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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.

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

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

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

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

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

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.

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

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

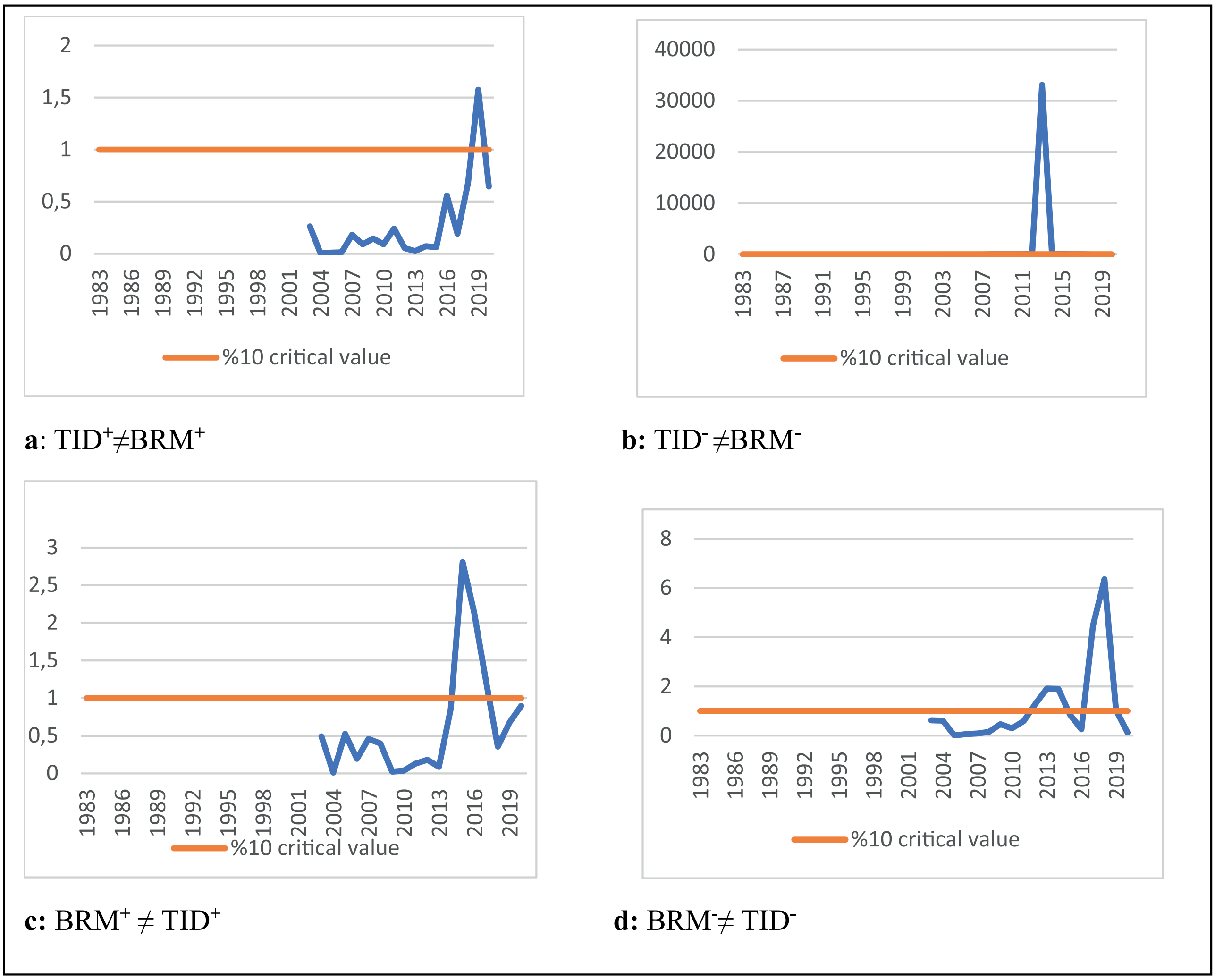
Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

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

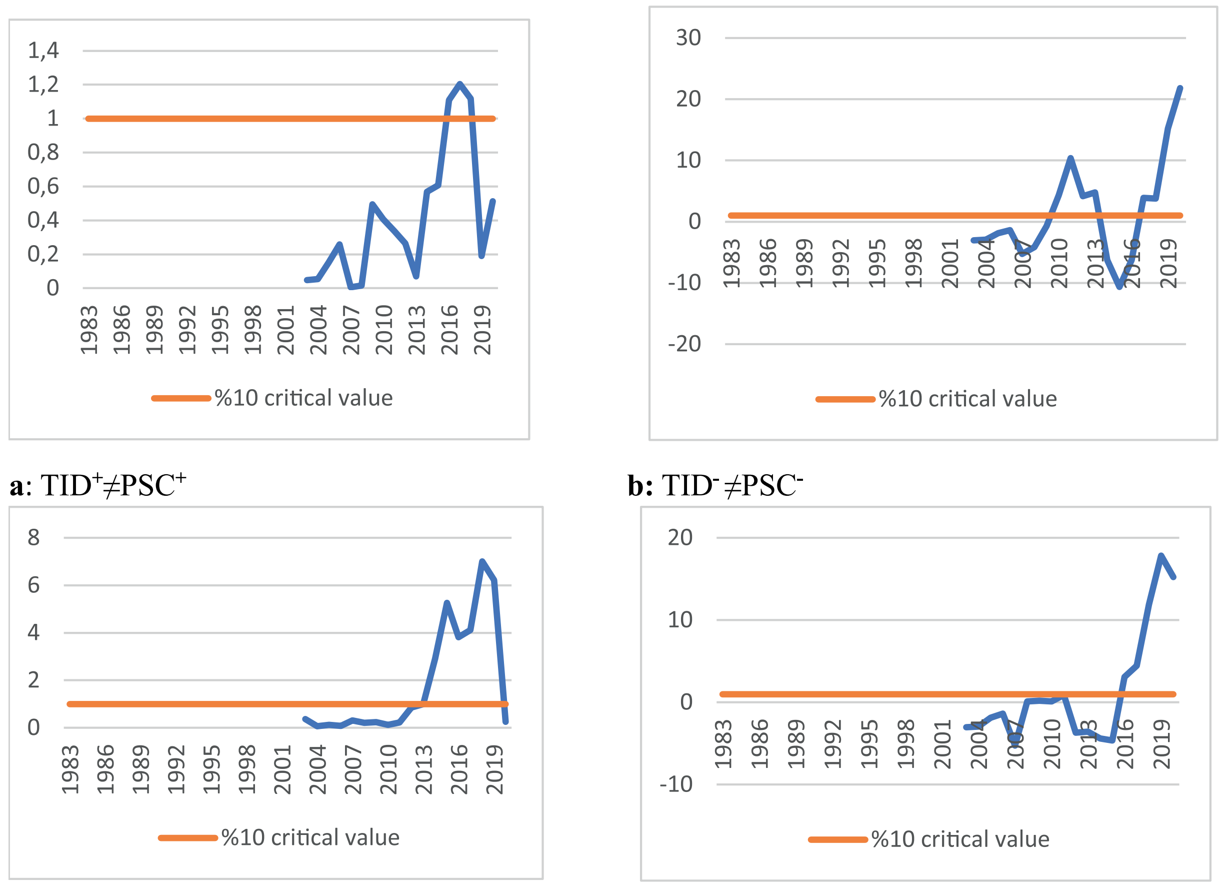
c: $BRM^{+} \neq TID^{+}$ **d:** $BRM^{-} \neq TID^{-}$

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 depending 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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