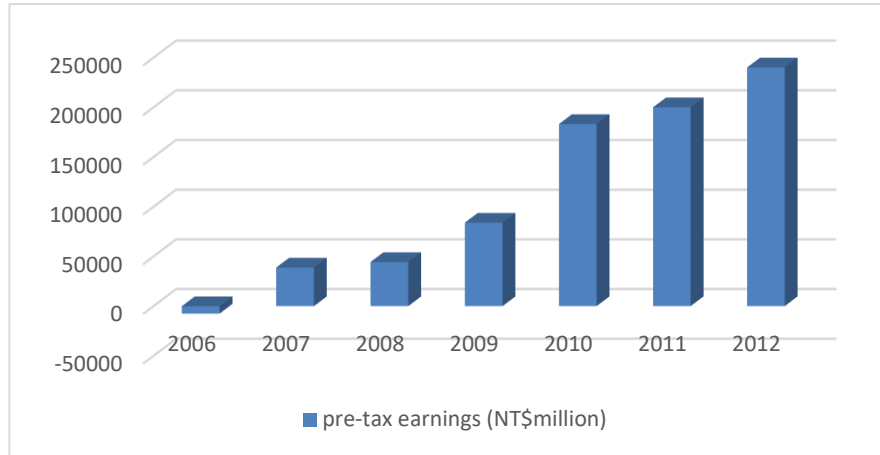
FIGURE 6
MONTHLY WRITE-OFF AMOUNT
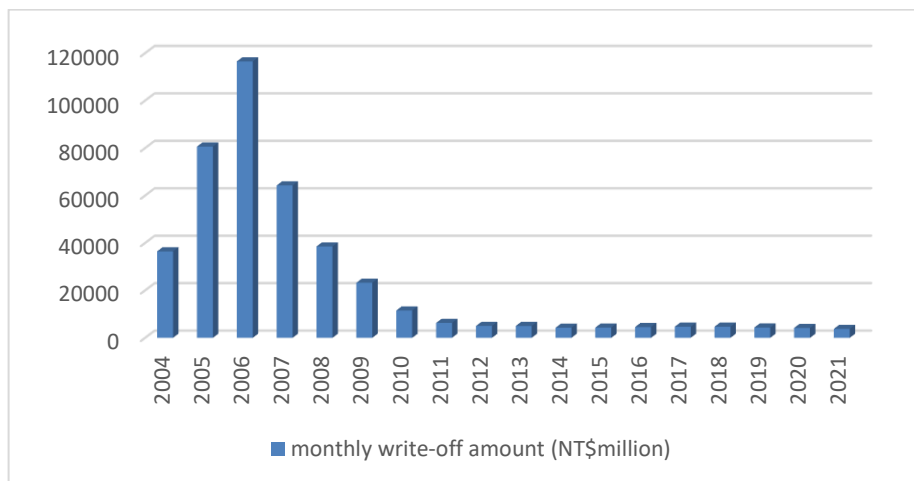
H5: Pre-Tax Losses of Issuing Card Banks Come With Adverse Selection

Before testing the hypothesis, it was emphasized that banks in Taiwan were licensed industries. In other words, the banking market industry was not completely competitive. Furthermore, it also implied that the bank industries were protected or needed regulations under the imperfect market. Therefore, there was little probability for banks coming with pre-tax losses. However, due to adverse selection and the card debt crisis, rare pre-tax losses occurred in 2006 (see Figure 7) and issuing card banks became the direct victims. Therefore, H5 was supported.
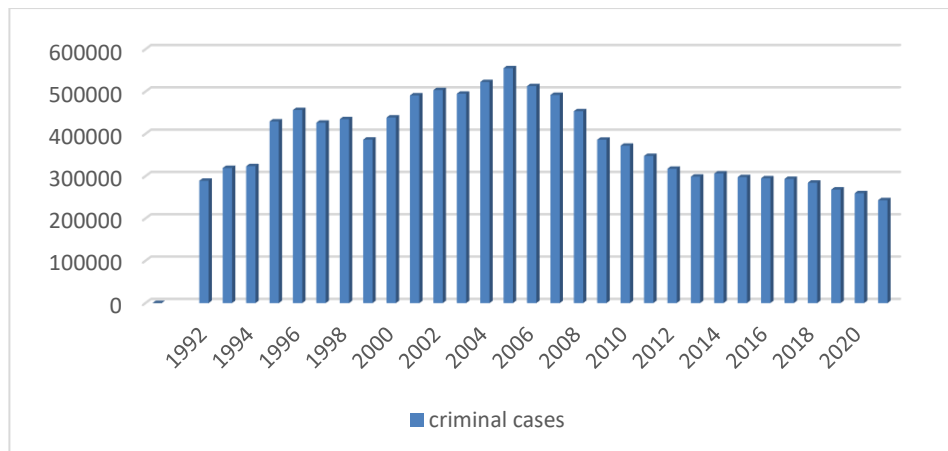
FIGURE 7
PRE-TAX EARNINGS

H6: High Criminal Cases and Suicide Cases Come With Adverse Selection

As mentioned earlier, the card debt crisis not only affected the banking industry but also impacted the society and economy. From Figures 8 and 9, it can be seen that criminal cases and suicide cases reached peaks separately in 2005 and 2006, respectively. It needed to be emphasized that such a result was not an accident, but an inevitable consequence of moral hazard resulting from adverse selection. Hence, H6 was supported.

FIGURE 8
CRIMINAL CASES

FIGURE 9
SUICIDE CASES
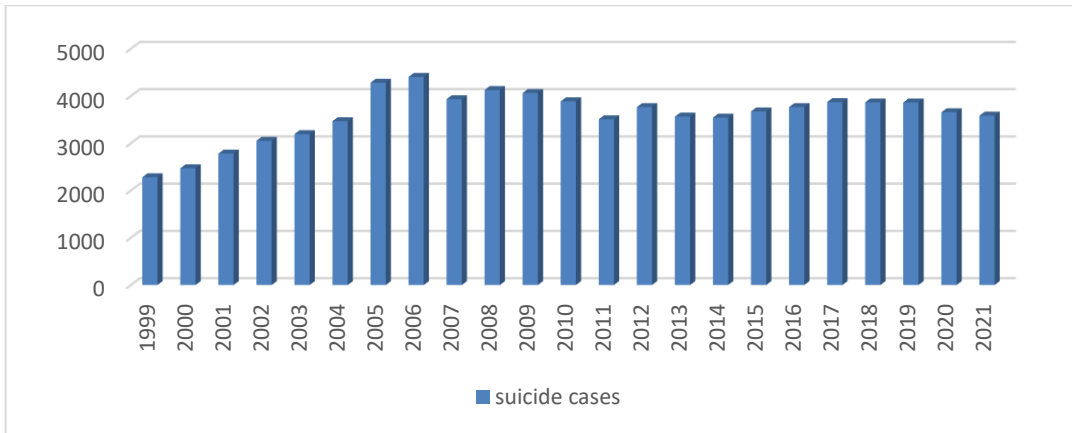
H7: Low Domestic Consumption Contributions to GDP Come With Adverse Selection

Credit cards are the consumer's financial instruments, which could stimulate private consumption and make domestic consumption contributions to GDP. However, due to the card debt crisis, not only had domestic consumption contributions to GDP not risen, but it had fallen since 2004 (see Figure 10). In addition to financial and societal dimensions, the result implied that the card debt crisis also impacted private consumption and further damaged GDP, which proved moral hazard existed during the card debt crisis. Therefore, H7 was supported.

FIGURE 10
GDP CONTRIBUTIONS: DOMESTIC DEMAND
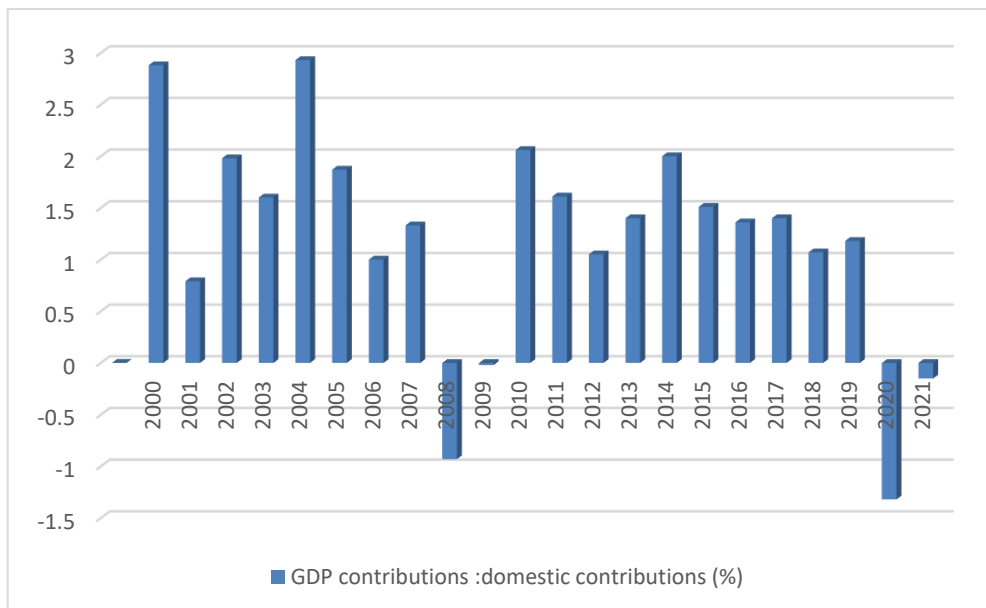
Government Interventions in Adverse Selection

According to the aforementioned tests, almost all indicators related to the card debt crisis in Taiwan reached the highest point in 2005 or 2006, which confirmed that the card debt crisis was rooted in market failure under information asymmetry. It not only affected finance but also affected social stability and the

national economy. Therefore, under the pressure of public opinion, government interventions became a necessary option to deal with the card debt crisis. In terms of the time sequence, the main measures of government interventions in response to the increasingly serious card debt crisis included the Debt Negotiation Mechanism in January 2006, Guidelines for Financial Institutions in Setting Tiered Interest Rates for Credit Cards and Cash in March 2006, and the Consumer Debt Settlement Regulations in June 2007. Comparing the Debt Negotiation Mechanism with Consumer Debt Settlement Regulations, it was found that the latter was much higher than the former in terms of the intensity of government interventions.

Why was there such a difference in the policy intensity? This article argued that this was due to an ongoing debate over whether government interventions could improve information asymmetry and market failure. Perhaps it was for this reason that even though the card debt crisis had reached its peak in 2005, the countermeasures were still hesitant and unable to be launched smoothly. Even if countermeasures had been proposed, they were initially passive. The Debt Negotiation Mechanism in January 2006 was the best example. In addition to showing that the card debt problem was too serious to be resolved immediately, this result also revealed doubts about whether the adoption of government interventions was too slow. The following hypotheses focused on whether government interventions improved market failure, made the market develop toward the Pareto optimum, and avoided the possibility of government failure caused by inappropriate government interventions.

H8: Cards in Force Decline After Government Interventions
Referring to Figure 3, cards in force reached the highest point in 2005 and declined gradually after 2006 as the associated countermeasures were employed to respond to the card debt crisis. The result revealed that government interventions could improve adverse selection in a timely and effective manner. Therefore, H8 was supported.

H9: Revolving Balances Decline After Government Interventions
From Figure 4, revolving balance also increased up to a peak in 2005 and then declined step-by-step after 2006. In other words, government interventions exactly contributed to improving adverse selection because the amount of revolving balance was inhibited significantly. Hence, H9 was supported.

Government Interventions in Moral Hazard
H10: Overdue Ratios Decline After Government Interventions
Following cards in force and revolving balance reaching the peak in 2005, overdue ratios reached the highest point the following year and started to decline until 2007 and after the countermeasures had taken effect (see Figure 5). Apparently, it was not easy to improve or reverse moral hazard following adverse selection and it needed more intensive countermeasures like the Consumer Debt Settlement Regulations. However, the result still showed overdue ratios had been improved and reversed eventually since 2007. Hence, H10 was supported.

H11: Monthly Write-Off Amounts Decline After Government Interventions
Similar to the tendency of overdue ratios, monthly write-off amounts reached the highest in 2006 and started to decline after 2007 when the Consumer Debt Settlement Regulations was passed by legislation (see Figure 6). Although the policy effect lagged behind the act, the final result presented that moral hazard caused by adverse selection was improved and reversed. Therefore, H11 was supported.

H12: Pre-Tax Earnings of Issuing Card Banks Increase After Government Interventions
Based on Figure 7, rare pre-tax losses occurred in Taiwan's banking industry in 2006. It is needed to emphasize that banks in Taiwan were licensed industries that were not only regulated by the competent authority, but protected by the imperfect market. Therefore, it is not easy to find the pre-tax losses in Taiwan's banking industry. However, the tendency reversed immediately after government interventions were employed. The result revealed that the banking industry improved moral hazard itself in a timely and effective manner even if they had been victims of the card debt crisis. Again, H12 was supported.

H13: Criminal Cases and Suicide Cases Decline After Government Interventions

As mentioned earlier, criminal cases and suicide cases reached the highest numbers separately in 2005 and 2006, respectively; this presented a moral hazard resulting from adverse selection and was also the price paid by the society. Referring to Figures 8 and 9, criminal cases and suicide cases were declined gradually, which confirmed that H13 was supported.

H14: Domestic Consumption Contributions to GDP Increase After Government Interventions

Due to the card debt crisis caused by adverse selection, moral hazard referred to declining domestic consumption contributions to GDP. Even worse, the tendency of domestic consumption contributions to GDP did not reverse until 2010 (see Figure 10). The result was different from those of other research hypotheses. Did it mean that government interventions failed to improve the market failure? The article supposed that it was better to say that the intensity of government interventions is inefficient rather than government interventions are ineffective. After all, the impact of card debt crisis on the economy was so deep and wide. As a result, domestic consumption contributions to GDP were reversed eventually after government interventions. Hence, H14 was supported.

CONCLUSIONS

Since 1997, financial crises have affected Asian countries. Unexpectedly, South Korea, Hong Kong, and Taiwan, which were also the four "Asian Tigers," also suffered the impact of the card debt crisis again in 2002, 2003, and 2005, respectively. Examining the timing of the credit card crisis, Taiwan not only did not learn from the experience of other countries to avoid the crisis but, in the case of market failure caused by asymmetric information, Taiwan was hesitant to take government interventions and fell into a dispute on choosing liberalism or protectionism; hence, the result was serious consequences of the card debt crisis spreading from the financial side to the social and economic sides.

In other words, in the face of the financial crisis caused by card debt, it was a pity that Taiwan not only failed to avoid it but was even impacted further than other countries. The supported research hypotheses associated with adverse selection and moral hazard (H1–H7) confirmed that the card debt crisis was the inevitable result of information asymmetry, leading to market failure.

Accordingly, in order to improve the market failure, re-operate the market mechanism, and make the market move toward Pareto optimum, government interventions had become a necessary option to deal with the credit card crisis.

Similarly, the results of this article showed that all the research hypotheses related to information asymmetry or market failure after government interventions (H8–H14) were supported, which proved that government interventions made significant contributions to solving the card debt crisis. Even the results for H14 suggested that the intensity of government interventions was inefficient but not ineffective to respond to moral hazard.

Therefore, the conclusion of this article was that under market failure, if policymakers were still subject to the price mechanism or liberalism of classical economics, then not only did it not help solve the card debt crisis but it might have led to more serious government failure due to inaction. Its policy implication revealed that policymakers needed to assess the situation, identify the causes of problems, and respond in time. Although the recurrence of crises cannot be avoided, at least the negative impacts can be minimized by allowing government interventions to improve market failure but not lead to government failure.

REFERENCES

Agusman, A., Cullen, G., Gasbarro, D., & Zumwalt, J.K. (2014). Government intervention, bank ownership and risk-taking during the Indonesian financial crisis. *Pacific-Basin Finance Journal*, *30*, 114–131. DOI:10.1016/j.pacfin.2014.07.003

Aharon, D.Y., & Siev, S. (2021). COVID-19, government interventions and emerging capital markets performance. *Research in International Business and Finance*, *58*. https://doi.org/10.1016/j.ribaf.2021.101492

Andersson, T. (1991). Government failure- the cause of global environmental mismanagement. *Ecological Economics*, *4*(3), 215–236. https://doi.org/10.1016/0921-8009(91)90052-G

Arora, R. (2017). Government Intervention and Financial Sector Development. In *Development Finance*. DOI:10.1057/978-1-137-58032-0_3

Ashraf, B.N. (2020). Economic impact of government interventions during the COVID-19 pandemic: International evidence from financial markets. *Journal of Behavioral and Experimental Finance*. DOI:10.1016/ j.jbef.2020.100371

Austin, A., & Rahmanb, I.U. (2022). A triple helix of market failures: Financing the 3Rs of the circular economy in European SMEs. *Journal of Cleaner Production*, *361*. https://doi.org/10.1016/j.jclepro.2022.132284

Bachmann, T.M. (2019). Optimal Pollution: The Welfare Economic Approach to Correct Related Market Failures. *Encyclopedia of Environmental Health (Second Edition)*, pp. 767–777. https://doi.org/10.1016/b978-0-12-409548-9.09382-9

Bae, J., Lee, J., & Kim, E. (2019). Does Fixed Asset Revaluation Build Trust between Management and Investors? *Sustainability*, *11*(13), 3700. https://doi.org/10.3390/su11133700

Balmaceda, F. (2021). A failure of the market for college education and on-the-job human capital. *Economics of Education Review*, *84*. https://doi.org/10.1016/j.econedurev.2021.102165

Bleda, M., & del Río, P. (2013). The market failure and the systemic failure rationales in technological innovation systems. *Research Policy*, *42*(5), 1039–1052. https://doi.org/10.1016/j.respol.2013.02.008

Boffa, F., & Iozzi, A. (2021). Market Failures in Transport: Direct and Indirect Public Intervention. *International Encyclopedia of Transportation*, pp. 596–600. https://doi.org/10.1016/B978-0-08-102671-7.10630-X

Borrero, J.D., & Mariscal, J. (2022). A Case Study of a Digital Data Platform for the Agricultural Sector: A Valuable Decision Support System for Small Farmers. *Agriculture*, *12*(6), 767. https://doi.org/10.3390/agriculture12060767

Breitenfellner, B., & Wagner, N. (2010). Government intervention in response to the subprime financial crisis: The good into the pot, the bad into the crop. *International Review of Financial Analysis*, *19*(4), 289–297. https://doi.org/10.1016/j.irfa.2010.05.001

Briggs, M., Webb, J., & Wilson, C. (2015). Automotive Modal Lock-in: The role of path dependence and large socio-economic regimes in market failure. *Economic Analysis and Policy*, *45*, 58–68. https://doi.org/10.1016/j.eap.2015.01.005

Chang, C.H. (2022). Information Asymmetry and Card Debt Crisis in Taiwan. *Bulletin of Applied Economics*, *9*(2), 123–145. https://doi.org/10.47260/bae/927

Chang, C.H., Chang, W.H., & Shih, Y.Y. (2022). Is Financial Institution Management Effective to Reduce Problems Related to Information Asymmetry in Taiwan? *Bulletin of Applied Economics*, *9*(2), 37–58. https://doi.org/10.47260/bae/923

Chang, Q., Zhou, Y., Liu, G., Wang, D., & Zhang, X. (2021). How does government intervention affect the formation of zombie firms? *Economic Modelling*, *94*, 768–779. https://doi.org/10.1016/j.econmod.2020.02.017

Chang, T.C., Lin, Y., Shi, K., & Meen, T.H. (2022). Decision Making of Software Release Time at Different Confidence Intervals with Ohba's Inflection S-Shape Model. *Symmetry*, *14*(3), 593. https://doi.org/10.3390/sym14030593

Chen, F.W., Feng, Y., & Wang, W. (2018). Impacts of Financial Inclusion on Non-Performing Loans of Commercial Banks: Evidence from China. *Sustainability*, *10*(9), 3084. https://doi.org/10.3390/su10093084

Chen, S., Sun, Z., Tang, S., & Wu, D. (2011). Government intervention and investment efficiency: Evidence from China. *Journal of Corporate Finance*, *17*(2), 259–271. https://doi.org/10.1016/j.jcorpfin.2010.08.004

Chen, W.D. (2016). Policy failure or success? Detecting market failure in China's housing market. *Economic Modelling*, *56*, 109–121. https://doi.org/10.1016/j.econmod.2016.03.024

Cherry, T.L., Kallbekken, S., & Kroll, S. (2017). Accepting market failure: Cultural worldviews and the opposition to corrective environmental policies. *Journal of Environmental Economics and Management*, *85*, 193–204. https://doi.org/10.1016/j.jeem.2017.05.004

Chiu, J., & Tsai, K. (2017). Government interventions and equity liquidity in the sub-prime crisis period: Evidence from the ETF market. *International Review of Economics & Finance*, *47*, 128–142. https://doi.org/10.1016/j.iref.2016.10.013

Choi, J., & Lee, J. (2017). Repairing the R&D market failure: Public R&D subsidy and the composition of private R&D. *Research Policy*, *46*(8), 1465–1478. https://doi.org/10.1016/j.respol.2017.06.009

Cirone, A.E., & Urpelainen, J. (2013). Political market failure? The effect of government unity on energy technology policy in industrialized democracies. *Technovation*, *33*(10–11), 333–344. https://doi.org/10.1016/j.technovation.2013.06.001

Cullis, J.G., Jones, P.R., & Morrissey, O. (1993). The charge of the tax brigade: A case study of government failure and tax reforms. *European Journal of Political Economy*, *9*(3), 497–425. https://doi.org/10.1016/0176-2680(93)90008

Davies, H. (2011). *The Financial Crisis: Who is to Blame?* OAI. ResearchGate.

De Borger, B., & Proost, S. (2021). Market Failures and Public Decision Making in the Transport Sector. *International Encyclopedia of Transportation*, pp. 2–6. https://doi.org/10.1016/B978-0-08-102671-7.10000-4

de Jong, J.P.J., Gillert, N.L., & Stock, R.M. (2018). First adoption of consumer innovations: Exploring market failure and alleviating factors. *Research Policy*, *47*(2), 487–497. https://doi.org/10.1016/j.respol.2018.01.004

de Jong, J.P.J., Hippel, E., Gault, F., Kuusisto, J., & Raasch, C. (2015). Market failure in the diffusion of consumer-developed innovations: Patterns in Finland. *Research Policy*, *44*(10), 1856–1865. https://doi.org/10.1016/j.respol.2015.06.015

de Soto, J.H., Sánchez-Bayón, A., & Bagus, P. (2021). Principles of Monetary & Financial Sustainability and Wellbeing in a Post-COVID-19 World: The Crisis and Its Management. *Sustainability*, *13*(9), 4655. https://doi.org/10.3390/su13094655

Deng, L., Jiang, P., Li, S., & Liao, M. (2017). Government intervention and firm investment. *Journal of Corporate Finance*, *63*. DOI:10.1016/j.jcorpfin.2017.07.002

Ding, C.G., Wu, C.H., & Chang, P.L. (2013). The influence of government intervention on the trajectory of bank performance during the global financial crisis: A comparative study among Asian economies. *Journal of Financial Stability*, *9*(4), 556–564. https://doi.org/10.1016/j.jfs.2012.11.002

Dodgsona, M., & Metcalfed, S. (2011). Systems thinking, market failure, and the development of innovation policy: The case of Australia. *Research Policy*, *40*(9), 1145–1156. https://doi.org/10.1016/j.respol.2011.05.015

Dolfsma, W. (2017). Government Failure. Society, Markets and Rules (excerpts). *ResearchGate*. DOI:10.17323/1726-3247-2017-3-54-69

Dumbrell, N.P., Adamson, D., & Wheeler, S.A. (2020). Is social license a response to government and market failures? Evidence from the literature. *Resources Policy*, *69*. https://doi.org/10.1016/j.resourpol.2020.101827

Ehtiman, E.N., & Babasoylu, N.Y. (2020). Political Approach to Government Failure. *ResearchGate*.

Elena, P. (2013). CRISIS AND ANTI-CRISIS: The Economic Crisis between Liberalization and Government Intervention. *ResearchGate*.

Eryarsoy, E., Shahmanzari, M., & Tanrisever, F. (2022). Models for government intervention during a pandemic. *European Journal of Operational Research*. https://doi.org/10.1016/j.ejor.2021.12.036

Eyzaguirre, H., Ferrarini, T.H., & O'Roark, J.B. (2014). Textbook confessions: Government failure. *Journal of Private Enterprise*, *29*(3), 159–175.

Fan, X., Cheng, T.C.E., & Li, G. (2022). Opaque or Transparent: Quality Disclosure Strategy for Accommodation-Sharing Platforms. *J. Theor. Appl. Electron. Commer. Res.*, *17*(2), 414–438. https://doi.org/10.3390/jtaer17020022

Feng, G.F., Yang, H.C., Gong, Q., & Chang, C.P. (2021). What is the exchange rate volatility response to COVID-19 and government interventions. *Economic Analysis and Policy*, *69*, 705–719. https://doi.org/10.1016/j.eap.2021.01.018

Feng, L., Fu, T., & Kutan, A.M. (2019). Can government intervention be both a curse and a blessing? Evidence from China's finance sector. *International Review of Financial Analysis*, *61*, 71–81. https://doi.org/10.1016/j.irfa.2018.10.010

Frank, R.H. (2016). Cash on the table: Why traditional theories of market failure fail. *Journal of Economic Behavior & Organization*, *126*(b), 130–136. https://doi.org/10.1016/j.jebo.2015.10.015

Fu, T. (2020). The dilemma of government intervention in a firm's financing: Evidence from China. *International Review of Financial Analysis*, *71*. https://doi.org/10.1016/j.irfa.2020.101525

Furton, G.L., & Martin, A. (2019). Beyond market failure and government failure. *Public Choice*, *178*(3). DOI:10.1007/s11127-018-0623-4

Gan, C. (2020). Editorial for the Special Issue on Commercial Banking. *J. Risk Financial Manag.*, *13*(6), 111. https://doi.org/10.3390/jrfm13060111

García-Palacios, J.H., Hasman, A., & Samartín, M. (2014). Banking crises and government intervention. *Journal of Financial Stability*, *15*, 32–42. https://doi.org/10.1016/j.jfs.2014.08.007

Gwartney, J.D., & Stroup, R. (2014). Macroeconomics (Third Edition) Private and Public Choice. *22-Public Choice: Gaining From Government And Government Failure*, pp. 455–475. https://doi.org/10.1016/B978-0-12-311071-8.50028-7

Harvey, D., & Hubbard, C. (2013). Reconsidering the political economy of farm animal welfare: An anatomy of market failure. *Food Policy*, *38*, 105–144. https://doi.org/10.1016/j.foodpol.2012.11.006

Hryckiewicz, A. (2013). Government interventions in the banking sector and the stability of the financial sector. *Ekonomista*.

Hryckiewicz, A. (2021). There is no smoke without a fire: The effect of government interventions in less advanced economies. *Economic Systems*, *45*(1). https://doi.org/10.1016/j.ecosys.2020.100776

Hu, Q., Peng, Y., Guo, C., Cai, D., & Su, P. (2019). Dynamic Incentive Mechanism Design for Recycling Construction and Demolition Waste under Dual Information Asymmetry. *Sustainability*, *11*(10), 2943. https://doi.org/10.3390/su11102943

Hyman, D.A. (2008). Health Insurance: Market Failure or Government Failure? *Electronic Journal*. DOI:10.2139/ssrn.1087830

Jacobsson, S., Bergek, A., & Sandén, B. (2017). Improving the European Commission's analytical base for designing instrument mixes in the energy sector: Market failures versus system weaknesses. *Energy Research & Social Science*, *33*, 11–20. https://doi.org/10.1016/j.erss.2017.09.009

Jardim, M.C. (2008). The 2008 Financial Crisis: Government Discourses and Strategies and Pension Funds in Brazil. *Dados*, *56*(4), 901–941.

Keech, W.R., & Munger, M.C. (2015). The anatomy of government failure. *Public Choice*, *164*(1–2), 1–42. https://doi.org/10.1007/s11127-015-0262-y

Kleymenova, A., Rose, A.K., & Wieladek, T. (2016). Does Government Intervention Affect Banking Globalization? *Journal of the Japanese and International Economies*, *40*, 43–58. https://doi.org/10.1016/j.jjie.2016.03.002

Kunjal, D. (2022). Evaluating the Liquidity Response of South African Exchange-Traded Funds to Country Risk Effects. *Economies*, *10*(6), 130. https://doi.org/10.3390/economies10060130

Le Grand, J. (1991). The Theory of Government Failure. *Journal of Political Science*, *21*(4). DOI:10.1017/S0007123400006244

Li, Y., Du, R., Li, L., Jiang, G., & Fan, Z. (2020). Influences of the Transaction Intention of Farmland Transfer under Information Asymmetry: An Empirical Study of 1100 Questionnaires from China. *Sustainability*, *12*(9), 3739. https://doi.org/10.3390/su12093739

Lin, B., & Huang, C. (2022). Analysis of emission reduction effects of carbon trading: Market mechanism or government intervention? *Sustainable Production and Consumption*, *33*, 28–37. https://doi.org/10.1016/j.spc.2022.06.016

Lin, J.H., Lii, P.C., Huang, F.W., & Chen, S. (2019). Cross-Border Lending, Government Capital Injection, and Bank Performance. *Int. J. Financial Stud.*, *7*(2), 21. https://doi.org/10.3390/ijfs7020021

Liou, K.T. (2013). The Financial Crisis and the Challenge of Government Regulation. *Public Performance & Management Review*, *37*(2), 208–221. DOI:10.2753/PMR1530-9576370201

Liu, J., Tao, Q., Hou, W., & Zhang, T. (2016). Systematic risk, government policy intervention, and dynamic contrarian investments. *International Review of Economics & Finance*, *43*, 334–343. https://doi.org/10.1016/j.iref.2015.12.006

Ma, S., He, Y., Gu, R., & Li, S. (2021). Sustainable supply chain management considering technology investments and government intervention. *Transportation Research Part E: Logistics and Transportation Review*, *149*. https://doi.org/10.1016/j.tre.2021.102290

Makin, J.H. (2009). A Government Failure, Not a Market Failure. *Commentary (New York, N.Y.)*, *128*(1), 16–20.

Manuela, W.S., & de Vera, M.J. (2015, October). The impact of government failure on tourism in the Philippines. *Transport Policy*, *43*, 11–22. https://doi.org/10.1016/j.tranpol.2015.05.016

Matchaya, G., Nhamo, L., Nhlengethwa, S., & Nhemachena, C. (2019). An Overview of Water Markets in Southern Africa: An Option for Water Management in Times of Scarcity. *Water*, *11*(5), 1006. https://doi.org/10.3390/w11051006

Mhlanga, D. (2020). Industry 4.0 in Finance: The Impact of Artificial Intelligence (AI) on Digital Financial Inclusion. *Int. J. Financial Stud.*, *8*(3), 45. https://doi.org/10.3390/ijfs8030045

Moore, R. (2013). Standardization: A tool for addressing market failure within the software industry. *Computer Law & Security Review*, *29*(4), 413–429. https://doi.org/10.1016/j.clsr.2013.05.009

Muratori, U. (2015). Contagion in the Euro Area Sovereign Bond Market. *Social Sciences*, *4*(1), 66–82. https://doi.org/10.3390/socsci4010066

Novokmet, A.K. (2021). Troubles with the Chf Loans in Croatia: The Story of a Case Still Waiting to Be Closed. *J. Risk Financial Manag.*, *14*(2), 75. https://doi.org/10.3390/jrfm14020075

Ofria, F., & Mucciardi, M. (2021). Government failures and non-performing loans in European countries: A spatial approach. *Journal of Economic Studies ahead-of-print(ahead-of-print)*. DOI:10.1108/JES-01-2021-0010

Oh, H., & Park, S. (2022). Does Corporate Governance Affect Labor Investment Efficiency? *Sustainability*, *14*(8), 4599. https://doi.org/10.3390/su14084599

Oh, H.M., & Shin, H.Y. (2019). A Study on the Relationship between Analysts' Cash Flow Forecasts Issuance and Accounting Information: Evidence from Korea. *Sustainability*, *11*(12), 3399. https://doi.org/10.3390/su11123399

Park, J.H., Lee, J., & Choi, Y.S. (2019). The Effects of Divergence between Cash Flow and Voting Rights on the Relevance of Fair Disclosure and Credit Ratings. *Sustainability*, *11*(13), 3657. https://doi.org/10.3390/su11133657

Perez-Sebastian, F. (2015). Market failure, government inefficiency, and optimal R&D policy. *Economics Letters*, *128*, 43–47. https://doi.org/10.1016/j.econlet.2015.01.012

Radygin, A.V., & Entov, R.M. (2012). Government Failures: Theory and Policy. *Voprosy Ekonomiki / Akademiia nauk SSSR, Institut Ekonomiki*, *12*(12), 4–30. DOI:10.32609/0042-8736-2012-12-4-30

Sharma, S. (2004). Government intervention or market liberalization: The Korean financial crisis as a case of market failure. *Progress in Development Studies*, *4*(1), 47–57. DOI:10.1191/1464993404ps075oa

Shen, J., & Chau, K.W. (2022). The Effect of Access to the Public Debt Market on Corporate Financing Decisions: The Case of REITs. *Sustainability*, *14*(13), 8008. https://doi.org/10.3390/su14138008

Shimizu, K., & Ly, K.C. (2017). Were regulatory interventions effective in lowering systemic risk during the financial crisis in Japan? *Journal of Multinational Financial Management*. DOI:10.1016/j.mulfin.2017.07.001

Sikorski, D. (2011). The Global Financial Crisis. *Contemporary Studies in Economic and Financial Analysis*, *93*, 17–90. DOI:10.1108/S1569-3759(2011)0000093004

Singh, R., & Bhattacharjee, J. (2019). Measuring Equity Share Related Risk Perception of Investors in Economically Backward Regions. *Risks*, *7*(1), 12. https://doi.org/10.3390/risks7010012

Smrčka, L. (2009). The financial crisis of 2008 was caused (mainly) by government interventions. *RePEc. ResearchGate.*

Stern, N. (2022). Towards a carbon neutral economy: How government should respond to market failures and market absence. *Journal of Government and Economics*, *6*. https://doi.org/10.1016/j.jge.2022.100036

Su, C.W., Cai, X.Y., & Tao, R. (2020). Can Stock Investor Sentiment Be Contagious in China? *Sustainability*, *12*(4), 1571. https://doi.org/10.3390/su12041571

Suleymanov, E., & Alirzayev, E. (2013). Government Role During the Global Financial Crisis. *SSRN Electronic Journal*. DOI:10.2139/ssrn.2370889

Tan, B., Igan, D., Martinez Peria, M.S., & Presbitero, A.F. (2021). Government Intervention and Bank Markups: Lessons from the Global Financial Crisis for the COVID-19 Crisis. *Journal of Banking & Finance*, *133*(2), 106320. DOI:10.1016/j.jbankfin.2021.106320

Tang, M., Li, Z., Hu, F., Wu, B., & Zhang, R. (2021). Market failure, tradable discharge permit, and pollution reduction: Evidence from industrial firms in China. *Ecological Economics*, *189*(04), 107180. https://doi.org/10.1016/j.ecolecon.2021.107180

Van Miegroet, H.J., Alexander, K.P., & Leunissen, F. (2019). Imperfect Data, Art Markets and Internet Research. *Arts*, *8*(3), 76. https://doi.org/10.3390/arts8030076

von Rosenstiel, D.P., Heuermann, D.F., & Hüsig, S. (2015). Why has the introduction of natural gas vehicles failed in Germany? Lessons on the role of market failure in markets for alternative fuel vehicles. *Energy Policy*, *78*, 91–101. https://doi.org/10.1016/j.enpol.2014.12.022

Wagner, N.F., & Breitenfellner, B. (2010). Government intervention in response to the subprime financial crisis: The good into the pot, the bad into the crop. *International Review of Financial Analysis*, *19*(4), 289–297. DOI:10.1016/ j.irfa. 2010.05.001

Wallis, J., & Dollery, B. (2001). Government Failure, Social Capital and the Appropriateness of the New Zealand Model for Public Sector Reform in Developing Countries. *World Development*, *29*(2), 245–263. https://doi.org/10.1016/S0305-750X(00)00092-9

Wang, G., Lou, X., Shen, J., Dan, E., Zheng, X., Shao, J., & Li, J. (2022). Corporate Carbon Information Disclosure and Financing Costs: The Moderating Effect of Sustainable Development. *Sustainability*, *14*(15), 9159. https://doi.org/10.3390/su14159159

Wang, J. (2018). Innovation and government intervention: A comparison of Singapore and Hong Kong. *Research Policy*, *47*(2), 399–412. https://doi.org/10.1016/j.respol.2017.12.008

Wang, X., & Li, M. (2022). Determinants of Regional Economic Resilience to Economic Crisis: Evidence from Chinese Economies. *Sustainability*, *14*(2), 809. https://doi.org/10.3390/su14020809

Xie, Y., Zhao, Y., Chen, Y., & Allen, C. (2022). Green construction supply chain management: Integrating governmental intervention and public–private partnerships through ecological modernisation. *Journal of Cleaner Production*, *331*. https://doi.org/10.1016/j.jclepro.2021.129986

Xin, X. (2020). Can a Dynamic Reward–Penalty Mechanism Help the Implementation of Renewable Portfolio Standards under Information Asymmetry? *Symmetry*, *12*(4), 670. https://doi.org/10.3390/sym12040670

Yamada, A., & Fujita, K. (2022). Impact of Parent Companies and Multiple Large Shareholders on Audit Fees in Stakeholder-Oriented Corporate Governance. *Sustainability*, *14*(9), 5534. https://doi.org/10.3390/su14095534

Yan, J., Cai, Z., & Zhou, R. (2021). Market failure and government failure in European debt crisis. *E3S Web of Conferences*. DOI:10.1051/e3sconf/202127503025

Yang, C., & Shen, W. (2022). Non-Financial Enterprises' Shadow Banking Business and Total Factor Productivity of Enterprises. *Sustainability*, *14*(13), 8150. https://doi.org/10.3390/su14138150

Yang, Gan, & Li. (2019). Role of Bank Regulation on Bank Performance: Evidence from Asia-Pacific Commercial Banks. *Journal of Risk and Financial Management*, *12*(3), 131. https://doi.org/10.3390/jrfm12030131

Yang, Y., Chen, X., Gu, J., & Fujita, H. (2019). Alleviating Financing Constraints of SMEs through Supply Chain. *Sustainability*, *11*(3), 673. https://doi.org/10.3390/su11030673

Yip, W., & Eggleston, K. (2004, January). Addressing government and market failures with payment incentives: Hospital reimbursement reform in Hainan, China. *Social Science & Medicine*, *58*(2), 267–277. https://doi.org/10.1016/s0277-9536(03)00010-8

Yoon, H., Kim, N., Buisson, B., & Phillips, F. (2018). A cross-national study of knowledge, government intervention, and innovative nascent entrepreneurship. *Journal of Business Research*, *84*, 243–252. https://doi.org/10.1016/j.jbusres.2017.11.040

Zaremba, A., Kizys, R., & Aharone, D.Y. (2021). Volatility in International Sovereign Bond Markets: The role of government policy responses to the COVID-19 pandemic. *Finance Research Letters*, *43*. https://doi.org/10.1016/j.frl.2021.102011

Zhang, X., & Yousaf, H.A.U. (2020). Green supply chain coordination considering government intervention, green investment, and customer green preferences in the petroleum industry. *Journal of Cleaner Production*, *246*. https://doi.org/10.1016/j.jclepro.2019.118984

Zhao, G., Zhou, P., & Wen, W. (2021). Feed-in tariffs, knowledge stocks and renewable energy technology innovation: The role of local government intervention. *Energy Policy*, *156*. https://doi.org/10.1016/j.enpol.2021.112453

Zheng, R., Zhan, J., Liu, L., Ma, Y., Wang, Z., Xie, L., & He, D. (2019). Factors and Minimal Subsidy Associated with Tea Farmers' Willingness to Adopt Ecological Pest Management. *Sustainability*, *11*(22), 6190. https://doi.org/10.3390/su11226190