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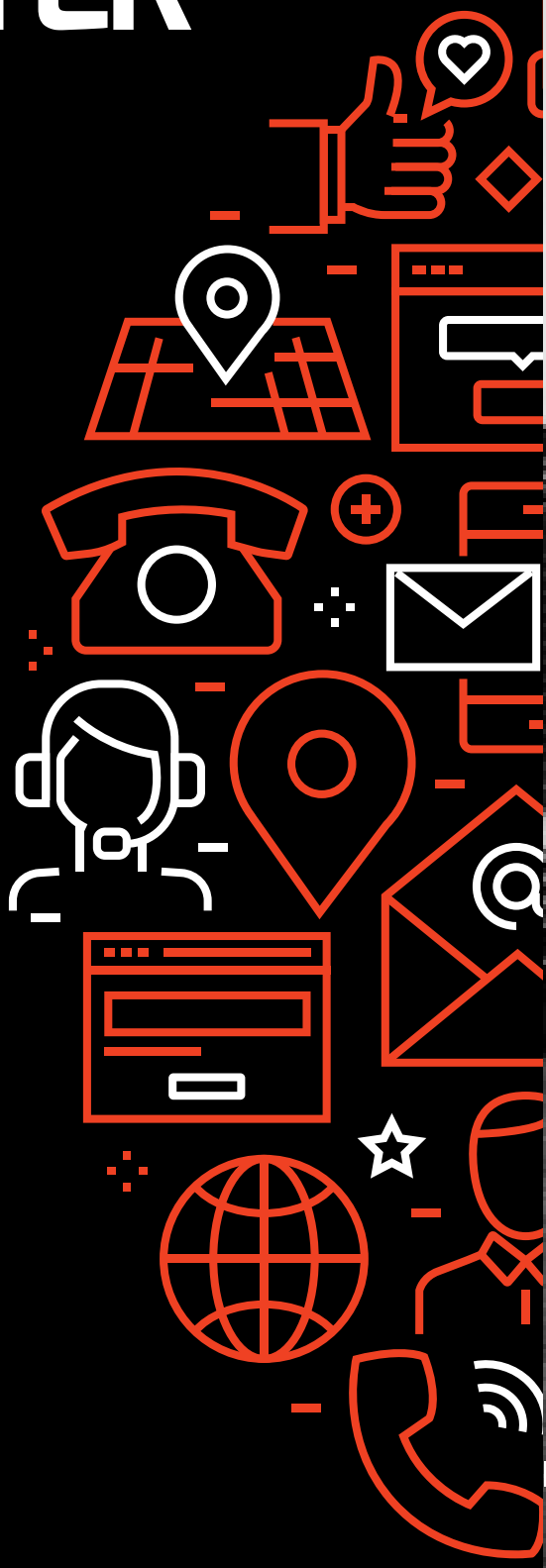

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EDITORIAL PREFACE

Dear readers of the International Journal of Insurance and Finance

It gives us great pleasure to welcome you in the fifth issue of our new journal in the field of insurance and finance. As indicated in the earlier issues, the journal was aimed to contribute the fields of insurance and finance. This journal presents papers intended to advance scientific knowledge of the insurance industry and finance sector as well as to stimulate dialogue between scientists and practioners in both two sectors.

Using a double blind reviewing process, IJIF will continue to publish original scientific papers. Scientists and practitioners in the field of insurance and finance are encouraged to submit their papers to our new journal online via the link https://www.ijif.net

IJIF has started its publication life since 2021 as peer-reviewed journal to publish articles written in English with this concept, and still continues to maintain this feature for now. We strongly believe that all actors of these fields, such as researchers, professionals, students and politicians, will continue to benefit from IJIF articles published.

Starting from the second issues, IJIF are still being indexed or abstracted by Crossref, IZOR, ISI, DOAJ, Euro Pub, ASOS, Ideal Online and IP Indexing databases.

We would like to thank the leading companies of the finance and insurance sector operating in the national and international arena, for their trust in IJIF, after the first issue of our journal was published. In addition, we are pleased to have valuable number of submitting articles by scientists and practitioners to our journal as the recognition of our journal becomes more widespread.

Finally, we would like to thank to our authors, the advisory and referee boards who contributed to the fifth issue; Türk Reasürans, Corpus insurance companie as well as TARSİM, Insurance Thought Center and Sivas Soft for their support to publication of this issue.

As the journal editors we will be honored to welcome to all national and international valuable scientists and practitioners who will submit and publish the articles of in the sixth issue.

Kind Regards,

Ahmet Şengönül
Ahmet Genç
Fuat Çamlıbel

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ORIGINAL ARTICLE

TURBULENCE IN DISGUISE IN THE BANKING SECTOR CREATE PANIC WITHDRAWAL OF MONEY IN BANGLADESH

Rana Al Mosharrafa

Abstract
Bankers may find it difficult to get deposits from households as a result of financial market turmoil. Negative returns on bank assets cause creditors to worry about financial stability, causing them to exaggerate the possibility of a bank failure in the future and withdraw money from banks in a panic. This article provides a simplified alternative for building beliefs about panic withdrawal. By lowering asset prices and raising the cost of bank borrowing, banks' balance sheet positions deteriorated, which caused worries for the depositors, who became panicked. This article discusses potential bank panic scenarios in Bangladesh due to several internal causes that vary countercyclically. Although the major issue confronting the banks was not illiquidity but rather insolvency due to a high percentage of non-performing loans, bank supervisory authorities may respond to this panic situation by offering liquidity support, government policy intervention, ensuring good governance, limiting the number of withdrawals, and so on.

Keywords
Bank Panic, Public Confidence, Good Governance, Liquidity Crisis, Non-Performing Loan

JEL Classification
G21, G32, H12, G18.

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1. INTRODUCTION

Customer deposits are the source of a bank's financial stability. The two main services that banks provide depositors are financial incentives for deposits and secure storage of deposited cash. Banks use these deposits to produce cash. It offers loans to borrowers, who subsequently repay the money at a fixed interest rate, affecting GDP growth (Mosharrafa, 2015a). Banks make profit from the transactions in-between these two types of transactions. Any financial institution's poor performance affects people's interactions. Profit-driven motivations, self-interested resistance from support executives, an under qualified workforce, and unfavorable competition have all bred problems that are putting the financial sector in a precarious position.

Bangladesh is the fastest-growing economy in the Asia-Pacific region. In an effort to become a middle-income country, the country is swiftly changing its social, economic, and technological landscape. Its notable GDP growth rate for the fiscal year 2021–2022 was 7.2%. An emerging economy like Bangladesh is expected to have high private sector credit growth, high investments, a booming stock market, and a dynamic financial system in light of all of the aforementioned elements; nevertheless, the financial system has been on a downward trend. Unsustainable and coercive development initiatives as well as client onboarding without proper appraisal have made the non-performing loan (NPL) situation worse. A multitude of demand and supply side issues have led to a liquidity shortage in the financial sector. High levels of NPLs have also been a result of banking system governance problems, which have undermined public confidence in the sector. When the public finds that banks frequently engage in unethical behavior and scams, they become alarmed and begin to lose faith in them. Losing confidence can have a variety of effects, such as moving the funds to another country or selecting other non-banking ways to save. Large-scale bank frauds have been commonplace in Bangladesh since 2012. It all started with the confession of the Hallmark Group's Tk 3,547 crore loan fraud with the state-run Sonali Bank.

Regaining "public trust" in the banking industry is critical in the post-pandemic period of global turmoil in order to avoid future economic issues. A sound banking system is thought to require strong public confidence. There is an alarming level of mistrust in the banking sector. Several reasons contributed to the liquidity crunch, in addition to the rising trend of NPLs.

The likelihood of a run is growing, putting pressure on deposit spreads and asset prices and weakening banks' financial conditions. The financial accelerator is increased as a result. Additionally, when the likelihood of a run increases, bank deposits begin to leave, dropping by about 12% and contributing to the development of a slow run (Gertler et al., 2016).

This article is also closely related to other recommendations for preventing runs, including deposit insurance (Diamond & Dybvig 1983), suspending convertibility (Wallace 1988), raising equity capital for banks (Gangopadhyay & Singh 2000), and state-contingent deposit payments with priority-of-claims provisions (DeNicolo, 1996). We concentrate on Bangladesh's banking system's public confidence crisis and panic withdrawal of money, which create a liquidity crunch. This article also offers some ideas that interested parties should consider in order to improve the situation.

2. LITERATURE REVIEW

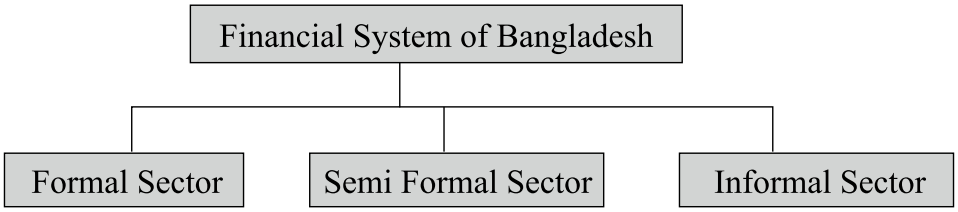
Banking panic refers to events in which the bank fails or declines when there is disorder or confusion in the financial market (Calomiris & Gorton, 1991). It occurs when people withdraw cash from banks or when bank debts are claimed to be converted to cash. Usually, the bank debt is comprised of liabilities that circulate as a medium of exchange- bank notes and demand deposits. When a bank a liquidity crisis, many of its clients believe that the bank may cease to work in near future and that is why they withdraw money, resulting in a bank run which is indeed a constant threat to financial systems (Graeve & Karas, 2014). As a bank run progress, there may be a positive feedback mechanism. The more

is the cash withdrawal, the default increases resulting in further withdrawals. The result of a bank run may disturb the stability of the bank due to a shortage in liquidity, and the bank may face sudden bankruptcy (Diamond, 2007).

3. THE STRUCTURE AND RECENT ADVANCEMENTS OF BANGLADESH'S FINANCIAL SECTOR

Bangladesh's financial system is divided into three main sectors: the formal sector, the semi-formal sector, and the informal sector. Each and every regulated financial institution is a part of the formal sector. The semi-formal sector consists of organizations that are governed by other regulations but are not governed by the Central Bank. Private intermediaries operating in the informal sector are totally unregulated. The financial system of the state is depicted in the following diagram as its basic framework:

Figure 1
Financial System



Source: Bangladesh Bank

There are 31 financial institutions, 61 scheduled banks, and 5 non-scheduled banks in Bangladesh's financial economy (Bangladesh Bank). The proactive and progressive strategy of Bangladesh Bank has led to the adoption of numerous automation initiatives within the banking sector in Bangladesh. Some of these initiatives are:

- Bangladesh introduced the Market Infrastructure (MI) Module for automated auction and trading of government securities.
- Providing automated Credit Information Bureau (CIB) service for prospective and existing borrowers.
- Introduced L/C Monitoring System
- The department of off-site supervision must receive weekly statements of position from all scheduled banks on every Thursday, by online submission within three working days.
- E-returns service has been introduced.
- An online export monitoring system is introduced.
- Started to work Bangladesh automated clearing house (BACH) arrangement.
- Electronic Fund Transfer (EFT) has been introduced
- Initiation of mobile banking services.
- Inauguration of internet trading both in DSE & CSE
- The online report submission tools are used by micro finance institutions to submit their reports to the regulatory body.
- Basel-III has been introduced since January 2015, and capital ratios will be fully implemented as of January 2019.
- Circulated. Policy Guidelines on Green Banking
- Recommendations for conducting stress tests for FIs and banks in a variety of challenging circumstances.

- Several policy measures to promote financial inclusion have been undertaken.
- Building up a separate risk management unit has been requested by the banks.
- Banks have been instructed to create separate subsidiaries for capital market operations.
- Banks are instructed to participate in Corporate Social Responsibility (CSR).
- Guidelines for insurance providers, money changers, and postal remittances have previously been disseminated.
- Public Issue Rules, 2006 and Mutual Fund Rules, 2001 have both been revised by the SEC.
- Merchant banks and mutual funds are authorised by the SEC to boost the participation of institutional investors.
- Insurance Act 2010 was formulated in a better shape.

In addition, a number of attempts have been made to prevent the industry's malpractices involving insurance commissions, agents, premiums, etc., as well as corporate governance issues.

4. THE SHORTCOMINGS IN THE BANKING SECTOR OF BANGLADESH

Recurrent instances of identical loan scams show that Bangladeshi banks, both publicly and privately held, have not learned from their mistakes. They failed to take meaningful steps to prevent such incidents from occurring in the future. These have had a significant negative impact on public trust in the banking sector. Prospective borrowers are now less likely to borrow money from banks. Borrowers are clearly moving away from institutional loan sources in favor of other non-institutional ones. Regaining "public trust" in the financial industry is essential in the aftermath of the epidemic and within the current climate of political upheaval on a worldwide platform in order to prevent future economic problems.

Banking adoption is still quite low. According to the World Bank, 47% of Bangladesh's adult population did not have a bank account in 2021, with 8% of adults alleging religious objections. Insurance and takaful penetration rates were both relatively low at 0.5% in 2021 (Natoor & Shawki, 2022).

The banking sector has been impacted by poor governance in a number of ways. Non-performing loans (NPLs) and/or financing facilities have been noted as the primary problem hurting Bangladesh's banking industry The abundance of banks exacerbated the situation. There are already too many competitors, which has tarnished the market's image. The human resource pool has not been able to keep up with the demand for skilled and experienced bankers to fill the new seats as the industry has experienced exponential growth. The majority of the more recent banks and NBFIs are therefore having difficulties. Such an occurrence has seriously harmed the bank, which is the main output producer of the financial system. Various organizations exist in the country. There are certain institutions in the country that provide high-quality training in banking-related issues, but sadly there aren't many of them. The Bangladesh Bank initiated single-digit borrowing and lending rates back in April 2020. Due to low rate of deposit, people might go for the stock market or invest elsewhere rather than keep their money idle in the bank which may create a problem in terms of collecting deposits. The illness in the banking sector is once again evident as a result of a variety of circumstances, including the central bank's "cautious policy stance with a tightening tendency," significant economic inflation, and the imprudent choice to cap the lending and borrowing rates of the banking sector. All of them have significantly reduced the liquidity of the banking system, particularly for the newcomers. The adverse effect of the lending and borrowing rate restrictions is that far safer government instruments, including Treasury Bills and Bonds, now pay higher interest rates than the highest deposit rate any bank in the nation can provide. Along with the NPL, the lending-deposit rate cap has also severely decreased the banking system's profitability, which is negatively harming the state of the industry as a whole (Mosharrafa & Islam, 2021).

5. FACING CHALLENGES IN THE BANKING ARENA

The banking sector in Bangladesh is currently having some difficulties. Inflation and an unstable foreign exchange rate in the post-Covid-19 period became a significant problem in this sector as a result of internal mismanagement. These factors have led to a significant trade deficit. The impact on the country's foreign exchange reserves will be lessened if the Bangladeshi government refrains from importing luxury products at this time. Introduce some margins in the case of LC opening to meet the situation. To alleviate the situation, provide money straight from the reserves of the central bank. Import restrictions on essential goods like food, infant food, fertilizer, gasoline, and electricity are eased. Discourage the importation of goods that are not urgently needed right now.

The banking industry, a crucial component of a nation's monetary and fiscal structure, is still suffering the effects of the Covid-19 pandemic. By implementing certain monetary and fiscal policies, Bangladesh Bank and the government have taken steps to stabilize the economy, especially the banking sector, in order to maintain robust growth in the years to come.

According to the World Bank, 61% of Bangladesh's population lived in rural areas in 2021, placing the Islamic finance sector at a hurdle due to the lack of Islamic banks' branch and digital banking networks there (Natoor & Shawki, 2022). A lack of sukuk investment options, Islamic derivatives, or hedging instruments, low awareness of Islamic products, a lack of standardization, insufficient use of fintech, a lack of incentives for sukuk issuers, and a human capital pool with insufficient skills all contribute to the underdevelopment of the regulatory framework for Islamic finance.

6. HOW RUMOR SPARKED PANIC AND BANK RUN IN BANGLADESH

A bank run occurs when many customers withdraw all their money simultaneously from their deposit accounts with a banking institution for fear that the institution is, or might become, insolvent. A self-fulfilling prophesy occurs when a public outcry against a bank culminates in a bank run that ultimately causes the bank to fail. There is a chance of default when more clients withdraw their money, which will lead to more withdrawals until the bank runs out of money. When several banks are involved, an uncontrolled bank run might result in bankruptcy and a general panic in the economy that could cause a recession. When depositors electronically remove huge sums of money from the bank without physically going inside, this is known as a silent bank run. Silent bank runs resemble regular bank runs; however, instead of physically taking cash out of the bank, funds are transferred using ACH transfers, wire transfers, and other techniques.

When the Bangladesh Bank governor quit on 15 March, 2016 and two deputy governors were abruptly fired in response to harsh criticism of the central bank's handling of the $101 million cybercrime, confusion and panic ensued. Around midnight on February 5, hackers used malware to penetrate the Bangladesh Bank system and steal the funds.

As of 2018, Tk. 22,501 crore was the total amount of money lost as a result of significant fraud, irregularities, and heists in the banking industry (USD 2.68 billion) (Khatun, 2018). Scams have increased as a result of stringent rules and political influence inside the banking sector, which has reduced public trust in banks and lowered the quantity of deposits. Due to their failure to honor payments and other responsibilities, the Chinese government has placed five regional private banks on a blacklist (Islam, 2019). A decrease in confidence has also been seen in the interbank money market. The majority of banks are hesitant to offer credit to organizations with questionable financial standing. Bangladesh ranks second in South Asia for illegal money outflows, according to Global Financial Integrity (GFI). According to the Swiss National Bank's 2017 annual report, Bangladeshis kept about USD 481 million in Swiss banks. It is obviously concerning to see so significant capital flight impacting the nation's cash reserves.

There are 61 commercial banks, over 40 NBFIs, and over 60 insurance companies in Bangladesh. In South Asia, Bangladesh had the highest concentration of commercial bank branches in 2016, with

75 branches per 1000 square kilometers of land (Khatun, 2018). Despite these numbers, only 47% of the population has access to financial services through the banking industry. Only 25% of them have full-service banking accounts. Due to their concentration in urban areas, commercial banks underutilize a substantial portion of the money circulating in remote areas. To address this issue and determine how banks are making the necessary profit to remain in business, mobile financial services (MFS) and agent banking operations, particularly for rural communities, are now being developed (Ferdous et al., 2015). There is a US dollar demand-supply gap as a consequence of high import costs and low export revenues. Due to growing dollar exchange rates versus taka, the foreign currency market has been unstable. Since the devaluation of the local currency, local banks were compelled to use funds from their reserves to settle letters of credit (L/Cs), which put pressure on the banks' total liquidity. In the interbank market, the nominal taka-US dollar exchange rate fell by 3.9%, but the Real Effective Exchange Rate (REER) increased by 2.7%.

7. RATIONAL FOR THE IMPADED ASSET QUALITY GROWTH OF THE BANKING SECTOR

The private sector in Bangladesh significantly relies on commercial banks to raise internal savings and to lend money to firms and investors due to the country's underdeveloped capital market. However, a high number of NPLs place a significant burden on the banking sector. The increased percentage of NPL is a sign that banks' asset recovery rates are deteriorating. This has had a detrimental effect on the economy's money supply and liquidity. Poor governance at the corporate and governmental levels is the primary cause of the rising NPL trend (Mosharrafa, 2015b).

The largest numbers of defaulted loans were rescheduled by Islami Bank Bangladesh, totaling Tk 4,814 crore, or 21% of all loans rescheduled in 2018. About 200 special approvals were granted by the central bank in violation of its own rules. Banks have been extending the rescheduling facility for years, but little improvement in the amount of NPL could be seen. Loans of Tk 12,350 crore were rescheduled in 2014, and over the following four years, the amount expanded by 87.94% (Uddin, 2019). The borrowers' cash flow should be taken into consideration when rescheduling. The reason for the increase in rescheduled loans may be due to inadequate due diligence, persuaded lending, fraud, and carelessness in adhering to risk management procedures.

8. BANGLADESH BANK INITIATIVES TO MINIMIZE PANIC WITHDRAWAL OF MONEY FROM BANKS

The Russia-Ukraine conflict, a broken supply chain, and a balance of payments deficit have all contributed to Bangladesh's current difficult situation. To prepare for an upcoming global recession and doom, it must find a balance between carefully watching the situation as it is while enhancing business flow and sustainability at the same time. Rumors about a catastrophic liquidity crisis in our banking system have been circulating on social media platforms, frightening users, especially depositors who contribute the majority of the banking system's funding sources. In fact, the people of Bangladesh shouldn't panic since the central bank of the nation has issued a statement denying any liquidity crisis in the banking sector and informing everyone that there is plenty of liquidity—Tk1.70 trillion worth, to be exact excess liquidity. The efforts made by Bangladesh Bank recently to control the flow of imports, including enabling 50% of ERQ (Export Retention Quota) accounts, moving money from the Offshore Banking Unit to the Digital Banking Unit, and lowering the NOP (Net Open Position) restriction from 20% of regulatory capital to 15% (Iftekhar, 2022). In the foreign exchange market, these actions have undoubtedly contributed to a portion of the required liquidity.

The banking industry will work with other stakeholders to advance the Fintech movement and the rebranding of "made in Bangladesh." The authority of the banking sector must strike a balance in the face of the impending global recession and doom by carefully monitoring the existing situation and

promoting business flow and sustainability.

The Bangladesh Bank warned banks that failing to pay import bills on time might result in the loss of their authorization to operate authorized dealer (AD) branches, which specialize in foreign exchange trading (Star Business Report, 2022). Additionally, the responsible bankers will be punished for the banks' refusal to pay import payments. Due to the ongoing global economic downturn, certain banks are currently having trouble collecting export revenues from foreign buyers who haven't made their payments on time. The dollar scarcity in banks has gotten worse since some exporters have either cancelled or delayed their export orders. As the cost of various items has climbed on the global market, the central bank is selling more dollars to government banks to cover the nation's import expenses. The Bangladesh Bank's dollar sales have increased partly as a result of efforts to accommodate domestic demand in light of the general situation worldwide.

On November 10, 2022, BB sold $107 million to a number of government banks, according to sources at Bangladesh Bank. The amount was $68 million and $131 million, respectively, on the 9th and 8th of November 2022. After selling dollars on November 10th, 2022, the reserve balance of the central bank was $34.25 billion. LC (letter of credit) openings for importing consumer goods and petroleum increased by 4.56% and 50.99%, respectively, in the first three months of the fiscal year 2022 compared to the same period the previous year. (TBS Report, 2022). In the period from July to September of FY23, the opening of LCs decreased by 8.57% for imports of capital goods, intermediate goods, and industrial raw materials. Moreover, because to greater import payments made earlier in the year, LC settlements jumped by 31.56% to $22.4 billion. The entire value of imports from July through September of this year was $19.34 billion, rising from $17.32 billion at the same time last year. The central bank must sell dollars in order to import essentials into the country (Economy Desk, 2022). However, if there is a greater outflow of dollars than there is an inflow of dollars, the amount of reserves will decrease. To increase remittances, the central bank needs to take immediate action. Dollar prices ought to be tied to market prices in order to stop transactions in hundi.

In FY21, because of low imports and significant remittance inflows during the epidemic, the Bangladesh Bank purchased almost $8 billion from banks. Bangladesh received remittances totaling more than $4 billion in the first two months of FY22. However, after the uniform dollar rate in September, the remittance flow sputtered. In October, 2022, the nation got $1.52 billion in remittances, the least amount in the previous eight months. According to the Export Promotion Bureau, exporters brought $4.35 billion in October, 2022, which is a 7.85% decrease from the same month last year (EPB).

The Governor of Bangladesh Bank (BB) has said that there will be no foreign exchange crisis from January 2023, as the country's exports and remittances have become surplus compared to imports (Economy Desk, 2022). Governor said a BB investigation found that the country's unusual import volume rose over $8 billion since the beginning of this year. Bangladesh Bank identified cases of under and over-invoicing of imported and exported items came to its notice during specials audit (Tribune Desk, 2022).

9. NECESSARY ACTIONS TO BE TAKEN IN THE BANKING INDUSTRY

Since Bangladesh's independence, there have been persistent default loans in the banking industry. The issue persisted through 2011 despite some progress made in the 1990s and in 2001 or 2002. Massive scale fraud involving default loans was revealed as a result of governance shortcomings and a lack of discipline in the banking sector. According to government estimates, the sum of our defaulted loans is over Tk 130,000 crore, but the IMF estimates it to be almost over Tk 300,000 crore. (Mansur, 2022). An unpaid loan obtained more than 20 years ago does not count as a default loan due to political pressure. The crisis then only became worse. Over Tk 200,000 crore in loans were provided by the government as part of an incentive program during the Covid-19 outbreak. Yet the beneficiaries of loans have showed reluctance to repay the money they received as "incentives". In order to overcome the culture of defaulted loans and the liquidity issue, the government must maintain effective

governance, shed its social responsibility or propensity to yield to political pressure, and begin properly enforcing the law. To get rid of corrupt decision-makers, the government needs to take over the weaker banks.

The banking industry as a whole is in a miserable condition. The return on investment is dropping. Banks are being exploited as an instrument of economic oppression, with the true investors being denied the rewards while the directors share the funds among themselves. To ensure effectiveness, the regulatory authority previously argued that the presence of so many banks would eventually promote financial inclusion with respect to the issuing of additional banking licenses. To save the economy from further complications, stakeholders may consider a variety of measures, some of which could be as follows:

- To keep an eye on prospective problems, a robust intelligence unit may be established and made operational in every bank. It is best to steer clear of any political reasons that can compromise loan scrutiny and standard criteria.
- Banks may also implement a policy for advertising that would inform the public of the advantages of banking. Banks that have experienced scams should inform the public of the steps they have taken and the results so far.
- The recent financial hoax and panic withdrawals have opened everyone's eyes in the banking industry, including politicians. A thorough investigation and the punishment of those responsible are pertinent for enhancing bank oversight and governance.
- A Commission for the Financial Sector can be established to absorb shocks brought on by financial and economic stress, enhance risk management and governance, and strengthen bank transparency and disclosures by adhering to Basel III regulations.
- It would be prudent to stop issuing licenses to new banks. Due to the size of the economy and the saturation of the banking industry, further banks are not necessary.
- As financial inclusion is essential for an economy's expansion, access to financial services in rural markets needs to be widened.
- For Islamic banks formation of Shariah Advisory Council as directed by the Bangladesh Securities and Exchange Commission in August 2022 need to work properly to support standardization and sukuk insurance.
- The policy on green bond financing for banks and financial institutions, including Islamic securities, released by the Bangladesh Bank in September 2022, needs to be implemented skillfully.
- In order to ensure sound governance and make informed judgments, former banking experts should be recruited as representative directors on the boards.
- Limit the number of withdrawals any customer is permitted to make or suspend all withdrawals as a means of calming the fear. In order to grow its cash on hand, the bank may also get more money from other banks or the central bank.
- A bank may artificially slow down the procedure when it faces the possibility of running out of money as a result of a bank run. The bank is temporarily closed by the government during a recession to stop customers from withdrawing all of their funds.
- The bank may borrow money from other banks or the central bank if its cash reserves are insufficient to cover the volume of cash withdrawals.

10. CONCLUSION

Bangladesh is currently at a pivotal point in its history as it is close to becoming a middle-income country. In order to successfully direct the economy toward a better position, the economy must be updated, and that will not be possible without the presence of a robust and sustainable financial system. Alternative means of finance, such as private equity companies, venture capitalists, angel investors, crowd funding, etc., have not expanded as much as they should have to offset the banking sector's lack of liquidity in Bangladesh.

One significant fraud in the banking institution ought to have raised the red flag. The issue needs to be handled right away with the utmost care. A dedicated banking authority will result in positive changes by addressing the anomalies. With the correct policy proposals and implementation guidelines in place, the banking sector will be able to overcome its problems and grow into a powerful support system for the economy. Banks may avoid a run situation by issuing liquid demand deposits and time deposits with low liquidation value. Making prompt actions is necessary right now to solve this condition in the banking sector in Bangladesh. The right steps and policies can help to minimize the threats to our financial system.

The financial sector needs to be greatly strengthened if goals, such as becoming a middle-income country are to be achieved. Banks in Bangladesh will need to come up with new ways to operate because of tighter international regulations, increased volatility in the global economy, and a lack of resources. To ensure compliance and the efficient operation of banks, more money and qualified human resources will be required in the near future.

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ORIGINAL ARTICLE

EVALUATION OF STOCK MARKET REACTION TO THE INCLUSION OF FIRMS IN THE ISE SUSTAINABILITY INDEX *

Belma ARSLAN

Abstract
This study examines the reaction of stock markets to the inclusion of companies in the Istanbul Stock Exchange Sustainability Index (ISESI). The Event study method is used to determine whether abnormal returns were obtained or not. Daily stock returns are used for the analysis of the event study, which ran from November 4, 2014, to April 29, 2016. The event date was also the announcement date November 4, 2015. Cumulative Abnormal Returns (CAR) in these event windows other than (+2,-2) event window for the two companies are not significant. It is important that the study is carried out on the sustainability index calculated for the first time.

Keywords
ISESI, Sustainability, Sustainability Index, Event Study, Efficient Market Hypothesis

JEL Classification
G14 - Q56

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1. INTRODUCTION

After the crisis of 2008-2009, short-termism is widespread in financial markets. Funds that were previously invested in stocks have started to trade in the short term. They are also expanding their international investments. The dominance of short-term currents in financial markets has made it difficult for investors and companies to focus on long-term economic indicators. Since the sustainability index is a long-term economic indicator, financial investors have not sufficiently considered the sustainability index.

The aim of this study is to raise awareness of sustainability and its relationship to the financial markets. In addition, general sustainability and financial sustainability similarities and differences are touched briefly. The terms "Socially Responsible Investment" (SRI) and "Corporate Social Responsibility" (CSR) are explained shortly. The historical development of sustainability is examined for Turkey and some of the large industrialized countries. To understand the importance of sustainability to investors, this study attempts to assess the stock market response to the inclusion of companies in the 2016 ISE Sustainability Index using the event study method.

In the literature, general studies (Curran & Moran (2006), Oberndorfer et al. (2013)) use event studies to measure the effect of including sustainability indices. The event study methodology is a good way to explain the daily effect. This method has also been used in the literature to explain the effects of stock splits or mergers. This method is based on the efficient market hypothesis. Efficient capital markets, according to the hypothesis, reflect all available and relevant information completely and instantaneously. Fama (1970) defined three types of efficiency. For detailed information on the random walk theory and the efficient market hypothesis, see Bodie, Kane, and Marcus (2013, Chap. 8). The first type is a weak form of efficiency; this form means that historical prices or returns are not sufficient to generate excess returns. Second is the semi-strong form of efficiency; No investor can achieve an excess return with publicly available information. And the last one is strong-form-efficiency; This form states that anyone can generate excess returns from any information publicly available or not.

The concept of financial sustainability is a new term for the world. After the 1990s, this topic started to attract people's attention. Investors started to value companies that were financially stable. Sustainable businesses are essential to the future of our world, and people should be aware of this issue. Investors should not focus on short-term gains and should encourage companies to make sustainable investments. The concept of sustainability includes not only environmental issues, but also human rights, the supply chain, banking criteria, anti-bribery, biodiversity conservation, health and safety, and a board of practice. Overall, this concept is beneficial for people and for the future of our world.

2. LITERATURE REVIEW

Sustainability is one of the important concepts used in various fields such as environment, economy, and finance. In the Sustainable Development Plan, priority is given to environmental factors when an input turns into an output in the economy's scarce resource. Therefore, sustainable development adds additional costs to companies' production processes. However, these costs are perceived positively by consumers and other parties. In recent years, this interplay and this dynamic in on the financial markets have been extensively studied. For instance;

Berhelot, Coulmont, & Serret (2012) aim to determine whether or not independent sustainability reports on Canadian companies listed on the Toronto Stock Exchange are being considered by capital markets. Analysis results show that the publication of a sustainability report makes sense for investors.

Wai Kong Cheung (2011) analyzes the consequences of inclusion or exclusion from the Dow Jones Sustainability World Index. The researcher uses standard event study method with two different data sets which include the announcement date and switching date. The results show a significant positive abnormal return only in the event window (AD-2, AD+2).

In addition, there are some studies that inclusion in a sustainability index is negative perception and makes negative returns that are listed in the stock market. Oberndorfer, Schmidt, Wagner, & Ziegler (2013) and, Ziegler & Schröder (2009) indicate that investors eliminate being included in such indices may impose extra costs on companies in the short run. Oberndorfer, Schmidt, Wagner, & Ziegler (2013) examine the impact of the inclusion of German companies in the Dow Jones Sustainability World Index (DJSI World) and Dow Jones STOXX Sustainability Index (DJSI STOXX) on stock performance from 1999 to 2002 using daily stock returns. To get healthier results, they apply a short-term event study approach based on a modern asset pricing model by Fama & French (1993), a three-factor model that explains excess return better than a one-factor model. In addition, they use the t-GARCH (1, 1) model. The results show that the inclusion of a sustainability stock index has a negative impact on stock performance. The German stock market punishes sustainable companies. Similar to this study, Ziegler & Schröder (2009) conducted an empirical study. They examine the determinants of inclusion in the Dow Jones Sustainability World Index (DJSI World) and the Dow Jones Stoxx Sustainability Index (DJSI Stoxx) for 16 different European companies. Panel probit models are used to estimate equations. The results show that there is an effect of firm size, which was determined by sales, and a negative effect on of financial health, which was determined by a specific criterion, such as sales and total assets.

Curran & Morran (2006) examine whether corporate social performance (CSP) is influenced by sustainability performance reputation. The event study methodology is used to study the relationship between positive and negative announcements and stock performance. The results show that inclusion or deletion from FTS4Good UK makes no significant difference.

Renneboog, Horst, & Zhang (2008) review social responsible investment (SRI) and corporate social responsibility (CSR). The authors claim that SRI has made significant strides globally over the past decade, reflecting growing investor awareness of social, environmental, ethical, and corporate governance issues. Last but not least, the authors conclude their study with very valuable recommendations. One examines the incentive structures in the SRI industry, and the second conducts additional research to understand the impact of SRI on financial institutions.

Ahern (2009) creates a benchmark study. For example, Brown & Warner (1985) selected samples at random, but Ahern selected samples in a controlled manner to determine which method is most convenient to measure the effect of inclusion indices For this purpose, many simulations were made. The data set includes daily returns from 1965 to 2003. The final conclusion of the study is that a generalization between a random sample from Brown & Warner (1985) and a non-random sample for the event studies is inappropriate.

Corrado & Zivney (1992) examine the sign test strength used in financial event studies. The study compares the two methods of event study, the parametric t-test, and the non-parametric rank test. The aim of this study is to make a comparison among event study methods, and as a consequence of extensive investigations, authors found that the sign tests and t-tests are overshadowed rank tests.

3. FINANCIAL SUSTAINABILITY

Sustainability has become more attractive over the last 30 years. When people realize that our world's bountiful resources are not unlimited, they try to find a way to a sustainable world. This attention sensitizes people to sustainability. As they invest, they begin to be curious as to whether the company's sustainability performance is sufficient to meet thresholds for membership in a sustainability index. The popular investment trend considers not only financially satisfying, but also ethical and social well-being. The general definition of corporate sustainability is a business approach that creates long-

term shareholder value by seizing opportunities and managing risks arising from economic, environmental, and social developments.

There are two main methods available for maximizing sustainability performance and financial performance. One is negative screening, and the other is positive screening. With the negative screening method, some industries are completely excluded from the indices. However, the positive screening procedure is much more sophisticated compared to negative screening. The purpose of this perspective is to create long-term value through the application of ethical and social strategies.

In the world, the Domini 400 Social Index (DSI) was the first known sustainability index. It was launched in 1990 by the North American rating agency. Floated in September 1999, the Dow Jones Sustainability World Index (DJSWI) is the first global sustainability index. The index is internationally recognized for its gauging and unbiased structure (Wai Kong Cheung, A. (2011). After the 2000s, sustainability is becoming increasingly attractive around the world. Robecosam, EIRIS and Sustainable Society Index are some of the independent research companies that compile rankings for countries worldwide.

In Turkey, Istanbul Stock Exchange Sustainability Index (ISESI) was launched on November 4, 2014. Ethical Investment Research Services Limited (EIRIS) Company and ISE signed a contract for evaluating the listed firms on the Stock Exchange. EIRIS evaluates companies under nine main headings: Climate Change, Human Rights, Supply Chain Management, Banking Criteria, Biodiversity, Anti-Bribery, Board Practices, Environment and Health & Safety. In 2015, ISE 50 firms and 13 volunteer companies (total 63) were evaluated, and the 29 of them were included in the sustainability index.

Table 1

Distribution of Sectors Percentage in Sustainability Index

Sector	Quantity	Percentage
Automotive industry	4	14%
Beverage	2	7%
Banking sector	6	21%
Energy	2	7%
Industrial	5	17%
General retailer	1	3%
Construction	1	3%
Multiple	2	7%
Transportation	2	7%
Telecommunication	2	7%
Food	1	3%
Gas and oil	1	3%
TOTAL	**29**	**100%**

Source: ISE

4. DATA AND METHODOLOGY

The event study is a method of measuring the impact of events on stock prices. The event study methodology assumes that the financial market is sufficiently efficient to interpret the impact of new information on firms' expected future returns (Dasgupta et al., 1998).

The definition of an efficient capital market is the market where stock prices fully and instantly reflect all available and relevant information. Fama (1970) defined three types of efficiency. The first one is weak-form efficiency which historical prices or returns are insufficient to generate excess returns. The second is the semi-strong form efficiency. No investor can achieve an excess return with the publicly available information in this form. And the last is the strong efficiency; This form states

that anyone can generate excess returns from any information whether publicly available or not.

A typical event study attempts to examine return behaviour for a defined group of companies that experience a common type of event, such as an announcement or stock split (Kothari & Warner, 2006). The event mentioned in the last sentence can occur at different times (announcement), or be accumulated at a certain point in time (regulation, index inclusion).

Here are the steps of the event study; The first step is to identify events and define the events window. For this study, the event date is November 3, 2015, and the event windows are (+2, -2) and (+5, -5) following Wai Kong Cheung, A. (2011). Second, set a criterion to select the companies to include in the analysis. In our study, for example, the companies are determined by the sustainability index. Third, predicting a "normal" return during the estimation window when an event does not occur. The only requirement is that the estimation window must be far from the event tag as it is not affected by the event. Ahern (2009) claims that using post-event data to estimate normal performance reduces specification error. Fourth, estimate the abnormal return within the event window, where calculated by subtracting the predicted return from the actual return Barr & Campbell (1997). There are several methods to predict an unexpected (abnormal) return or a normal (expected) return. Within these models, we benefited from the Market Model. The final step is testing whether an abnormal return is statistically significant.

Stock market data used for the event study comes from Yahoo Finance. The sample includes 29 companies, all included in the ISE Sustainability Index 2016. Daily stock returns are calculated from daily stock prices from November 3, 2014, to April 29, 2016. The formula used to calculate daily returns is shown below;

$$R_{jt}=\ln(P_{jt} / P_{jt-1}) \quad \textbf{(1)}$$

R_{jt} = the return of company j at day t, P_{jt} = the share price of company j at day t, $P_{jt}-1$ = the before-day share price of company j at day t. The market variable used in the analysis is ISE100

5. RESULTS

Event study analysis is applied to our data. Our sample includes the daily returns of 29 companies from November 3, 2014, to April 29, 2016. The event date is assumed to be November 3, 2015. The estimation periods are (-2, -253) for the (+-2) event window and (-5, -253) for the (+-5) event window. To obtain cumulative abnormal returns, we followed several steps. First, we regressed the company's return on the market return using the following equation

$$\text{Return} = \text{constant} + \beta_0 * \text{market return} + \Theta_i \quad \textbf{(2)}$$

Table 2

Event Study Results

	(+5,-5)				(+2,-2)			
Company name	**Constant**	**β0**	**Adj R^2**	**F-statistic**	**constant**	**β0**	**Adj R^2**	**F-statistic**
AEFES	-0.0001	0,7261	0,212	66,39	-0.0000	0.7206	0.2099	66.90
	[0.0012]	[0.0881]		[0.0000]	[0.011]	[0.0881]		[0.0000]
AKBNK	-0.0000	1.4124	0.8251	1147.31	-0.0021	2.1407	0.4115	175.09
	[0.0005]	[0.0416]		[0.0000]	[0.0022]	[0.1618]		[0.0000]
AKSEN	0.0005	-0.1338	0.0031	1.76	-0.0019	0.7795	0.0444	12.58
	[0.0013]	[0.1008]		[0.1857]	[0.0030]	[0.2198]		[0.0005]
ARCLK	0.0009	0.6247	0.2724	91.97	0.0138	-3.9851	0.0571	16.08
	[0.0008]	[0.0651]		[0.0000]	[0.0137]	[0.9938]		[0.0001]
ASELS	0.0018	-0.0631	-0.0022	0.46	-0.0012	0.9050	0.0589	16.57
	[0.0012]	[0.0928]		[0.4972]	[0.0030]	[0.2223]		[0.0001]
BRISA	0.0000	0.8999	0.3520	132.97	-0.0004	1.0446	0.4021	168.49
	[0.0010]	[0.0780]		[0.0000]	[0.0011]	[0.0804]		[0.0000]
CCOLA	-0.0010	0.7224	0.3173	113.92	0.01795	-5.9430	0.0609	17.14
	[0.0009]	[0.0677]		[0.0000]	[0.0198]	[1.4255]		[0.0000]
DOAS	0.0008	1.1207	0.2548	84.10	-0.0016	2.0588	0.2338	77.00
	[0.0016]	[0.1222]		[0.0000]	[0.0032]	[0.2346]		[0.0000]
EREGL	-0.0000	0.7387	0.3024	106.33	-0.0023	1.5559	0.2152	69.26
	[0.0009]	[0.0716]		[0.0000]	[0.0025]	[0.1869]		[0.0000]
FROTO	0.0009	0.7159	0.2691	90.46	0.0200	-5.9421	0.0613	17.26
	[0.0010]	[0.0752]		[0.0000]	[0.0198]	[1.4302]		[0.0000]
GARAN	-0.0008	-0.2002	0.0045	2.10	-0.0040	0.9772	0.0407	11.57
	[0.0018]	[0.1381]		[0.1486]	[0.0039]	[0.2873]		[0.0008]
ISCTR	-0.0001	1.3642	0.7431	703.80	0.0027	0.34015	0.0051	2.28
	[0.0006]	[0.0514]		[0.0000]	[0.0031]	[0.2252]		[0.1322]
KCHOL	0.0007	-0.0058	-0.0041	0.01	0.0047	-1.3261	0.0735	20.75
	[0.0009]	[0.0740]		[0.9366]	[0.0040]	[0.2910]		[0.0000]
MGROS	-0.0006	0.8291	0.4170	174.79	0.0011	0.2433	0.0078	2.95
	[0.0008]	[0.0627]		[0.0000]	[0.0019]	[0.1416]		[0.0869]
OTKAR	0.0015	0.8752	0.1855	56.35	0.0088	-1.7563	0.0320	9.23
	[0.0016]	[0.1166]		[0.0000]	[0.0079]	[0.5781]		[0.0026]
PETKIM	0.0008	0.6685	0.3711	144.38	-0.0027	1.8940	0.1665	50.72
	[0.0007]	[0.0556]		[0.0000]	[0.0036]	[0.2659]		[0.0000]
SAFGYO	-0.0003	0.5091	0.1249	35.68	-0.0029836	1.4075	0.1514	45.43
	[0.0011]	[0.0852]		[0.0000]	[0.0028]	[0.2088]		[0.0000]
SAHOL	-0.0001	1.0469	0.6394	431.96	0.0453411	-14,8575	0.0671	18.92
	[0.0006]	[0.0503]		[0.0000]	[0.0472]	[3.4160]		[0.0000]
TAVHL	0.0013	0.4483	0.1129	31.91	0.0037301	-0.4445	0.0142	4.58
	[0.0010]	[0.0793]		[0.0000]	[0.0028]	[0.2078]		[0.0334]
TCELL	0.0001	0.7062	0.3473	130.28	-0.0007	1.1001	0.3048	110.16
	[0.0008]	[0.0618]		[0.0000]	[0.0014]	[0.1048]		[0.0000]
THYAO	0.0006	1.0665	0.4539	203.00	-0.0004	1.4506	0.4205	181.69
	[0.0010]	[0.0748]		[0.0000]	[0.0014]	[0.1076]		[0.0000]
TOASA	0.0015	0.7039	0.2141	67.18	0.0047	-0.3970	0.0061	2.53
	[0.0011]	[0.0858]		[0.0000]	[0.0034]	[0.2494]		[0.0334]
TSKB	-0.0007	-0.0036	-0.0041	0.00	-0.0046	1.1959	0.0693	19.54
	[0.0010]	[0.0806]		[0.9639]	[0.0037]	[0.2705]		[0.0000]
TTKOM	0.0002	0.6966	0.2987	104.52	0.01627	-4.9015	0.0625	16.53
	[0.0009]	[0.0681]		[0.0000]	[0.0168]	[1.2054]		[0.0001]
TUPRS	0.0021	0.7360	0.3098	110.10	0.0238	-6.8968	0.0664	17.65
	[0.0021]	[0.0009]		[0.0000]	[0.0228]	[1.6417]		[0.0000]
ULKER	0.0009	0.59575	0.1766	53.10	-0.0018	1.5692	0.1683	50.19
	[0.0010]	[0.0817]		[0.0000]	[0.0030]	[0.2214]		[0.0000]
VAKBNK	-0.0003	1.430427	0.7576	760.42	-0.0029	2.3383	0.3527	135.13
	[0.0006]	[0.0518]		[0.0000]	[0.0028]	[0.2011]		[0.0000]
VESTL	-0.0006	1.458034	0.2530	83.32	0.0015	0.6538	0.0315	8.08
	[0.0021]	[0.1597]		[0.0000]	[0.0032]	[0.2300]		[0.0049]
YKBNK	-0.0010	1.2290	0.2530	83.32	-0.0020	1.5811	0.5796	344.36
	[0.0005]	[0.0389]		[0.0000]	[0.0012]	[0.0852]		[0.0000]

We use the coefficients obtained from the equation (1) to calculate abnormal returns and cumulative abnormal returns. The results of the cumulative abnormal return (CAR) are shown in Table 5.2. Part A of the table provides results for the (+5,-5) window and Part B provides results for the (+2,-2) window. According to Panel A, the cumulative abnormal returns of 15 out of 29 companies are not significantly negative, and 14 companies are not significantly positive. Therefore, we reject the null hypothesis that the cumulative anomalous rate of return is zero for all firms between the window (+5, -5). In addition to t-statistics for the total cumulative anomalous return for all firms, they indicate rejection of the null hypothesis of zero cumulative anomalous rate of return for all firms. Field b of Table 5.2 provides results for the (+2, -2) window. Companies so-called GARAN and ULKER are just two companies showing significant negative cumulative abnormal returns. The other 11 companies have negative non-significant cumulative anomalous returns, and the remaining 16 companies have non-significant cumulative anomalous returns coefficients. Table 5.2 contains results for the cumulative abnormal rate of return for all companies. Again, panel A is for (+5, -5) windows, and panel B is for (+2, -2) windows. The results in Panel A show that the cumulative anomalous return of all companies is not significant. Therefore, we do not reject the null hypothesis. However, we reject the null hypothesis (Panel B). for a shorter window of events.

Table 3

Cumulative Abnormal Returns

Symbol of the Firm	Name of the Firm	Sector	Panel A (+5,-5)	Panel B (+2,-2)
			CAR	CAR
AEFES	Anadolu Efes Biracılık ve Malt Sanayi A.S	Beverage	-0.0566	-0.0315
			[-0.9578]	[-0.6269]
AKBNK	Akbank A.S	Financial	0.0070	-0.0402
			[0.2207]	[-0.9927]
AKSEN	Aksa Enerji Uretim A.S	Energy	0.0098	-0.0998
			[0.1227]	[-1.4222]
ARCLK	Arçelik A.S	Industrial	-0.0134	0.2234
			[-0.1994]	[0.8612]
ASELS	Aselsan Elektronik Sanayi ve Ticaret A.S	Industrial	-0.0174	-0.01876
			[-0.2734]	[-0.2369]
BRISA	Brisa Bridgestone Sabancı Lastik San. ve Tic. A.S	Industrial	0.01720	-0.0132
			[0.4896]	[-1.6530]
CCOLA	Coca-Cola Icecek A.S	Beverage	0.0370	0.3127
			[0.5935]	[0.7942]
DOAS	Dogus Otomotiv Servis ve Ticaret A.S	Automotive	0.0473	-0.0064
			[1.2200]	[-0.0808]
EREGL	Eregli Demir ve Celik T.A.S	Industrial	-0.0304	-0.0696
			[-0.4279]	[-0.8014]
FROTO	Ford Otomotiv Sanayi A.S	Automotive	-0.0144	0.2550
			[-0.3194]	[0.7124]
GARAN	T.Garanti Bankası A.S	Financial	0.1326	**-0.0888***
			[0.9610]	[-1.7203]
ISCTR	T.İs Bankası A.S	Financial	-0.0119	0.0405
			[-0.4347]	[0.5549]
KCHOL	Koç Holding A.S	Multiple	0.0475	0.0863
			[1.1604]	[1.2460]
MGROS	Migros Turk T.A.S	Basic Materials	0.0459	0.0989
			[0.6530]	[1.1415]
OTKAR	Otokar Otomotiv ve Savunma Sanayi A.S	Automotive	-0.0083	0.0951
			[-0.2033]	[0.7001]
PETKM	Petkim Petro-Kimya Holding A.S	Energy	0.0329	-0.0127
			[1.2588]	[-0.2020]
SAFGY	Saf Gayrimenkul Yatırım Ortaklığı A.S	Construction	-0.0025	-0.0417
			[-0.0868]	[-0.7709]
SAHOL	Hacı Ömer Sabancı Holding A.S	Multiple	-0.0120	0.6461
			[-0.3573]	[0.7136]
TAVHL	Tav Havalimanları Holding A.S	Transportation	-0.0457	0.0098
			[-1.0720]	[0.1287]
TCELL	Turkcell Iletisim Hizmetleri A.S	Telecommunication	-0.0029	-0.0361
			[-0.0665]	[-0.6460]
THYAO	Turk Hava Yolları A.O	Transportation	0.0464	0.0340
			[1.4424]	[1.1092]
TOASO	Tofas Turk Otomobil fabrikası A.S	Automotive	0.0295	0.0413
			[0.4525]	[0.4248]
TSKB	Turkiye Sınai kalkınma bankası	Financial	-0.0186	-0.0580
			[-0.2884]	[-0.8215]
TTKOM	Turk Telekomunikasyon A.S	Telecommunication	-0.0363	0.2461
			[-0.8229]	[0.7814]
TUPRS	Tupras- TUrkiye Petrol Rafinerileri A.S	Gas and Oil	-0.0375	0.2753
			[-0.6932]	[0.6907]
ULKER	Ülker Bisküvi Sanayi A.S	Food	-0.0400	**-0.1083*****
			[-0.8563]	[-3.3524]
VAKBN	Turkiye Vakıflar Bankası T.A.O	Financial	0.0591	0.0080
			[1.3063]	[0.3468]

Note: z-test statistics are provided in brackets.***, ** and * Significance at the 1%, 5%, and 10% levels respectively

6. CONCLUSION

This study examines the reaction of stock markets to the inclusion of companies in the Istanbul Stock Exchange Sustainability Index (ISESI) in 2016 on daily basis. Results indicate that at the (+5, -5) event window, there is not a significant CAR for any of the companies. When we examine at the firm basis, even though there is a strong positive influence at the cumulative abnormal returns across all companies at the (+2, -2) event window, only two companies are considerably impacted. At the (+2, -2) window, these companies' cumulative abnormal returns are negative. Oberndorf et al. (2013) find similar results. Accordingly, becoming a part of the 2016 ISE Sustainability Index has a short-term announcement effect, but this effect vanishes during the (+5, -5) event window. The findings that are obtained from the event study analysis are in the same way as Çıtak and Ersoy (2016), Curran & Morran (2006) and in contrast way with the aspect of Berhelot et al.(2012).

It is possible to expand this study in many ways. A growing number of companies will be selected for the ISE Sustainability Index in the future. Therefore, more event dates and more companies can be added to the study. It is also possible to conduct an event study with these two different types of events since some companies are excluded from the index. There is no limit to the number of inclusions or exclusions that can be evaluated simultaneously.

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ORIGINAL ARTICLE

FREIGHT FORWARDER LIABILITY (FFL) INSURANCE AN IMPLEMENTATION FRAMEWORK FOR TÜRKİYE *

Hakan ÖZCAN
İbrahim UZPEDER

Abstract
Freight Forwarder Liability Insurance, which is the subject of the study and is much needed, and currently not available as an insurance product in Türkiye. Article 19 of the Regulation on Freight Forwarders, published in 2018, requires liability insurance. This policy, which is currently needed, cannot be issued by Turkish insurance companies in accordance with the requirements. The aim of the study is to establish the general insurance conditions of the "Freight Forwarder Liability Insurance", which is not available in Türkiye, in line with the needs of both insurance and transportation stakeholders. In line with this purpose, it is aimed to determine the common needs by taking the attitudes of insurance companies, logistics companies, insurance brokers, loss adjusters and insurance regulators. In previous similar studies, it has been seen that different country practices and national legal functioning are taken as the basis. The novelty of this study is that it is based on the joint requirements of insurance service providers and users of FFL Insurance. The structure of FFL Insurance is described. By making general terms & conditions available for insurance, insurance companies – resident in Türkiye - will be able to provide coverage for these policies and reinsurance in case needed.

Keywords
Insurance, Freight Forwarder, Liability, FFL.

JEL Classification
G22, K33, L90.

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1. INTRODUCTION

There are no general Freight Forwarder Liability (FFL) Insurance clauses in Türkiye. Consequently, the reinsurance process becomes more complicated for FFL Insurance by Türkiye's insurance companies within Türkiye. They retain some risks they take in return for premiums and transfer the remaining risks to other insurance companies. In other words, reinsurance is the assurance of the liability of the insurance company, which means the insurance of the insurance (Açınan, 2005: 7). The most crucial purpose of reinsurance is the insurance transaction made to reduce the loss that an insurance company may incur due to their policy transactions (Alanya, 2003:11). Logistics service providers can purchase this FFL Insurance warranty either from a limited amount of domestic insurance company or directly from abroad via insurance brokers. In order To work out this setback, general clauses of FFL Insurance should be determined for Türkiye by considering the needs of logistics service providers, insurance companies, insurance brokers and public authorities regulating insurance legislation.

The role of the public sector in both social and economic lives continues to change as stated in the 11th Development Plan, 2019-2023 (SBB, 2019). Further, public sectors' both regulatory and interventionist functions are strengthened within the global economy. Insurance is the distribution of risk among people facing the same risk in return for a certain premium and guaranteeing it under certain conditions. It is also a risk transfer in which the losses faced by individuals result in support of other participants. Another definition of insurance states a bilateral contractual relationship in which the other party undertakes to pay losses if one party pays a premium to the other party and the other party provides indemnity in return for this premium. According to the Turkish Commercial Code, the insurance contract is defined as follows (Official Gazette, 2011): "An insurance contract means a contract under which the insurer promises, in exchange for a premium, to indemnify a loss caused by the materialisation of the danger (risk) having the consequence of harming the interest, measurable by Money, of the concerned person or to effect payment or to fulfil other performances based on the lifetime or upon the occurrence of certain events in the course of the lifetime of one or several persons." As can be understood from the expression 'in return for a certain premium' in all these definitions, the premium is the guarantee deposit paid by the insured against the risk taken over by the insurer.

The purpose of the study is to compose general clauses of the "Freight Forwarder Liability Insurance", which is currently unavailable in Türkiye, by aligning the needs of both insurance and transportation stakeholders. Corresponding to this goal, researchers aim to find out common needs by listening to the views of insurance companies, logistics service providers, insurance brokers, claim experts and public authorities regulating insurance. Previous studies have been based on different countries' insurance practices and functioning within a national legal system. The uniqueness of in this study is that it is based on the joint requirements of insurance companies and users of FFL Insurance. FFL Insurance structure has been discoursed by incorporating the claim process in the study.

2. FREIGHT FORWARDER

Donald Bowersox (1974), a major scholar among critical contributors to logistics and supply chain management, defined logistics as a safe and successful flow of material and information from the first point of supply to the final consumer. Therefore, logistics is concerned with the efficient and effective movement of goods among members of that particular supply chain; namely, to make the right products available in the right quantity on the right time and place. Transportation is one of the activities of supply chain management. Over the years, the number and types of companies involved in freight transportation have grown exponentially. Today, the transportation industry is highly heterogeneous, from small regional companies with few employees to global logistics service providers as multinational companies with thousands of employees. Freight transportation has become a dynamic and complex industry that includes highly specialised companies that play a specific role in the

transportation chain and meet general needs (Acar and Köseoğlu, 2020: 20).

A freight forwarder is a service agent who arranges shipments on behalf of a customer (the shipper) or consignee. A freight forwarder acts as an intermediary between the customer and the transportation sector (Çancı and Erdal, 2003: 5). From the customer's point of view, the freight forwarder carries out the transportation activities and assumes full responsibility for any delay or damage to the delivery of the goods. Reis and Macario (2019) classified the function of a freight forwarder into two main tasks:

1- Bringing together the freight transportation service: Setting up a freight transportation service means determining the most suitable transportation modes (maritime-rail-inland water-road-air) and choosing the carriers for transportation that are suitable for the needs of the customer (usually in international trade: exporter or importer).

2- Managing the freight transportation service: Executes the transportation service. The freight forwarder does the necessary work to ensure that all actors involved in the transportation of the shipment fulfil their responsibilities and duties according to the plan.

Freight forwarders, broadly termed as logistics service providers, are not required to own any assets such as vehicles or loading terminals. They can meet the transport needs of carriers and other transportation businesses (Reis and Macario, 2019: 5). Türkiye's Road Transport Law, dated July 10, 2003, defines 'transport broker' as "a person whose occupation is to haul goods in his own name and on behalf of a client for a fee". The definition of freight forwarder (in Turkish: Taşıma İşleri Organizatörü) in the context of current international trade and business organisations. is specified in the Regulation on Freight Forwarders, first issued on January 8 2018. This Regulation covers individual and legal entities who have a certificate of warrant in the field of freight transport and vehicles with foreign license plates operating in the field of freight transportation, provided that they comply with international agreements.

3. LITERATURE

Brown (1990) investigated the relationships between freight brokers and carriers involved in road freight transportation in the USA. The number of freight broker enterprises had increased from 100 in 1975 to more than 6000 in 1988. If cargo loss or damage occurs in a shipment arranged by the freight broker, the shipper applies to the carrier, not to the broker. However, in practice, the freight broker assists the shipper in preparing relevant documents and in the damage processes in case of damage. However, this should not mean that the freight broker has no responsibility. In case of transporting cargo to a carrier with under-collateralised insurance, there is a possibility that the freight broker may be liable.

The author of the INCOTERMS 2010 guide of the International Chamber of Commerce (ICC) and Swedish lawyer Jan Ramberg (1998) states that freight forwarders have an important role in international trade. He distinguishes a freight forwarder's functions to act as follows:

1- Agent only on behalf of the customer or performing carrier

2- Contracting carrier undertaking carrier liability without performing transportation

3- Carrier performing transportation

Freight forwarders, who have been engaged in consolidation operations for container freight during 1970s, changed their business activities from an 'agent' role to a 'principal' role. In the capacity of principal, freight forwarders became responsible toward their customers in case cargo is lost or damaged. With the evolution of freight forwarders' functions as logistics service providers, cargo insurance was inadequate in terms of liability (Ramberg, 1998).

The International Federation of Forwarders' Associations (FIATA), headquartered in Zurich, was founded in Vienna in 1926 and is the world's largest non-governmental organisation representing freight forwarding and logistics industry. As Ramberg (1998) contended, a common transportation regulation can solve the liability issue by providing a system that offers better protection from all aspects with respect to unimodal transportation regulations. FIATA first established the FIATA Model Rules

for Freight Forwarding Services in 1996 for the issues that the aforementioned common transportation regulation could not address. The insurance clause of the October 2019 revision of the model rules states that the freight forwarder will not take out any insurance unless a written instruction is given from the customer. In addition, to create a uniform working standard for freight forwarders, FIATA has created various template documents and forms. Those FIATA logo documents are recognised as documents of tradition and trust serving international trade. (FIATA, 2019a; FIATA, 2019b)

Sarma (2014) discusses that freight forwarders in India traditionally played the role of 'agent' as a link between cargo owners and carriers, but nowadays, they have assumed the role of 'principal' with the involvement of multimodal transportation, containerisation and freight consolidation, warehousing, packaging, etc. as various integrated logistics activities. Therefore, since freight forwarders perform either as 'agent' or 'principal' or both roles, they are expected to specify the services they provide and decide upon appropriate insurance coverage corresponding to their responsibilities.

Tushevska (2014) analysed theoretically complex role and responsibility of freight forwarders in Macedonia. In civil law, the concept of indirect representation is applied to freight forwarders. For example, German Commercial Code elucidates that the freight forwarder is not a carrier. Whereas in common law systems, freight forwarder liability has been studied by many factors to define the scope and type of liability. Anglo-Saxon legal systems seem more in line with the current definition of freight forwarder, however, Continental Europe legal systems have identified the dilemma on whose behalf and account freight forwarder acts.

Xiaoqiang (2007) pointed out the great development of international freight forwarding industry with rapid growth of China's economy and foreign trade. International freight forwarders are likely to face many risks related to competition in the global market. By analysing the basic understanding of international freight forwarders in China and the situation regarding the liability insurance, a study was conducted to establish the liability insurance for international freight forwarders.

Jovanović (2019) conducted a study on the definition of standard risks and the preparation of the insurance contract for warehouse operators and freight forwarders in the Republic of Serbia. According to domestic and foreign legal codes and legislation, "standard risks" were analysed, and suggestions were made. In order to serve this purpose, various recommendations have been made to improve the text for clauses of the Law on Contracts and Torts, and of the Draft Labour Code intended for Serbia. The author concludes that both warehouse operators and freight forwarders would require insurance for storage and shipping services.

According to Anggorowati (2017), freight forwarding is significantly developing business in Indonesia. Business activities of freight forwarders have increased with as sustainable imports and exports. They reckoned that Indonesia's growth in production, trade and retail makes the primary reason for the existence of freight forwarders. Nonetheless, worsening global economic conditions cause fierce competition among freight forwarders.

Multimodal transportation means the transportation of goods with a single document from a pickup point to till a delivery location with at least two modes of transportation, regardless of the number and type of transportation, with a single document. Zelenika et al. (2011) proposed a liability insurance model for Slovenia aiming at efficient operation of multimodal transportation. And they made a growth projection for the following 15 years.

When previous studies of freight forwarder liability insurance have been reviewed, it is noticed that new insurance products and applications are analysed generally based on international trade/business practices. There are local studies in countries with significant insurance penetration. It has been recognised that freight forwarder liability insurance is a recent application for many countries. Studies have been mainly carried out on the basis of a particular country's own domestic and international legal systems.

4. RESEARCH

4.1. Methodology

Qualitative research approach was selected as the research methodology. It was deemed appropriate to carry out the study with a qualitative research approach to obtain in-depth information about information such as the requests of the insured, the insurer and other parties and the problems experienced, to make an analysis and to settle the situation in detail on the sample. Patton (1987), Yıldırım and Şimşek (2005) and Ekiz (2009) also stated that qualitative studies provide in-depth information, insight and understanding of the event, phenomenon or subject that is the subject of the research compared to quantitative studies. Since this study aimed to investigate a situation (need) in depth, the study was designed as a descriptive particular case study.

It is possible to define qualitative research as "research in which qualitative data collection techniques such as observation, interview and document analysis are used, and a qualitative process is followed to reveal perceptions and events in a natural environment in a realistic and holistic manner" (Yıldırım and Şimşek, 2008: 39). Qualitative research is a method that adopts an interpretive approach to examine the research problem based on an interdisciplinary, holistic perspective. The facts and events on which the research is conducted are handled in their own context and interpreted in terms of the meanings that people attribute to them (Altunışık et al., 2010: 302). There is an effort to reach a deep understanding of the subject in qualitative research. In qualitative research, the deterministic approach is not prioritised, and a cause-effect relationship is not established between events. More emphasis is placed on verbal and qualitative analysis rather than numerical data and statistics. (Neuman, 2012: 224). First, the theoretical framework that will form the basis of the research should be clearly established. Second, researchers must create a systematic, feasible and flexible research strategy. A third important issue is converting research results into a consistent and meaningful report (Karataş, 2015:68).

A literature review on Freight Forwarder Liability (FFL) Insurance has been carried out, and problems experienced in practice have been identified. The research topic and requirements are uncovered by considering the authors' own experiences in the fields of insurance and logistics. While clarifying the research problem, criteria of importance and requirements have been considered. Since defining research problem directly affects other stages of this study, sufficient preliminary research has been done. In qualitative research, it is necessary to collect direct first-hand data on the chosen topic.

Observation, interview and document analysis methods are widely used in qualitative research. Since the validity of the data and the accuracy of the results are important, this study will make use of observation, interview and document review methods with respect to the characteristics of the target audience.

The sample of the study was determined according to the purposive sampling method. Purposive sampling method is useful in discovering and explaining facts and events in many cases (Yıldırım & Şimşek, 2013). Purposive sampling allows for an in-depth study of situations that are thought to have rich information (Flick, 2014).

This study is limited to five major insurance stakeholders related to the topic:

1. Association of International Forwarding and Logistics Service Providers (UTİKAD) and selected members
2. Insurance Association of Türkiye (TSB) and selected members
3. Association of Insurance and Reinsurance Brokers (SBD) and selected members
4. Association of Claims Professionals (TÜSED) and selected members
5. Insurance and Private Pension Regulation and Supervision Agency (SEDDK)

4.2. Stages of Research

The following topics are covered within questions in order to ask the insurance stakeholders:

1. Subject of the insurance (Guarantee)
2. Exclusions
3. Losses that can be incorporated in guarantee scope with an additional contract
4. Duration of insurance
5. Obligations of the parties in case of losses
6. Indemnity payment
7. Subrogation provisions
8. Statute of limitations
9. Court of competent jurisdiction
10. Documents required for the claims process

When the first draft of general terms and conditions had been prepared, the corresponding author visited the marine insurance department of a major domestic insurance company who has consistently the largest market share in Türkiye's maritime insurance branch total premium. After receiving their manager's and experts' views, the initial revision was counseled with a prominent lawyer in the area of commercial law who is an expert in about Transport Law training both insurance professionals and lawyers within industry associations.

Regarding the aforementioned ten themes, a question set has been prepared for a semi-structured interview. Interviews were conducted with six insurance companies with high market share in marine insurance among TSB members, six insurance brokers from SBD members, twenty freight forwarders from UTİKAD members, five claim experts from TÜSED members and finally, SEDDK officials.

Each of the major insurance stakeholders comprises of countable population size. The authors adopted a sample size corresponding to ten percent of each insurance stakeholder's population size. There are six insurance companies at present who are reselling FFL Insurance. Nevertheless, all the six insurance companies have been incorporated for an in-depth interview. There are 20 reinsurance brokers in Türkiye, where the authors talked to six reinsurance brokers more than planned two brokers. There are nearly 200 freight forwarders who are UTİKAD members as of 2022 and have official authorisation from by Ministry of Transport.

Consequently, 20 freight forwarders have been interviewed. Because there are 50 claim experts dealing with marine insurance, according to the Association of Claims Professionals, five claim experts were contacted for consultation. The claim experts individually participated in semi-structured interviews. Executives of both insurance companies and brokers who actively participated in the field study are in senior management organisations.

Following the above interviews with three major insurance stakeholders (insurance companies, brokers and freight forwarders), the Insurance Association of Türkiye commented on about the draft text of general terms and conditions during a committee meeting on of marine insurance. Insurance and Private Pension Regulation and Supervision Agency appointed a managerial official for this field study, and all the those data collected from the above-mentioned semi-structured interviews were evaluated with SEDDK. The last draft of general terms and conditions was prepared appropriately.

Concerned parties agree on the following clauses of the draft text: subject of insurance, duration of insurance, obligations of the parties in case of losses, indemnity payment, the statute of limitations, court of competent jurisdiction and documents for the claims process. While insurance companies would like to exclude unsuitable means of transport, extortion and fraud, improper stowage, missing official documents, and penalties from FFL Insurance, insurance brokers advocate for gross negligence, late delivery and penalties, and indirect damages to be covered by insurance policies. Freight forwarders require gross negligence, late delivery and packaging in the subject of insurance. Both insurance companies and brokers do agree on subrogation towards subcontractors. However,

freight forwarders demand that insurance companies surrender their subrogation towards a freight forwarder's subcontractor by facilitating an additional guarantee in an FFL insurance policy.

5. FINDINGS AND DISCUSSION

The inferences from interviews with major stakeholders bring about the following draft of the general conditions of FFL Insurance.

5.1. Subject of Insurance (Guarantee)

5.1.1. This insurance is about natural and legal entities,

who have obtained a certificate of authority or official authorisation in accordance with the relevant legislation in the field of freight transportation;

who carry freight/cargo on their its own behalf and account by using their facilities, capabilities and capacities;

who issues an invoice or draws up an agreement for transportation;

who perform storage, packaging, labelling, packaging, order management, customs, insurance, distribution, etc., logistics activities associated with transportation;

who have acquired the profession of providing transportation and logistics services using one or multiple modes of transportation and are given a certificate of authority by the Ministry; and covers their legal liabilities – during their activities – to freight/cargo owners about losses and damages related to or arising from freight/cargo in the transport position, in connection with the international convention, laws and general law

5.1.2. The parties have the right to decide on special conditions, provided that general conditions are not restricted.

5.2. Exclusions

The following cases are not covered by insurance

5.2.1. Intentional losses

5.2.2. Losses caused by gross negligence

5.2.3. Losses and damages caused by late delivery of freight/cargo

5.2.4. Transporting goods, paintings, works of art, precious stones, genuine real pearls, cash, valuables, documents, certificates, livestock and plants

5.2.5. Losses originating from defects due to the nature of freight/cargo, self-inflicted losses, losses arising from usual fluctuations in normal humidity, temperature

5.2.6. Loss or damage caused by the number, weight of items or insufficient markings and numbers on them

5.2.7. Losses due to lack of packaging or incorrect packaging

5.2.8. Losses caused by war, all kinds of war events, invasion, foreign enemy movements, combat (whether war has been declared or not), civil war, revolution, rebellion, insurrection and due to resul-

ting actions by police and military

5.2.9. Seizure, deprivation of property or interference by government or interventions by any other higher authority

5.2.10. All losses caused by ionising radiations or radio-activity contaminations from any nuclear fuel or from nuclear wastes as a result of the combustion of nuclear fuel or from causes attributed to them, and the military and disciplinary measures required by these

5.2.11. Losses resulting from the use of chemical, biological, biochemical substances, substances as weapons, or electromagnetic and public hazards, regardless of other causes

5.2.12. Losses due to panel provisions: fines, administrative, penalties, civil penalties

5.2.13. Losses arising from insolvency or delay in payment, the owner, lessee or operator of the vehicle transported or any other financial disputes involving the above parties

5.2.14. Losses incurred as a direct outcome of advances, repayments or the like; not used for its intended purpose, transferred or reimbursed; a wider range of resulting losses

5.2.15. Damages and compensations arising from the conclusion of contractual agreements

5.2.16. Bodily harm

5.2.17. Moral indemnity

5.2.18. Indirect compensation and loss of profit claims

5.2.19. Deliveries to countries prohibited and declared by the United Nations.

5.3. Losses That May Be Included in the Coverage with the Additional Agreement

5.3.1. Losses occurring outside the route specified in the policy

5.3.2. Casualties due to strikes, lockouts, industrial unrest, and acts of violence. Terrorist or political groups, riots and other civil unrest, regardless of the number of persons involved

5.3.3. Losses caused by an earthquake, landslide, storm, hail, lightning or volcanic eruption

5.3.4. Losses due to flood and flooding

5.4. Period of Insurance

5.4.1. Complete loading of freight/cargo and/or start of shipment causes the commencement of insurance coverage. The period of insurance ends with the delivery of freight/cargo to the destination specified in the agreement. Nonetheless, post-delivery periods originating from Transport Law and Insurance Law do endure.

5.5. Obligations of Parties in Claims Procedure

In case of loss, the insured;

5.5.1 To notify the insurer within five business days at the latest from the date of learning that the risk has occurred.

5.5.2. To take the necessary rescue and safety measures as if they are not insured and to comply as much as possible with the instructions given by the insurer for this purpose.

5.5.3. Upon the request of the insurer, to provide the insurer with the necessary information and documents, which are useful for determining the reasons for the occurrence of the risk in detail, determining the financial amount of loss and the evidence and exercising the right of recourse, and which can be provided for the insured and the policyholder, without delay.

5.5.4. To allow the insurer or its authorised representatives to make inquiries and investigations on the things covered by the insurance and related documents to determine the indemnity liability and amount and the rights of recourse.

5.5.5. To report the identities and addresses of the witnesses to the nearest competent authority if there are accidents that occur due to unjust or faulty acts of third parties and to provide an eyewitness report whenever possible.

5.5.6. In case of losses in bonded warehouses, the insurer can access inventory records and make additional claims to enable the policyholder and the insured to take additional actions.

5.5.7. If the insured or any of its agents willfully and grossly negligently violate the liability, the insurer is relieved of its obligation to pay indemnity.

5.5.8. In case of loss, the proof of the insured's absence of fault, negligence and liability belongs to the insured.

5.6. Indemnity

5.6.1. In case of realising the risk, the insured, the insurer, the policyholder or natural/legal entities who benefit from the insurance contract can freely appoint loss adjusters.

5.6.2. If there is an exemption in the concluded contract, this exemption indicates the amount that is under the responsibility of the insured and will be covered by the insured. If the requested compensation amount is below the exemption amount specified in the policy, no compensation will be paid by the insurer.

5.6.3. After the necessary information and documents are delivered to the insurer in full, provided that all the work of institutions other than the insurer has been completed, the insurer will carry out the necessary examinations within a maximum of 15 days and the compensation procedures will be completed.

5.6.4. The insurer has the right to negotiate directly with the third-party claiming loss and damage.

5.6.5. If a lawsuit is filed, the insurer may pursue the lawsuit on behalf of the Insured. The insured is obliged to give any necessary authority in this regard to the lawyer nominated by the insurer.

5.6.6. The costs of the lawsuit are paid by the insurer. However, these expenses cannot exceed the limit specified in the policy.

5.7. Subrogation

5.7.1. After the insurer pays the indemnity to the party in loss, it reserves the freight forwarder's right of recourse to the subsequent carrier and depository.

5.8. Statute of Limitation

5.8.1. The statute of limitation will be applied apply in accordance with transport legislation.

5.9. Governing Jurisdiction

5.9.1. Turkish Courts and Law will be applied in disputes arising from this contract.

5.10. Documents Requested After Loss

5.10.1. In case of loss, the insurer may request following documents concerning the damage. Apart from these documents, additional documents may be requested depending on the damage.

5.10.2. Documents that may be requested after loss:

1. Official report
2. Claim letter
3. Vehicle license information
4. Driver's license
5. Contract of carriage (between freight forwarder and subcontractors)
6. Customs entry/exit declaration
7. Official documents according to the type of loss (traffic accident report, firefighter report, theft report, not found letter, etc.)
8. Documentation concerning freight/cargo
9. Freight charge certificate

6. CONCLUSIONS

It has been observed in previous studies regarding Freight Forwarder Liability Insurance that different country practices and national legal systems are taken as the basis. The novelty of in this study is that it is based on the joint requisitions of both insurance services providers and users of FFL Insurance. Including the damage process in the study; The structure of the liability insurance is elaborated by incorporating the claims process in this study.

Türkiye's insurance industry produced approximately 12 billion USD of insurance premiums by 2022 year-end. The industry's share in national income is approximately 1.3% and per capita premium production is 135 USD. Compared to OECD countries, Türkiye's insurance penetration is far below the OECD average. For Türkiye to reach the OECD average in insurance, it needs to increase its premium production four times. Motor insurance constitutes more than half of the total premium production. The transportation and logistics industry has a central role in increasing insurance premium production. It will contribute to premium production significantly not only utilizing marine insurance but also indirectly to other insurance branches.

Preparing FFL general terms and conditions will significantly contribute to both the insurance and logistics industries. The underlying reason for this research has been that freight forwarders face

noteworthy difficulties in guaranteeing their liabilities with an insurance policy. Since general terms and conditions have not been defined for FFL Insurance in Türkiye's insurance legislation, domestic insurance companies struggle with their market offering. Insurance companies issue such policies by direct foreign reinsurance or transfer to another branch. Freight forwarder liability insurance policies issued by foreign companies result in fund transfer from Türkiye to abroad.

When these general terms and conditions are included in insurance legislation, insurance companies can do reinsurance more easily and will have better provisions in order to guarantee situations that they were previously unable to bear as risks along complex transport chains in international trade. Further, more domestic insurance companies will be able to offer FFL Insurance with multiple options of coverage in order to match risk management needs of logistics service providers.

FFL Insurance has been constructed as a liability policy adapted to Türkiye's general environment. The draft text of general terms of conditions has been prepared in order to reconcile needs and requirements of both the insured and the insurer makes this study genuine in alignment with Türkiye's regulatory framework. Once general terms and conditions are officially published for FFL Insurance, increase insurance premium production will trigger Türkiye's overall insurance penetration and will be a major factor in reducing the import of financial services such that it will have a positive effect on Türkiye's current account balance.

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ORIGINAL ARTICLE

AN INSPECTION OF THE RELATIONSHIP BETWEEN THE INSURANCE AND BANKING SECTORS IN TÜRKİYE: A TIME-VARYING ASYMMETRIC CAUSAL RELATIONSHIP

Ayyüce MEMİŞ KARATAŞ

Abstract
Using yearly data from the Turkish insurance and banking sectors, the current research investigates the relationship between the insurance and banking sectors for the years 1983 to 2020. In contrast to earlier studies in the literature, the time-varying asymmetric causality test was implemented to see how the variables were linked within the different sub-periods. According to the asymmetric Hatemi-j (2012) causality test, it has been discovered that there exists a bidirectional causality between both positive and negative shocks of the total insurance density (TID), broad money supply (BRM) and private sector credit (PSC) variables. Time-Varying test results have shown that there is an asymmetric causality relationship between the data for only a short period and this causality relationship is not permanent.

Keywords
Insurance Sector Development, Market Sector Development, Time-Varying Asymmetric Causality.

JEL Classification
G10, G20, C50.

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1. INTRODUCTION

The insurance business may experience a significant increase from the financial especially banking development. This may be because customers may have more faith in other financial organizations if banks are operating efficiently. Increased rivalry with other financial industries, particularly insurance firms, may result from a more developed banking industry. This claim is especially pertinent to banking-type goods, such as savings instruments, provided by insurance companies (Lorent, 2010).

The banking industry mostly purchases protection, whereas the insurance sector primarily sells protection for investment or portfolio management (Rule, 2001; Haiss & Sümegi, 2008). Thus, credit risk has been massively transferred from banks to insurance companies, giving them a more pivotal role in banks and the economy (Haiss & Sümegi, 2008).

In addition, According to Akpınar & Yüksel (2018) Banks and insurance firms have already amalgamated to form financial institutions. The merger crisis effect in either of the firms will lead the other to be affected as well. Insurance businesses are experiencing depreciation similar to the banking sector as a result of economic crises. Because insurance companies invest some of the premiums they collect in long-term investment opportunities, if high-risk company shares are included in their portfolios, their investment portfolios may suffer in times of crisis. Similarly, the translation of the financial structural crisis into an economic crisis will have a negative impact on nations' macroeconomic metrics such as GDP and unemployment.

Banks confront a variety of risks from the uncontrollable external environment, which can result in massive losses throughout the course of their operations. As a result of the role of risk transfer in insurance markets, there may be a complementary link between the insurance and banking sectors, while a substitutive relationship exists due to the similar function of capital allocation. Nonetheless, the existing literature pays little attention to whether these two financial sectors' general interaction is complementary or substitutive (Liu & Lee, 2019).

2. THEORETICAL BACKGROUND

The theoretical link between insurance operations and banking credit is still uncertain. On the one hand, some experts believe the connection is mutually complementary (Beck & Webb, 2003; Liu & Lee, 2019). Banks and insurance businesses are essential components of a country's financial system. Because the products they offer are complementary, a collaboration between banks and insurance companies can take several forms. The expanding financial market, the development of new technologies, the universalization of the banking sector, and the expansion of non-banking activities have resulted in the fast creation of new channels of insurance product distribution through banks (Dichevska, Karadjova, & Jolevski,2018). To begin with, the risk protection provided by insurance markets may safeguard clients from a variety of hazards hence ensuring bank profits. Furthermore, throughout the economic growth process, banking sectors with a more efficient payment system might encourage the quick expansion of insurance companies. The two financial sectors, on the other hand, are more probable to have a substitutive relationship (Allen & Santomero, 2001; Haiss & Sümegi, 2008, Liu & Lee, 2019). Insurance products may have a detrimental influence on banks' market share in the intermediated savings market. This is known as the "savings substitution effect" (Liu & Lee, 2019).

The relationship between the expansion of the financial industry and the insurance business can be expressed in four different theories. These include the banking and insurance development neutrality hypothesis, the feedback hypothesis, the banking and insurance development demand-following

hypothesis, and the banking and insurance development supply-leading hypothesis (Dash, Pradhan, Maradana, Gaurav, & Jayakumar, 2020).

The supply-leading hypothesis states that as the banking industry becomes more sophisticated through financial services and the adoption of new technology, processes, and systems, it will be better able to offer other types of financial products, like insurance services, to a larger share of the population. To offer customers a broader range of insurance services, including for retirement, vehicles, homes, education, health, and investments in capital markets, many financial organizations employ a "one-stop center" strategy. The insurance business has advanced over the past 20 years by expanding its offerings beyond protecting savings, accidents, and premature mortality. Insurance companies have launched a variety of financial products, such as whole-life policies that pay interest and give customers money when they mature or policy dividends (Pradhan, Arvin, Nair, Hall, & Gupta, 2017; Dash et al. 2020).

According to the demand-following hypothesis, the demand for financial services will rise as the insurance sector expands its reach to a broader section of the people and offers considerably more comprehensive services to lower their risks. This could be a consequence of the banking networks serving as important channels for the dissemination of important life insurance services (Lorent, 2010). Banks have raised their viability because of increased rivalry from the insurance sectors in the markets that are typically served by the financial sector by implementing more effective networks, technology, and procedures to offer better value to their clients (Pradhan et al., 2017; Dash et al., 2020).

According to the feedback theory, the growth of the banking sector and the expansion of the insurance firms can both support and strengthen one another. The case in favor of bidirectional causation is that the growth of the banking industry is essential to the growth of the insurance market, and the growth of the insurance market unavoidably necessitates the growth of the banking industry (Pradhan et al., 2017; Dash et al., 2020).

According to the neutrality theory, the expansion of the insurance industry and the financial industry are separate from one another. The proponents of this theory contend that the growth of the financial industry has no bearing on the expansion of the insurance market. The research supporting this theory is presented in Liu & Zhang's (2016) studies.

3. LITERATURE REVIEW

Despite thorough research on the relationship between the financial industry and financial sector development and economic growth, the literature currently available only covers a small portion of the insurance market's activities and their connections to financial services, especially banking sector activities. The widely used securitization of money flows, which enables individuals to ensure future revenue through the ownership of financial assets, is correlated with financial development. The relationship between financial development and insurance sector development has been studied using cross-sectional, pooled, distinct panel data and time series in the literature that is currently available.

Outreville (1996) noted a favorable correlation between the expansion of financial development and life insurance using cross-sectional research. Like this, Li et al.'s (2007) research on Organisation for Economic Co-operation and Growth (OECD) nations indicated a positive correlation between the demand for life insurance and financial growth. They did not, however, adequately address the link between the growth of insurance and financial development.

New research shows that the insurance industry has expanded both quantitatively and qualitatively because of the general development of financial intermediation and the rise in risks and uncertainties in the majority of nations (Outreville,2013). Because of the fast rise in demand for life insurance policies, the insurance sector is also playing an increasingly important role in the financial market as a supplier of financial services to clients and a major source of capital market investment (Beck & Webb, 2003).

Pradhan, Bahmani, and Kiran (2014) in their study find a bidirectional causal relationship between the development of the financial sector and both economic growth and the development of the insurance sector and Pradhan et al. (2017) in their study find inter-linkages between the insurance and banking sector for developing countries within G20.

As a proxy of financial growth, Ward & Zurbruegg (2002) utilized the metric of private credit from banks and other financial institutions over GDP. The quantity of savings that are transferred to private borrowers through financial intermediaries who issue debt is known as private credit. In their two sub-samples, they demonstrated a highly significant positive relationship between financial growth and life insurance penetration.

The provision of protection against risks related to natural calamities and an unstable economic environment is one of the industry's main functions. Natural disasters and the erratic global economic climate over the past four decades have wrecked chaos in the banking industry and limited economic development in many nations (Pradhan, Arvin, Nair, Hall, & Gupta, 2017).

Considering the significance of handling the risks related to natural disasters and the unpredictability of the global economy, the current research will examine whether an active insurance sector will result in an active banking sector boosting prosperity in the economy through growth. Thus, the main goal of this research is to investigate the time-varying asymmetric causal connections between activities in the insurance market as well as the banking sector (Pradhan et al., 2017). This study fills an important gap in the literature because it is the first study in this view examining the time-dependent asymmetric relationship between the banking sector and the insurance sector in Türkiye.

4. METHODOLOGY

4.1. Data

The study covers 37 years. Yearly data for Türkiye ranging from 1983 to 2020 were acquired from the World Bank's World Development Indicators and the OECD Stat Database. The variables used were the total density as a premium per capita (TID), the broad money supply (M2) as a portion of GDP, and the amount of private sector credit as a percentage of GDP (PSC). For purposes of the modeling, each variable was transformed into its natural logarithm.

Total insurance density (life, non-life, and total insurance) indicates the average yearly premium per capita that one citizen in one nation pays on insurance products (Liu & Lee, 2019; Sawadogo, 2021).

When financial development is expressed as M2 money supply/GDP, the variable is called financial deepening. The M2 money supply is accepted as an important indicator of the financial system in developing countries where the banking sector is dominant. This variable may also be a suitable measure of monetization in nations prone to inflation (Outreville, 1990a).

Private credit, in the words of Levine et al. (1999), is the best indicator of financial growth. Due to the efficiency component of its measurement, private credit is greater than the size of the financial industry. Given that private-sector credit is more productive than public-sector credit, and has a more direct criterion of financial intermediation, the variable of private-sector credit to GDP (CPY) is used as an indicator of banking development (Araç & Özcan, 2014). According to Kar and Pentecost (2000), as the private sector's share of credit grows, the banking sector distributes resources more effectively. As a result, we use this indicator to assess banking development.

Table 1
Definition of the Variables

Variable	Variable code	Variable definition
Total Insurance density (life and non-life)	TID	Direct household (both life and non-life) premiums are paid per person in USD.
Broad money supply (M2)	BRM	A portion of gross domestic product.
Private sector credit	PSC	A portion of gross domestic product.

3.2. Estimation Method

Both the traditional and the time-varying versions of Hatemi-j's (2012) asymmetric causality test were employed in this research. The fact that there are asymmetric information and heterogeneous market participants in the market and that these participants do not react similarly to positive and negative shocks, the traditional causality tests that exist in the literature and do not take these shocks into account, Granger, 1969; Sims, 1972; Hsiao, 1981; Toda & Yamamoto, 1995; Hacker & Hatemi, 2006) revealed that it would give misleading results.

Granger & Yoon (2002) stated in their unique investigation that when the variables respond to shocks together, they are cointegrated, but there does not exist a cointegration connection among them when they respond independently, and they put forward a new cointegration relationship, which suggests that the relationship between variables can be different when they separate the variables into positive and negative shocks.

Hatemi-J (2012) developed this approach for bootstrap causality testing in his study. The y_{1t} and y_{2t} series, which are integrated series and whose asymmetric causality relationship is investigated, are defined as follows.

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{1,0} + \sum_{i=1}^{t} \varepsilon_{1t} \quad (1)$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{2,0} + \sum_{i=1}^{t} \varepsilon_{2t} \quad (2)$$

The positive and negative parts of the variables whose initial values are given in the above equations are defined as follows.

$$\varepsilon_{1i}^{-} = \min(\varepsilon_{1i},0),\ \varepsilon_{1i}^{+} = \min(\varepsilon_{1i},0)$$
$$\varepsilon_{2i}^{-} = \min(\varepsilon_{2i},0),\ \varepsilon_{2i}^{+} = \min(\varepsilon_{2i},0) \quad (3)$$

When the variables given in equations (1) and (2) are renewed in line with the positive and negative shocks in equation (3), equation (4) given below is obtained. Given in the equation, y_{1i}^{+}a positive shocks of the first variable, y_{1i}^{-} negative shocks of the first variable, y_{2i}^{+} positive shocks of the second variabe, and finally y_{2i}^{-} shows the negative shocks of the second variable.

$$y_{1i}^{+} = \sum_{i=1}^{t} \varepsilon_{1i}^{+},\ y_{1i}^{-} = \sum_{i=1}^{t} \varepsilon_{1i}^{-},\quad y_{2i}^{+} = \sum_{i=1}^{t} \varepsilon_{2i}^{+},\ y_{2i}^{-} = \sum_{i=1}^{t} \varepsilon_{2i}^{-} \quad (4)$$

In their study, Toda and Yamamoto (1995) added delay to the VAR model as much as the maximum degree of integration of the relevant series to out problems such as taking the difference of the series applied in the traditional causality tests, causing data loss, while looking for the existence of a cointegration relationship causes a pre-test tendency. Dolado & Lütkepohl (1996) suggested adding only one additional lag. In this study, an additional 1 delay was added to the VAR model, the appropriate delay length of which was determined by the Hatemi-J criterion, following the suggestion of Dolado & Lütkopohl (1996) (Yılancı & Bozoklu, 2014). Dolado & Lütkepohl (1996) have several steps to apply the causality test. In the first stage, using various criteria of the VAR model without performing the stationarity tests, the most suitable lag length (k) is determined. By adding 1 to the optimal lag length determined in the second stage (k+1), the VAR(k+1) model is estimated (Dolado & Lütkepohl, 1996).

The asymptotic distribution of the Wald test, which is distributed by $\chi 2$ with as many degrees of freedom as the number of restrictions, is affected by the fact that financial data are typically not normally distributed. Critical values will be acquired through bootstrap simulations to solve this issue. Both bootstrap critical values and Wald test statistics change over time.

Finally, in the Hatemi-J (2012) test, the Hacker & Hatemi-J (2006) test is applied to the components of the series (+/-). The basis of the time-varying causality method is developed upon the method constructed by Hacker & Hatemi-J (2006). The time-varying causality test, in contrast, examines subperiods of the sample rather than the entire sample as it does in Hacker & Hatemi-J's (2006) causality test.

Using the Caspi (2017) formula T(0. 01 + 1. 8/T), the study's number of windows was found to be 11. Asymmetric causality is applied for each window by advancing it by one unit to the last value. The 10% bootstrap critical value found in this observation interval is used to standardize the test statistic at every evaluation period. To understand normalized Wald statistics, values are plotted. Values above the "1" line in the graph denote the need to deny the fundamental claim of asymmetric Granger causality (Yılancı & Bozoklu, 2014).

3.3 Empirical Results

Since the method of adding 1 delay suggested by Dolado & Lütkepohl (1996) will be followed in the study, it is not necessary to determine the stationarity levels of the variables (Yılancı & Bozoklu, 2014; Uysal, 2020; Demirtaş, Özgür, & Soyu, 2021). The variables were first subjected to the Hatemi-J (2012) asymmetric causality test. The test outcomes are displayed in Table 2.

Table 2
The Asymmetric Causality Analysis

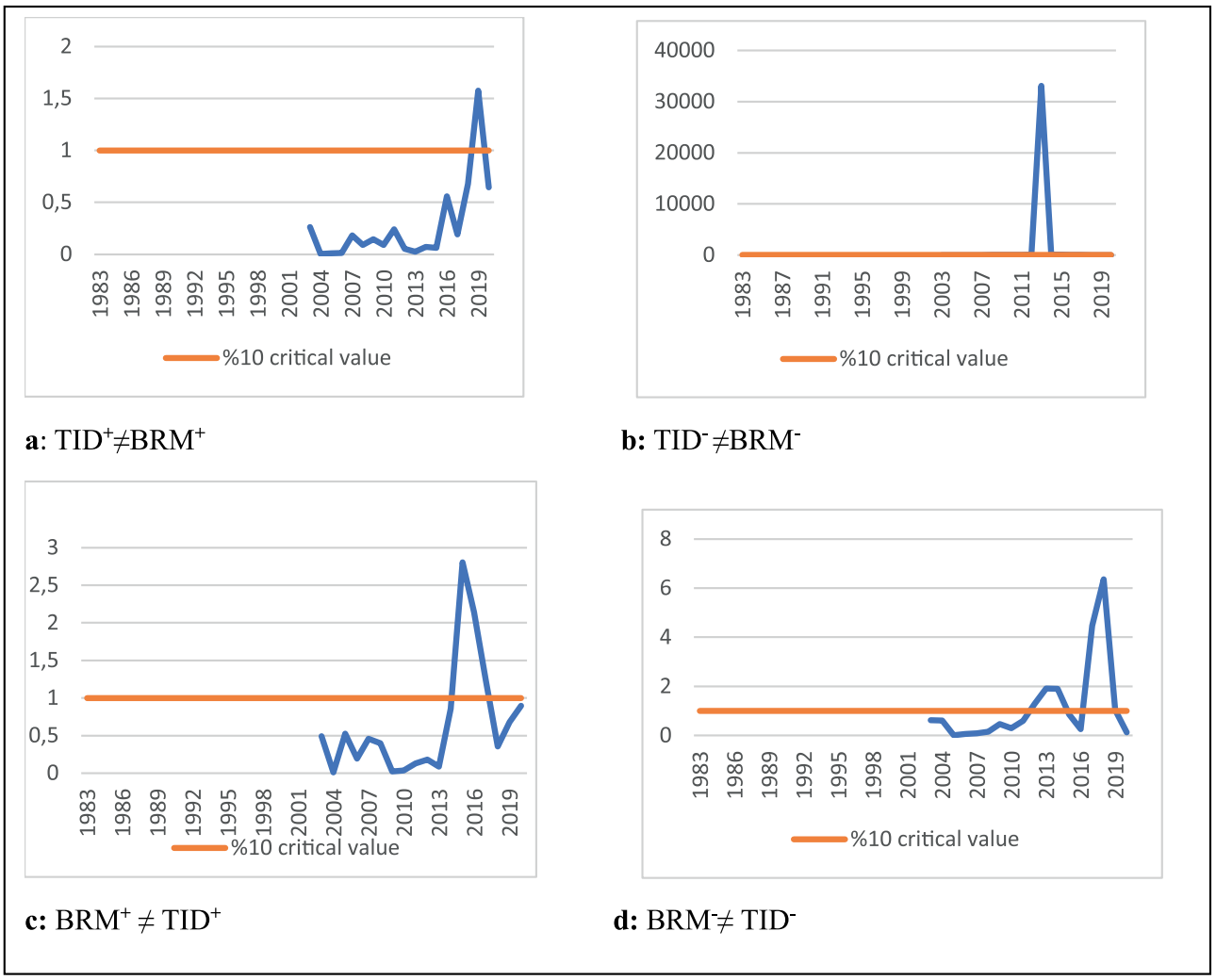
Hypothesis	Statistic of Wald test		Critical values for Bootstrap		
			%1	%5	%10
$TID^{+} \neq BRM^{+}$	30.224	***	12.757	9.699	8.114
$TID^{-} \neq BRM^{-}$	11.086	**	16.806	10.968	8.116
$BRM^{+} \neq TID^{+}$	97.770	***	12.568	9.329	7.983
$BRM^{-} \neq TID^{-}$	28.793	***	16.450	10.082	8.128
$TID^{+} \neq PSC^{+}$	118.278	***	13.734	9.704	7.911
$TID^{-} \neq PSC^{-}$	11.560	**	15.909	10.946	8.323
$PSC^{+} \neq TID^{+}$	28.175	***	10.053	5.052	2.301
$PSC^{-} \neq TID^{-}$	18.042	***	16.236	11.203	7.602

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Furthermore, we find the bidirectional asymmetric causality from broad money supply (BRM) and private sector credit (PSC) to total insurance density (TID). There is causality with broad money supply (BRM) and private sector credit (PSC) in positive and negative shocks in total insurance density (TID), and vice versa. All variables can provide significant information to explain the changes in positive and negative shocks. But the result in Table 2 came from considering the whole sampling time. Figures 1 and 2 display the outcomes of the time-varying asymmetric causality test implemented to determine whether these findings are stable.

Table 2 shows that there is an asymmetric causal relationship between total insurance density (TID) and Broad money supply (BRM) towards positive shocks and negative shocks in the same direction.

Figure 1:
Time-Varying Asymmetric Causal Relationship between TID and BRM Variables



a: $TID^{+} \neq BRM^{+}$

b: $TID^{-} \neq BRM^{-}$

c: $BRM^{+} \neq TID^{+}$

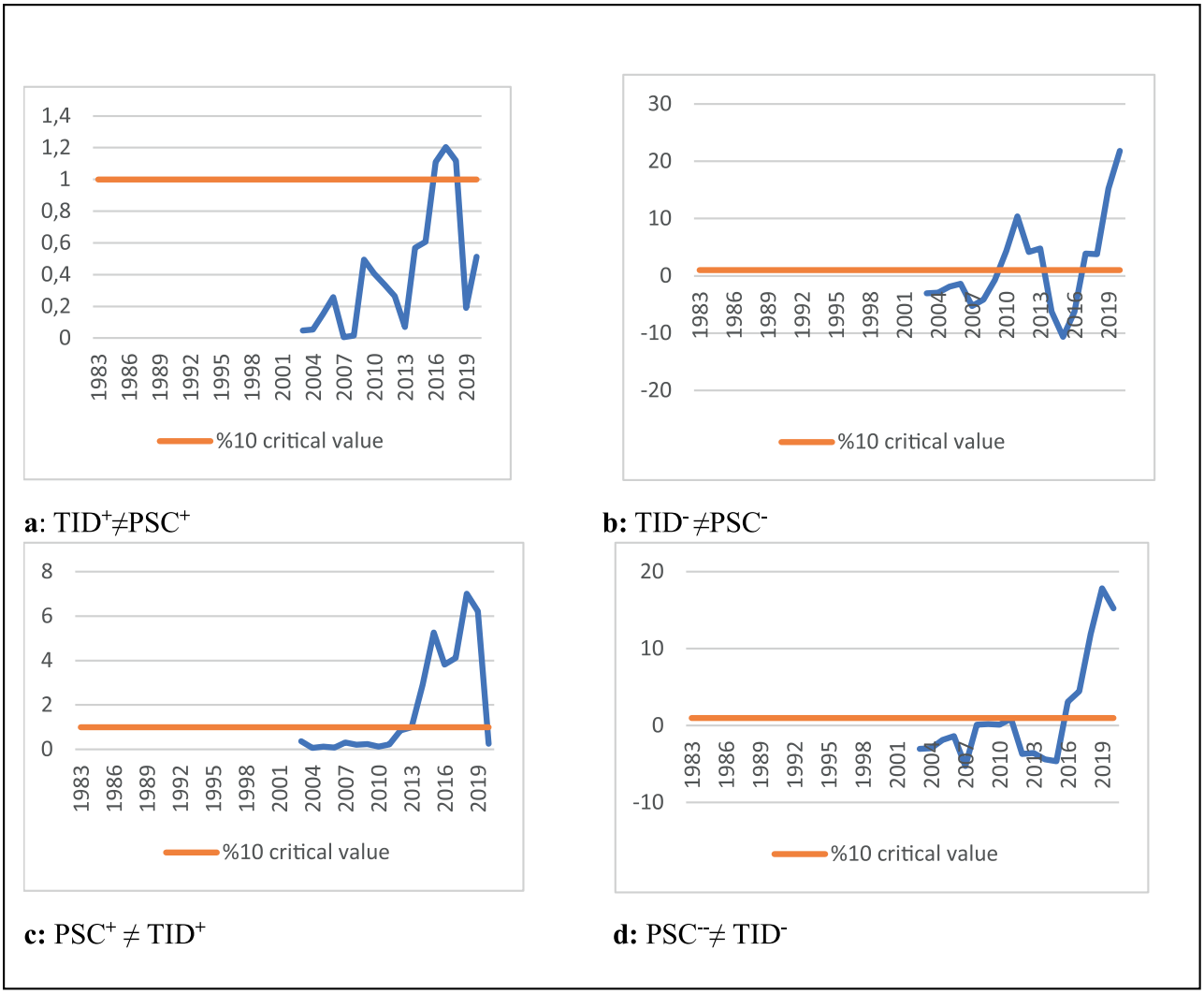
d: $BRM^{-} \neq TID^{-}$

Figures 1 (a), Figure 1(b), Figure 1(c), and Figure 1(d) confirm this result for a significant part of the time interval, but for positive shocks and negative shocks, it is the financial statements that result from social and political events at home and abroad. It seems that it emerged during the periods of turmoil (2015, 2018) and this causality relationship only emerged in a certain period.

Table 2 shows that there is an asymmetric causal relationship between total insurance density (TID) and private sector credit (PSC) towards positive shocks and negative shocks in the same direction. Figure 2(a), Figure 2(b), Figure 2(c), and Figure 2(d) confirm this result for a significant part of the time interval, but for positive shocks and negative shocks, it is the financial statements that result

from social and political events at home and abroad. It seems that it emerged during the periods of turmoil (2015, 2018) and this causality relationship only emerged in a certain period.

Figure 2:
Time-Varying Asymmetric Causal Relationship between TID and PSC variables



a: $TID^{+} \neq PSC^{+}$

b: $TID^{-} \neq PSC^{-}$

c: $PSC^{+} \neq TID^{+}$

d: $PSC^{--} \neq TID^{-}$

4. RESULT AND DISCUSSION

This article reviews the relationship between the insurance sector and the banking sector for the 1983-2020 period by using yearly data in the Turkish insurance sector and banking sector. In contrast to earlier studies in the literature, Hatemi-J's (2012) asymmetric causality test has been used as the research method because responses to positive and negative shocks may differ from one another and that test findings may shift over time. To investigate the causality among the variables in terms of sub-periods, the time-varying symmetric causality test, which was developed by Hacker and Hatemi-J (2006), was performed. According to the asymmetric Hatemi-j (2012) causality test, it was found that there exists a bidirectional causality between both positive and negative shocks of the total insurance density (TID), broad money supply- M2 (BRM) and private sector credit (PSC) variables. The bidirectional causality relationship between the banking industry and the insurance industry supports the feedback hypothesis, and Liu and Lee (2014), Pradhan et al. (2015), Lee and Liu (2016), and Liu & Zhang (2016) found similar results.

Asymmetric time-varying causality has been obtained as a result that causality changes depen-

ding on the time it originates from the 2015-2018 period when social, political, and financial events increased and broke out in Türkiye and abroad. The events that took place in this period affected the economy and increased the risk and therefore the uncertainty, respectively in summary; the Mining disaster in 2014, terrorist incidents, presidential and general elections, the 2015 Russia-Türkiye plane crisis, the 2016 coup attempt, terrorist incidents in the country, military operations abroad, the referendum in 2017, 2018 parliamentary and presidential elections, increasing inflation can be counted.

In the study, the total insurance density used for the insurance sector was used. In addition, time-varying causality test results, it has been shown that there is an asymmetric causality relationship between the data for only a short period and this causality relationship is not permanent. It shows that the insurance and banking system of Türkiye has not been affected much. It can be said that the underlying reason for the low impact of the crisis is that premium incomes are generally stable, investments are made in long-term funds rather than short-term funds, companies do their asset-liability management well, and they invest in traditional markets instead of investing in derivative products such as US insurance companies (Akpınar & Yıldız, 2018).

In future studies, the density of life and non-life insurance can be handled separately and its relationship with the banking sector can be examined. In addition, since the specified period is long, studies can be carried out with dummy or breaking tests, considering the crises experienced in Türkiye and in the world during this period.

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ORIGINAL ARTICLE

THE FACTORS INFLUENCING SOLVENCY RATIO OF INSURERS IN THE EUROPEAN COUNTRIES

Yusuf AKGÜL

Abstract
This paper analyzes the impacts of selected financial variables on the solvency values of 918 insurance companies from 36 European countries for the period 2017-2021. The solvency indicators used in this paper are the equity-to-assets ratio, debt-to-assets ratio, and debt-to-equity ratio, respectively, which are obtained from the balance sheets of the companies. As independent variables, return on assets, liquidity level, firm size, conservation ratio, and the COVID-19 pandemic are employed. Panel two-stage least squares (2SLS) regression analysis is utilized as a solution methodology. As a result of the analysis, a strong and negative association is found between company size and solvency values. Significant linkages are found between the other independent variables, such as return on assets, liquidity, and conservation rates, and the solvency variables. Moreover, it is observed that the COVID-19 epidemic has a negative effect on the solvency factors.

Keywords
Solvency, insurance, insurance level variables, COVID-19 pandemic, 2SLS

JEL Classification
G22, G32.

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1. INTRODUCTION

In developing countries, insurance companies, as well as banks, play critical roles both in establishing the stability of the financial system and in ensuring the sustainable development of countries (Çamlıbel, 2021; Işık, 2021).

Solvency is an important numeric factor that enables insurance companies or other financial companies to control their ability to continue their operations and fulfill their financial obligations in the long term. If insurance companies fail to meet their obligations in the long run, they face the risk of bankruptcy. The solvency factor also expresses the capital adequacy problem for insurance companies.

Araichi & Almulhim (2021) stated that consistency in the determination of solvency capital for insurance companies is a fundamental issue for actuaries and other stockholders. Insurance companies undertake downside risks while carrying out their activities. Additionally, they are known as companies that have the capital to pay their future debts while fulfilling their stated obligations to policyholders in return for the policies they sell.

Munari, Weber, & Wilhelmy (2021) explained that insurance companies and some financial companies operating in financial markets are subject to certain regulatory factors. In many financial regulations, the main purpose is to protect parties, such as depositors, policyholders, and other counterparties, against future financial problems. Corporate governance, reporting and transparency plans implemented by each company operating for commercial purposes are the cornerstones of its activities. However, capital regulation processes are equally important activities. Companies engaged in financial activities should define the minimum capital they should hold for future financial risks. Companies that fail in this competence are followed by authorized bodies and their activities can be taken under control when necessary. Financial companies are required to comply with solvency capital requirements, which define a minimum level for their current net asset value. Firms that do not meet these requirements are subject to audit interventions.

According to Liu et al. (2019), insurance solvency can be calculated according to premium volume-based standards in most insurance markets in the past years. Over time, it has become a transition from basic computing standards to risk-based standards. With these risk-based calculations, it reached a turning point in January 2016, and risk-based solvency regulations entered into force in the European Union (EU) and China. Therefore, the leading countries and regions of the insurance market, like the USA, EU1, and China, all have solvency regulations that are risk-based and have the basic standard of solvency capital requirements.

In this paper, the effects of some intra-company financial variables (i.e., profitability, liquidity, firm size, and conversation ratio) and the COVID-19 pandemic on the selected solvency variables of the insurance companies operating in the European insurance market are investigated. Literature related to the study subject is given, hypotheses for the regression equation are given, and some previous studies are given to support the hypotheses. Solvency values are obtained by proportioning the variables in the balance sheets of insurance companies. The values obtained as a result of the analysis are compared by looking at the previous studies. The values obtained from the study are interpreted financially in terms of insurance companies.

The contribution of this article to the literature can be summarized as follows.

- This study was performed on a large sample of 36 European countries.
- Data from 918 insurance companies operating in more than one insurance branch are employed for this study.
- In the study, the 2SLS estimator is utilized to solve the problem of endogeneity between the variables.
- This study is based on the most recent data (i.e., 2017-2021) from insurance companies.
- This study also controls for the impact of the COVID-19 pandemic crisis on solvency ratios.

2. LITERATURE REVIEW

There are various articles in the literature regarding the effect of solvency on insurance companies. The majority of these articles are about calculating solvency and examining the factors that affect it. Some recent studies on solvency are as follows.

Munroe et al. (2015) provide a precise statistical improvement of the risk metrics required to complement the Solvency II obligations for possible internal models for insurers' long-term liabilities and reserve risk. The suggested model is new, as it is not based on the proxy principle of proportionality. With the solution method based on the traceable simulation method, it provides sufficient capital needed to return the current economic balance sheet to the fair value of the debts in case of economic distress in the first following calendar year.

Alm, J. (2016) calculated the solvency capital requirement using the data obtained from the annual reports of the four major non-life insurance companies operating in Sweden. It aimed to find the marginal distributions of losses and the dependence between losses in the five largest business lines (LoBs) in order to build models for solvency capital requirement calculation. As a result of the study, they found that the dependency between the five largest business lines was weaker than assumed in the Solvency II standard formula. He also discussed under which conditions it would be better to use different formulas instead of standard formulas for the calculation of solvency capital by decision-makers in insurance companies.

Christiansen and Fahrenwaldt (2016) defined the underlying risk sources, solvency level, and time dynamics, which are thought to affect the solvency capital, which is an important determinant of life insurance contracts, using a back-and-forth solution system. They stated that by doing this, it would cause additional dissociation in total solvency according to different risk sources and times. It was stated that decomposition emerged as an intuitive tool for examining risk sensitivities. They studied forward-backward systems through linear partial differential equations and a Monte Carlo method based on Malliavin algebra.

Rubio-Misas and Fernández-Moreno (2017) examined the factors influencing the regulatory solvency ratio of Spanish insurance companies using the two-step system GMM model between 2005 and 2012. As a result of the study, it was seen that the use of reinsurance, premium growth, the form of stock insurers, and cost cap efficiency adversely affected the regulatory solvency ratio. Firm-level characteristics that affect the regulatory solvency ratio are stated to be strong in crisis and non-crisis periods. In addition, the effect of cost cap efficiency on the regulatory solvency ratio is greater for shareholders than for stocks.

Shao et al. (2017) performed a comprehensive evaluation including solvency capital requirements, premiums, and reserve variables were analyzed for the evaluation of long-term care insurance policies using daily living activities and US data. In the continuation of the study, independent policies, long-term care social insurance policies, life care salaries and shared long-term care insurance were compared in terms of net premium cost and solvency capital. By using Thiele's differential equation, which is the solution method, net premiums and the best estimated reserves are determined for basic long-term care insurance policies. It is shown how the costs and risks of long-term care insurance products are reduced with the determined maximum benefit period.

Coppola et al. (2018) stated that in the case of longevity risk, Solvency II's solvency capital requirements include distortions and inconsistencies resulting from the unchanged longevity shock compared to age and time assumed by the relevant regulatory model. To remedy this problem, they constructed a rotating window affine stochastic model, revealing the temporal nature of time-mortality included as the driver of the longevity shock. As a result of the study, it has been shown that the longevity shock can be eliminated, and the profile of the determined risk contractor can be reflected by allowing the required level of equity.

Nguyen & Vo (2020) investigated the association between the adoption of Enterprise Risk Management (ERM) and solvency for listed insurers in the European Union, according to the solution

results, controlling the endogeneity problem, it was stated that there was a decrease in the solvency levels of the insurers adopting ERM, and as a result of this situation, financial vulnerabilities could be triggered by the impact of unexpected shocks. Firm-specific variables such as leverage ratio, ROA, composite ratio and business type were found to significantly increase the solvency of EU-operated insurers, but the impact of firm size and age was found to be insignificant. According to the results obtained from the study, it is stated that insurers adopting ERM have common features such as higher performance, higher leverage, larger size and more diverse businesses. It has also been noted that market demand is an important factor in ERM adoption and insurance solvency.

Gatzert & Heidinger (2020) empirically analyzed market responses to initial solvency and financial position reports for all publicly traded insurance companies in the European Union, according to an English-language report based on a case study in their study. Regression analysis and text mining were used as methods and the key figures and textual attributes that were most important to investors were investigated. According to the results obtained from the study, it has been determined that the important figures mentioned in the solvency and financial status reports are more important than the textual features.

Moreno et al. (2020) analyzed the drivers that determine the solvency of insurance companies operating in the Spanish insurance sector. In the selected time period from 2008 to 2015, adverse events such as economic instability expressed by low or negative economic growth and record low interest rates occurred in the country. In their study using dynamic panel data resolution, a cross-type organization concluded that actual solvency margins were positively correlated with profitability and underwriting risk, but negatively correlated with reinsurance use, size, and longer term business and life insurance expertise. However, less concentrated markets and an economic crisis environment have been found to reduce solvency margins.

In their study, Ryu and Yu (2020) re-examined the determinants of hybrid bond issuances of insurance companies. In addition, the effects of issuers and issues that have an impact on financial solvency are analyzed. In the logistic regression analysis, it was seen that the probability of issuing bonds increases when the net income is higher, and the risk-based capital ratio is lower. At the end of the study, it was determined that the risk of bankruptcy decreased when the bonds were issued to foreign creditors.

Rödel et al. (2021) focused on financial guarantees in the life insurance products involved in their articles. In their study, they examined the two main types of interest rate guarantees offered as guarantees to customers in life insurance, the term guarantee and the stereotype guarantee. In order to obtain all probability distributions of forward solvency ratios, the model framework is limited to two sources of risk. In this way, the correct evaluation of the liabilities in the market and more consistent results in calculations are obtained. At the same time, thanks to the model used, the effect of different interest rate guarantees on future solvency can be analyzed in detail. As a result of the study, they stated that the type of interest guarantee has a significant effect on the solvency of the company in the long run.

Mukhtarov et al. (2022) examined the information content of the disclosures of solvency and earnings information of European insurance companies within the scope of Solvency I and Solvency II regulations. In their study, they used a sample of 571 data from 46 insurance companies in the period of 2012-2018. Within the scope of solvency, they found that although investors found the unexpected earnings informative, they did not find the unexpected solvency ratio. Unexpected earnings and solvency ratios, which are important for investors, are to be evaluated within the scope of Solvency II. Based on the variance decomposition method, it has been stated that within the scope of Solvency II, investor attention partially moves from earnings information to solvency information. In their conclusion, they found that the disclosed solvency ratios cover information about value within the risk-based Solvency II, and that the requirements under this framework direct investor attention to solvency data and distract from the earnings of European insurance companies.

Huggenberger & Albrecht (2022) reviewed the benefits of the risk pool created by stock insurance

companies for policyholders according to different standards of solvency. According to the result obtained using the second-order stochastic dominance method, they stated that if the equity is proportional to the premiums written, the benefit of the policyholders who do not like risk increases in proportion to the size of the pool. On the other hand, it is stated that an increase in pool size may reduce policyholders' own benefits if equity is calculated using the value-at-risk method. They have shown that if the constraint from excessive queue risk is covered by the pool, an infrastructure calculated by the value-at-risk will benefit risk-averse policyholders if there is augmentation of the pool with more risk. Through their work, they will contribute to the design of solvency standards and enable them to see the potential disadvantages of risk-based capital needs for policyholders.

Alokla et al. (2022) examined the drivers influencing the solvency of takaful insurance companies operating in Malaysian economies and members of the Gulf Cooperation Council and aimed to contribute to the literature. The main purpose of the study is to reveal a deeper understanding of the factors affecting the solvency of takaful firms. In the study, it was stated that the size of the firm and the attorney's fees caused a decrease in the solvency of 52 tekaful firms, as a result of the analysis made using the data between the periods of 2011-2016. As a result, it was stated that the attorney fee percentages should be followed. Some variables that are not related to solvency are specified. These variables are the return on assets, risk holding and investment income ratios as well as other explanatory variables. In the continuation of the analysis, it has been determined that there are significant differences between the takaful companies operating in Malaysia and the Gulf Cooperation Council member companies of the Gulf Cooperation countries. This situation is understood by the different stages of financial development.

González et al. (2022) investigated whether the degree of Enterprise Risk Management (ERM) implementation affects the performance of insurance companies under Solvency II. Based on the responses from the chief risk officers (i.e., CROs) of 44 insurance companies in Spain, one of the EU's largest insurance markets, they created a composite ERM index containing 76 variables. According to the results obtained, it has been seen that the higher the value is obtained according to the degree and quality obtained based on the ERM application, the better the return on equity and the return on assets adjusted for risk. On the other hand, it has been determined that the applied risk management performance standards are higher and more stable. It was also stated that the models created for Solvency II would penalize small companies and offset the costs associated with improvements in management.

Araichi & Almulhim (2021) aimed to create an appropriate model for the damage amounts by using the multivariate dependency factor between the risks. In order to do this, the hanging copula method was employed to capture the interdependence of the multivariate risk distributions including the five business lines. If the dependency structure is uncertain, this leads to different levels of capital. In cases of uncertain dependency structures, fuzzy solution methods are suggested. Based on the findings obtained from the study, a high solvency capital requirement arises according to the independence status if the multivariate dependency structure is considered. In addition, the Solvency Capital Requirement level is decided according to the degree of dependency between the risks.

When the above-mentioned literature is examined, the following gaps in the previous literature have been identified.

- It has been observed that there are a limited number of studies covering all European countries on solvency for insurance companies.
- The number of studies covering all insurance companies operating in all insurance branches in European countries is limited.
- The number of studies using the 2SLS method is not sufficient to solve the problem of endogeneity between variables related to the study subject.
- Previous studies did not consider the impact of the COVID-19 pandemic on the solvency ratio.

3. OVERVIEW OF THE EUROPEAN INSURANCE INDUSTRY

When we look at the sector report of the European insurance sector for 2021 prepared by the European Insurance and Occupational Pension Agency, the following information has been obtained.[1]

3.1. Life Business Sector

Looking at the countries operating in the field of life insurance, an increase is observed in the total gross written premiums. At the line-of-business level, index- and unit-linked businesses saw the highest increase. Life businesses decreased by more than 15% in both Liechtenstein and Slovakia.

On the concentration indicator, which is the measure of the market share of gross written premiums on a national basis, and is expressed as the 3, 5 and 10 largest premium writers, it is seen that Estonia, Iceland, Lithuania, Latvia and Malta have 3 undertaking concentrations over 80%. And it has been observed that the least concentrated market is Germany, in particular, Ireland, Italy, Spain and France.

According to the aggregate gross written premiums and the variation by country, an increase in Gross Written Premium is observed for the vast majority of countries. The largest percentage increases are seen in Norway and Portugal. The distribution of the change in gross written premiums for each country, Portugal has the highest median growth rate, followed by Liechtenstein.

However, the Czech Republic and Slovenia have a median growth rate of 0% or below 0%. In the reinsurance activities for each business line operating in the insurance sector, it is seen that the most reinsurance is made in the non-life insurance sector in annuities. The health insurance sector and the index and unit-linked insurance areas follow respectively. In terms of the gross written premium per capita, Luxembourg has by far the largest gross written premium per capita, followed by Liechtenstein and then Ireland. Here, the lowest value is found in Bulgaria and followed by Romania.

3.2. Non-Life Business Sector

In the non-life insurance sector, an increase in total gross written premium is observed in 2021 for most of the countries. Maritime, aviation and transportation are the business lines with the highest increase in reinsurance activities. In only 2 countries, the median combined rate of 100% or higher is observed for France and Romania. Credit and suretyship are the most frequently recurring business lines.

Looking at the concentration in the non-life sector, Latvia and Lithuania have 3 undertaking concentrations of over 90%. France has the least concentration market, followed by Germany, Spain and Cyprus. At the aggregate gross written premiums and the variation by country, for the vast majority of countries, growth in gross written premium is observed in 2021. In 2021, only the Slovak and Swedish non-life insurance markets contracted in gross written premiums.

Poland had the second-highest median growth, at 12%, while Romania had the highest median growth, at 13%, according to the distribution of the change in gross written premiums for each nation. The lowest growth seen at the median level is realized in Cyprus and Greece with 2%. The combined ratio per country, shows that the highest Combined ratio at Median level is found in Romania with 106%, while Malta has the lowest rate with 73%.

According to the claims ratio per country, the countries with the highest median claims ratio are France and Iceland with 74%. Malta has the lowest median rate of 34%. According to the expense ratio per country, the country with the highest median expense ratio is Romania with 57%. At the lowest median level, Luxembourg had 13%.

[1] file:///Users/pcya/Downloads/European-Insurance-Overview-Report-EIOPA-2022.html

3.3. Solvency and Capitalization

When we look at the country distributions, it has been observed that the median solvency capital ratio coverage values for all countries in Europe are over 150%. It has also been observed that the median minimum capital ratio coverage values are over 250%. For equities, it has been stated that at least 80% Tier 1 unlimited equity should be included, valid in each country.

Considering the distribution ratio of solvency capital by type of commitment, the median value ratio of all commitment ratios is 210% and the 25th percentile is over 160%. Looking at the solvency capital ratio by country, Germany has the highest solvency capital ratio with a median value of 293% and a lower quarter of over 206%. Iceland has the lowest median ratio at 156%. Finland has the highest median minimum capital ratio coverage at 877%. Romania is the only country with a median value less than 300%.

4. METHODOLOGY

The methodology section consists of data, variables, and hypothesis development sub-sections.

4.1. Data

The dependent and independent variables used in the analysis are obtained from the financial statements of the companies. The data of 918 companies operating in the insurance sector from 36 European countries between 2017 and 2021 is used in the study. These data were obtained from the Refinitiv Eikon.

4.2. Variables

Four insurance-specific independent variables like return on assets, liquidity, firm size, and conservation ratio are employed as independent variables. As dependent variables, three alternative solvency ratios are taken into account. In addition, the COVID-19 epidemic, which also influences the insurance industry, is added to the regression model as a dummy variable to control for the impact of this crisis. The expected sign of coefficients of variables such as conservation ratio and COVID-19 should be negative. The variables utilized for this study are demonstrated in Table 1.

Total Debt to Total Assets Ratio

Ilham (2019) expressed the variable known as the Debt-Asset Ratio or debt ratio is the solvency ratio used to measure the proportion of a company's debt-financed assets rather than its own use of equity.

The debt ratio is a unit of measure that compares all a company's financial liabilities with its total assets, specifically used to measure the company's risk of default or bankruptcy in the future. If at any time the operations of the company are stopped and it goes bankrupt, companies whose assets total more than their debts can meet their financial obligations. In other words, the less debt the company has, the more likely it is to continue its activities and fulfill its obligations.[2]

Rahman (2017) when the debt-to-assets ratio rises, this will lead to an increase in the financing costs of companies. Otherwise, there is a risk that companies with debts more than their assets will not be able to fulfill their financial obligations. Debt-Asset ratio takes values <1, =1 and >1. The value that investors and company managers want is that the debt ratio is less than <1.

[2] https://www.wallstreetprep.com/knowledge/debt-ratio/

Equity Ratio (Total Equity to Total Assets Ratio)

The equity-to-asset ratio is the ratio that indicates what percentage of a company's assets are owned by investors or shareholders. This ratio also determines how much of the company's assets are unleveraged and can come under the control of debtors in the event of bankruptcy.

The higher the value of the equity-to-asset ratio, the less leverage the company uses. A lower leverage ratio means that a greater proportion of the company's assets belong to the company and its shareholders. While the general consensus is that an equity-to-asset ratio of 100% is ideal, a lower equity-to-asset ratio does not mean that the situation is bad for companies.[3]

Total Debt to Equity

Efendi (2019) implied that the debt-to-equity ratio is the solvency ratio used by most companies to understand how much of the debt-financed capital companies use. Sawir (2014) explained that the debt-equity ratio is the solvency capital ratio, which reveals the debt and equity ratio at the stage of meeting the institutional need for funds and shows the company's ability to meet its obligations above its own capital. The higher this ratio, the more efficient the company is to pay interest and the higher the chance of getting a loan.

Table 1.
Variables Definitions

Variable	Measure	Notation	Expected sign
Dependent variables			
Solvency ratio_1	The ratio of total debts to total assets	DA	
Solvency ratio_2	The ratio of total equity to total assets	EA	
Solvency ratio_3	The ratio of total debt to equity	DE	
Independent variables			
Return on assets	Net profit/total assets	ROA	+/-
Liquidity level	Cash & cash equivalents/total assets	LIQ	+/-
Firm size	Natural logarithm of total assets	Ln_ta	+/-
Conservation ratio	Net premiums earned to net premiums written	CON	-
Covid-19 crisis	It takes the value 1 in 2020 and 2021, 0 in other years.	COVID-19	-

4.2.1 Hypotheses Development

In accordance with the purpose of the study, the following hypotheses have been produced when the theoretical and practical studies performed in the past are investigated.

For the ROA-solvency ratio association:

The high ROA ratio, the more profit the firm will earn. Companies that make a profit may want to borrow more money. If it borrows more, its solvency risk increases and a positive relationship between ROA and solvency is expected. If firms utilize their profits for investment, since profits will increase even more, the risk of solvency will decrease and there will be a negative relationship between ROA and solvency. Therefore, there could be a positive and negative relationship between ROA and solvency. Weihan (2022) found a significant and positive relationship between the ratio of debts to equity and the size of the company. In addition, a significant and negative relationship was found between the ratio of debts to equity and ROA. Baloch et al. (2015) found a significant and negative

[3] file:///Users/pcya/Downloads/European-Insurance-Overview-Report-EIOPA-2022.html

relationship between the ratio of debts to assets and the size of the firm.

For the liquidity-solvency ratio association

Firms with increased liquidity have higher credibility as their reputation in the market will increase. Thus, companies can borrow more money. If firms are more indebted, their solvency values increase, and if solvency increases, a positive relationship between solvency and liquidity is expected. On the other hand, companies with high liquidity hold money for speculation and tend to invest in different areas. In this case, the solvency decreases and a negative association between the solvency and the liquidity could be expected. Hence, there can be a positive and inverse linkage between liquidity and solvency. Consequently, Novokmet & Marinović (2016) found a negative result between solvency and liquidity in one model and a positive result between solvency and liquidity in the other model.

For the firm size-solvency ratio association

As companies grow, they specialize in what they do, and as a result, they reduce their costs in their operations. In this case, their profits increase, and then their solvency ratios decrease. In this case a negative relationship between firm size and solvency ratio is expected. On the other hand, as firms grow, bureaucracy increases within the firm and increasing bureaucracy costs subsequently increase borrowing. In this case, solvency increases and a positive relationship between solvency and firm size could be expected. That is, there can be a negative or positive link between firm size and the solvency ratio. Ahmed (2021) found a significant positive connection between the ratio of solvency and the size of the company. Yeo (2016), using the FGLS regression method, found a significant negative relationship with company size.

For the conservation-solvency ratio association

Theoretically, it could be expected that there is a negative relationship between the conservation rate and solvency.

For the COVID-19 pandemic-solvency ratio association

Theoretically, the COVID-19 pandemic-solvency ratio association is expected to be negative.

4.3. Models

In this part of the study, panel data regression model employed in the study is explained. In addition, the literature on previous studies using this model is included. The strengths and weaknesses of the model are mentioned below.

4.3.1. Two-stage least square

The OLS method, which is used in most statistical studies, produces inconsistent and biased results for the parameters of the regression model since it does not take into account the cross-section units and the time effects. It also does not take into account the issue of endogeneity regarding the variables. Endogeneity is one of the most critical issues to be considered in corporate finance studies. Thus, in order to overcome the endogeneity problem, it is observed that the 2SLS estimator is employed in lots of prior studies in the literature. In addition, Baranoff and Sager (2002) conducted a study dealing with the fact that the autoregressive 2SLS method provides a correction for autocorrelation in simultaneous equations through instrumental variables. According to Abrevaya, Hausman, Khan (2010)

when the endogeneity problem is not corrected in econometric models, it leads to prediction errors. When the model is formed correctly, the two-stage least squares method (2SLS) makes consistent estimations for linear models without the need to make parametric assumptions for error distortions. However, the 2SLS model is not suitable to be used in nonlinear models because it cannot be predicted consistently. As said by Hu and Yu (2014); and Cummins and Sommer (1996), the traditional 2SLS method is a regression estimator that can be used to reduce the endogeneity problem and to make consistent estimations. Land, Deane (1992) explained that the 2SLS regression method is more effective than the maximum likelihood method in terms of estimation and calculation, and numerical estimates are obtained in terms of statistical efficiency. According to Oczkowski and Farrell (1998), it can be said that the higher the correlation between the scale variables and the tools, the more efficient the estimator is asymptotically. Wooldridge (1997) said that the asymptotic normality and consistency of the 2SLS estimator yield useful results when the unknown form of the variance matrix is adjusted for its heteroskedasticity. The 2SLS method is preferred because of its strong standard errors and simplicity.

The models used for this study is as follows.

$$\text{Model-1: } (\text{DA})_{\text{it}} = \alpha_0 + + \sum_{j=1}^{4} (\text{ISFV})_{\text{it}}\, \beta_{\text{j}} + COVID - 19_t + \varepsilon_{\text{it}} \quad (1)$$

$$\text{Model-2: } (\text{EA})_{\text{it}} = \alpha_0 + + \sum_{j=1}^{4} (\text{ISFV})_{\text{it}}\, \beta_{\text{j}} + COVID - 19_t + \varepsilon_{\text{it}} \quad (2)$$

$$\text{Model-3: } (\text{DE})_{\text{it}} = \alpha_0 + + \sum_{j=1}^{4} (\text{ISFV})_{\text{it}}\, \beta_{\text{j}} + COVID - 19_t + \varepsilon_{\text{it}} \quad (3)$$

Where DA is the debt-to-asset ratio of insurer in year t, EA is the equity-to-total-assets ratio of insurer in year t, and ED is the equity-to-debt ratio of insurer in year t; α_0 and β_{j} are coefficients to be estimated. ISVF is a set of insurance specific financial variables. COVID-19 is a dummy variable that take value of 1 for the years 2019-2021, and ε_{it} is error term of the model.

Looking at Table 2, The deviation of the standard deviations from the mean in terms of solvency variables indicates that there are significant differences between insurers.

Table 2.
Summary Statistics

	Mean	Std. Dev.	Min	Max	N
EA	.07	.176	-.972	.975	3400
DA	.006	.032	.0001	.891	3145
DE	305.929	23526.664	-25603.223	1855083	3529
ROA	-.008	.277	-9.218	16.301	5227
LIQ	.06	.084	.0102	.994	5227
Ln_ta	16.552	2.837	8.311	27.762	4875
CON	.954	3.916	-168.85	188.1	4774
COVID-19	.346	.476	0	1	5227

When the correlation matrix in Table 3 is examined, it is observed that the correlation coefficients calculated for the independent variable pairs are below 0.42, indicating that multi-collinearity is not a significant problem for the regression models.

Table 3.
Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) EA	1.000							
(2) DA	-0.029	1.000						
(3) DE	0.474	-0.007	1.000					
(4) ROA	0.411	-0.007	0.153	1.000				
(5) LIQ	0.229	-0.254	0.070	0.095	1.000			
(6) Ln_ta	0.458	0.035	0.294	0.254	0.039	1.000		
(7) CON	-0.063	-0.207	-0.002	-0.135	0.022	-0.040	1.000	
(8)COVID-19	0.073	-0.322	0.043	0.195	0.039	0.080	0.117	1.000

4.3.2. Estimation Results

When we look at Model-I in Table 4, there is a significant relationship between lagged EA, DA, and DE, and dependent variables, which shows that past solvency variables are a significant determinant of current solvency variables.

From Table 4, ROA, liquidity, firm size, and conservation variables are significant determinants of the EA variable.

From Table 4, it is determined that the effects of the dummy variable measuring pandemic crisis and firm size on the DA variable are negative and significant. In their studies, Muhammad and Shah (2014) found a strong and negative relationship between the DA and ROA. Ahmed (2021) found a significant and positive relationship between firm size and DA. He also found a significant negative relationship between the DA variable and ROA. Yeo (2016) found no significant relationships between DA and firm size and found a negative relationship between DA and ROA according to the generalized linear model result. But, according to the results obtained from the cross-sectional time series FGLS regression model, there are significant negative relationships between DA and firm size and ROA.

Looking at Table 4, ROA, liquidity, firm size, and conservation variables are significant determinants of the DE variable. These findings reveal that the determinants of the DE model are similar to those of EA model. Muhammad, Shah (2014) found a negative relationship between DE and ROA and Fitrianti et al. (2021) found there was a significant and negative relationship between DE and ROA. Molla (2019) found a significant and negative relationship between DE and ROA. Ahmed (2021) found a significant positive relationship between DE and Ln_ta. Also, Yeo (2016) found a significant and negative relationship between the DE ratio and ROA.

Table 4.
Estimated Results of the 2SLS

	(1) Equity-to-Assets	(2) Debt-to-Assets	(3) Debt-to-Equity
L.EA	0.980***		
	(0.00771)		
L.DA		0.921***	
		(0.0124)	
L.DE			-0.0000651***
			(0.0000132)
ROA	-0.154**	-0.000786	27.40**
	(0.0659)	(0.000474)	(8.166)
LIQ	0.0329***	-0.00173	-76.67*
	(0.0112)	(0.000924)	(35.81)
Ln_ta	-0.000798**	-0.000638**	-5.310**
	(0.000316)	(0.000174)	(1.577)
CON	-0.00223***	0.00000500	0.793**
	(0.000461)	(0.0000184)	(0.265)
COVID-19	-0.00201	-0.00197**	-16.49
	(0.00180)	(0.000540)	(12.01)
Constant	0.0261***	-0.00882*	-65.33*
	(0.00542)	(0.00334)	(28.87)
Number of Observation	3399	4776	4776
Number of Firms	918	918	918
F-test	203.19***	163.37***	187.09***

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Conclusion

Solvency is an important performance indicator that is controlled especially for insurance companies to continue their activities. Solvency is not a single ratio but is also achieved using multiple balance sheet and income statement variables. Solvency is expressed as the ability to meet obligations in the long run. Insurance companies have to reach the numerical values where the solvency ratios are required.

When the results obtained from this study are examined, it is seen that the most effective variable on solvency is the size of the company (Ln_ta). This variable shows whether the insurers benefit from the advantages arising from economies of scale in the market in which they operate. If insurers benefit from economies of scale, a negative relationship can be expected between firm size and solvency. As seen Table 4, there exist a significant and negative relationship between solvency and Ln_ta, which indicates that insurance companies benefit from economies of scale. In other words, as insurers grow in terms of total assets, the solvency ratio they hold tends to decrease.

At the same time, ROA, LIQ and CON variables, which are other critical variables for the solvency of insurers. According to the results of this study, the policy recommendations of the study are as follows. Considering the significant effects of financial variables on solvency, it indicates that managers should consider these variables in order to control the solvency.

For future studies, other solution methods that prioritize endogeneity can be used, for example, the system and difference GMM methods. In addition to the financial ratios used in the study, different performance variables can be used. The sample used in the study can be expanded. The time period in which the data is used can be chosen wider.

As for the limitations of the study:

• The subject of study covers only European countries. It is not binding for insurance companies operating in other countries.

• The time interval subject to analysis is narrow.

• In the study, only one solution method which deals with endogeneity is used.

• Since the study deals with insurance branches operating in more than one field, comments cannot be made for a single insurance field.

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