IS MINSKY'S INSTABILITY HYPOTHESIS ACCEPTABLE FOR THE RELATION BETWEEN BORROWING RATE AND PROFITABILITY?[1]

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Abstract

As in the financial crisis of 2008, overindebtedness of the economic units leads to an instability. In the Financial Instability Hypothesis, Hyman Minsky, who supports this opinion, points out that borrowing in capitalist systems causes instability. In this study, the validity of Minsky's hypothesis was examined in a micro-based way with reference to the relation between the profitability and borrowing rates of the firms. Therefore, it was aimed to research the relations between the debt structure and the profitability of the firms considering the sectors within the context of Istanbul Stock Exchange (BIST) Market manufacturing industry. In the study, the variables such as return on assets, return on equity, net profit margin, leverage ratio, short term debt ratio, current ratio, average collection period, inventory cycle time, economic instability and financial instability were examined. And also, the annual data over the period of 1994-2010 for the 15 firms which are in metal manufacturing industry in BIST were used. In the study, the relation between economic instability and financial instability was examined by the Westerlund cointegration test while the existence of causal relation was examined by the Holtz-Eakin Panel causality test. As a result, it was concluded that any long term relation and any relation of causality do not exist between the relevant variables.

Keywords: Instability, Westerlund Cointegration, Panel Causality Analysis, Profits and Debts for Firms.

JEL Classification: C33, G10, L6

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1. Introduction

The acts of economic agents have an undeniable effect on economic systems. Particularly, the decisions of economic agents about investment and saving dominate over markets and matters to realize the projected policies. The trends of saving and investment of economic units depend on conditions of financial markets. For example, when savings and investments in an environment which promotes a positive situation observed overall economy, many volatilities occur in financial markets, or uncertainties can cause an economic instability in economy.

Minsky (1985) tried to explain the concept of financial instability, which he defined as the extreme volatility in capital and asset prices, through "The Financial Instability Hypothesis" by emphasizing that economic stability leads to financial instability, and financial instability leads to economic instability, as well.

Minsky's Financial Instability Hypothesis explains cyclical fluctuation in economies with the concept of financial vulnerability. According to this hypothesis, investments and impaired relations between financial structures of investments during cyclical fluctuations explain the financial vulnerability. Investors tend to invest by borrowing with the effects of positive expectations in advanced economies having deepening financial markets. Therefore, investments rise and economy expands. This, also, causes increase in debts in private sector. In addition, the increase in inefficient debts causes impairment of finance market rising financial instability. Thus, an instable structure in economy arises. According to Minsky, there is a relation between borrowing and financial structures of firms.

In this study it was aimed to analyze the relation between the economic and financial instability suggested by Minsky. The 15 firms in the metal manufacturing industry between the years of 1994- 2010 were examined. This study has three objectives. The first one is to research whether there is a long-term relation between economic instability and financial instability. And the second one is to examine a possible relation of causality between economic instability and financial instability. As for the third one, it is to research the causal relation between the profitability and borrowing rates of the firms.

2. Theoretical Framework and Literature Review

In his financial instability hypothesis, Hyman Minsky, a post-Keynesian economist, researched the case in which the relation between the profitability and the debt affects economy. Minsky developed his hypothesis by using the General Theory of Keynes, by augmenting the Debt-Deflation Theory of Fisher under the influence of Marx's views on the dual price level analysis and of Kalecky's views on the increasing risk principle with budget deflation approach by integrating the Levy's views on profit.

"Minsky's Financial Instability Hypothesis is an alternative to the neo-classical synthesis, i.e., today's standard economic theory. It is designed to explain instability as a result of the normal functioning of a capitalist economy." (Minsky, 1982, p.92).

Minsky's Financial Instability Hypothesis is an endogenous theory. According to Minsky, the capitalist system has a naturally instable structure and a tendency to produce an instable situation even if there are no interventions to economy (Minsky, 1986, p. 325).

The most important financial powers of a capitalist economy are collected by financing investments and positions, and in such a type of economy, investment decisions, investment financing, investment activation are related to profits together with the commitments given for outstanding debts. Accordingly, the performance of a capitalist economy depends on the up-to-date success of the borrowers in terms of paying the commitments, and the abilities of today's credit indebtedness to pay it back (Minsky,1980, p. 212).

According to Minsky, financial instability can be explained by the existence of financial intermediaries, fluctuations in the price of financial existences and profit opportunities created by financial price fluctuations. Therefore, unproductive debts of the economic agents having more profit motivation and activist policies of monetary administration cause financial system to be more fragile. In addition, there is a relation between the finance of the investment and the price of the capital goods. According to Minsky, investors who use profit opportunities tend to invest by debts even if they do not have a capital. A typical firm uses its own capital or gets into debt in order to finance its investment. In case of borrowing for investment, both creditors and debtors have risks. The risk of the debtor is not to pay it back, and the risk of the creditor is not to be able to get the credit

from the debtor. In Minsky's investment theory, the existence of these risks affects the demand and supply of the investment negatively. However, the optimistic climate created by profit opportunities in economy decreases the possible effects of the current risk and motivates the investors to make more investment by getting into debt (Ergül, 2005, p. 137).

In the literature, there are quite a few studies on financial instability on the basis of Minsky's hypothesis. In one of those studies, for instance, Barrell, Davis and Pomerantz (2006) examined the effects of banking and monetary crises on the consumption in the OECD Countries for the period of 1970-2002. In the study, the reaction of the consumption on financial instability was examined with the Panel Data Analysis. Total consumption, real net financial wealth, and real personal disposable income variables were used in the model. As a result, it was found that consumption had a negative effect on financial instability, and it had a positive effect on real net financial wealth and on real personal disposable income. Therefore, it was concluded that consumption played an important role in relieving the effects of the financial crises. Moreover, the effect of crises was higher in case of high and rising leverage situation.

Matsumoto (2007) stated that the Indonesian economy had the same process after 1990. The economic growth of Indonesia depending on the increase of foreign debt sustaining with sources of offshore banking worsened financial positions of the companies and the financial system gradually became instable before the Southeast Asia Crisis. Oosterloo, Haan and Jong-A-Pin (2007) examined the factors which affected the financial instability in 154 countries for the 1996-2005 period with the Panel Probit Method. For this purpose, GDP per capita, systematic banking crises and the EU membership variables were used in the study. It was found out that the income per capita, systematic banking crises and the EU membership increased the financial stability. Xafa (2007) conducted another study and examined the global imbalances and financial stability. It was found in the study that there were two viewpoints about the global imbalances. According to the traditional viewpoint, the imbalances are considered as a threat to the global economic and financial stability. And according to the new paradigm viewpoint, in order to be protected from the sharp increases in interest rates in the USA, imbalances are considered as a natural result of the economic and financial globalization. In terms of political applications, the traditional

viewpoint focuses on the sudden resolution of the imbalances which include the sell-out of the dollar-denominated assets, and the monetary and financial policy decisions must be converted into reverse as soon as possible. On the contrary, the new paradigm suggests that the imbalances occur via the normal functioning of the markets. In the study, the idea of that the imbalances were not possible to be resolved was discussed, and some arguments were developed in order to support the viewpoint of the new paradigm.

Graeve, Kick and Koetter (2008) conducted a study to examine the relation between the monetary policy and financial stability level in Germany for the period of 1995-2004 by using micro and macro approaches. The financial instability was measured as distress at bank level in the study. Thus, the data on the German economy and banking system were used in the study. The Hazard Rate Model was used to measure the financial stability at bank level; and the VAR model was used for the macro model. The CAMEL System variables were used at banking level. Also, the variables such as economic growth, inflation rate, and the interest rate were used for the macro model. As a result of the study, it was determined that the unexpected tight monetary policy increased the bank distress probability, and that the effect of the monetary policy on financial stability was bigger when the bank capitalization was lower.

Klompa and Haan (2009) examined the relation between the independency of the central banks and the financial instability in developed and developing countries for the period of 1980-2005 by using the Dynamic Data Analysis Method. Firstly, the variables which demonstrated the banking system were used in the study. Then, the variables which affected the financial instability were included. The financial instability indicators were subjected to Factor Analysis to form the financial instability variable. The rate of the bank liabilities to the assets, the rate of the bank reserves to assets, the rate of the capital to assets, domestic loans, the rate of the loans given to private sector to the GDP, the change in the real interest rate, the change in the bank discount interest rates, the change in the share price index, the change in the public security incomes, the rate of the M2 to GDP and the rate of the central bank assets to GDP were used as the financial instability indicators in the study. The variables like economic growth, currency, financial market liberalization, terms of trade, economic independence, political independence, and the price stability were also included in the model. As a result of the study, it

was found that there was a negative relation between the independency of the central bank and financial instability. It was determined that this negative relation stemmed from political independence rather than economic independence. In addition, it was also seen that the increase in the GDP decreased the financial instability; and the currency, financial market liberation and political instability variables increased the financial instability.

Noren (2009) conducted a study and examined the financial stability dynamics in the Euro region. In order to obtain full capacity in the study, it was stated that the long-term balance between the required growth and the financial stability formed the focal point of the economic policies belonging to the countries in the Euro Region. In his study, Noren suggested that the reforms that were performed to ensure flexibility in labor market were significant and necessary; however, they were not sufficient alone. In addition, it was also understood that short-term indicators which would create flexibility in economic policy had to be supported in order to balance the demand in the stable balance growth policy as well as to make the reforms in the labor market applicable. It was also determined that all of the factors mentioned above were essential to ensure the financial stability.

Silipo (2011) examined Minsky's Financial Instability Hypothesis from different viewpoints in a theoretical manner. The issues dealt with in the study are as follow: Economic units are more inclined to take risks during economic growth and economic recession. Banks are more eager to finance those who take loans. Over-indebtedness and financial innovations during the bursting period make the system become more fragile and leave it open to reverse effects. As a result, it was seen that these effects led to a debt crisis.

Keen (2013) conducted a study in 1995 and dealt with Minsky's Financial Instability Hypothesis Model and expanded it to produce a strict macroeconomic model which could produce monetary and real acts emerged by the big recession. This model reflected the extreme points rather than real economic situations because some real viewpoints were not included like the capital commodity price levels formed far from the ordinary commercial goods, the effect of the governmental expenditures ignored and the interest rates changed with the inflation rates.

Greenwood-Nimmo and Tarassow (2013) conducted a study and evaluated Minsky's Financial Instability Hypothesis in a macro-econometric manner, and tried to develop a small macroeconomic model that cared for the clear properties of the Minsky economy. Thus, they examined the real GDP, Tobin's *q* ratio, investments, federal fund rates, potential production amount, Consumer Price Index (CPI), real debt management costs, corporate domestic funds, and real gross corporate investments. After the Johansen cointegration, the VAR analysis and error correction model (VECM) analysis applications, it was concluded that there was a long-term relation between the variables. In addition, it was also determined that there was a significant relation between the cash inputs of the companies and their debt payment liabilities.

Mulligan (2013) tested Minsky's Financial Instability Hypothesis with various industrial groups registered in North America Industrial Classification System. The data of 8707 companies for the period of 2002-2009 were used in the study. Each of the companies was classified as hedge according to the *covering the interest ratio*, speculative and Ponzi finance units. The classification was made as follows: If the *covering the interest ratio* is equal to or bigger than 4, it is hedge finance unit. If it is between 4 and 0, it is speculative finance unit. And if it is less than 0, it is Ponzi finance unit. The validity of Minsky's hypothesis was handled in the context of hypothesis tests. As a result of the study, it was seen that Minsky's Hypothesis was valid for every sector except for the public and service sectors. Moreover, it was concluded that the interest rates were related to the market value and ratio of the speculative companies in various sectors. Therefore Minsky's Financial Instability Hypothesis was also related to the Austria Conjuncture Circuits Model.

Yagoubi and Mekki (2013) defined a dynamic model which handled the financial stability concept according to Minsky's Instability Hypothesis. The model used in the study was formed by being inspired by the stock-flow approach. Three sectors, which were the credit market, the goods and services market and the financial markets, were examined in the model. The study was based on the economic models that reflected the micro structural analysis. In addition, the financial dimension was also included in the macro dynamic models. As a result of the study, it was found that the balance sheet values of the financial institutions were affected by the short-term fluctuations. Also, the book value of the assets and liabilities was related to the ability of the

companies to pay their debts and financial stability. Besides, the interest rates had a considerable effect on the system instability.

Caverzasi (2014) tried to explain the mortgage crisis with the Minsky Financial Instability Hypothesis and Jan Toporowski's Capital Market Inflation Theory. Thus, the data on commercial and industrial debts and housing credits of the commercial banks were examined in the study. It was determined that the asset price inflation caused that the credits were available for the people who increased their debts and savings. It was also found that the capital asset inflation caused that the companies became less dependent on bank loans and increased their savings. This led banks to shift their commercial activities from companies to ordinary household people, and, therefore, led to the increase in their debts.

Korkmaz and Yamak (2015) conducted another study and examined the relation between economic instability and financial instability for the periods of 1987-2007 and 2008-2012 in Turkey by using the credit/income rate as the financial fragility index and by using the standard deviation of the real GNP for a 6-quarter period as the economic instability index under the VAR Approach. As a result of the study it was concluded that the financial fragility was the reason for the economic stability only for the period of 1998-2012 in the economy of Turkey.

Charles (2015) conducted a study and examined the validity of Minsky's Financial Instability Hypothesis through the simulation method. He emphasized the basic role of the shareholders on not distributing profit rates to the managers. The results pointed out that the instability hypothesis was generally valid. The decrease in the profit rates, that were not distributed, supported the results of Minsky, who emphasized the disrupting role of the shareholders in distributing the profits. Also, the periodical property of the debt rates depended on the fact that tells us that the net profits have to grow more slowly than the investments. It was also concluded that less interest rates or higher investment inclination encouraged the financial fragility.

Pirie and Chan (2016) examined the consistency of the investment decisions of institutional investors by using Minsky's Financial Instability Hypothesis. Thus, they performed face-to-face interviews with 25 investors in Hong Kong. As a result of the analysis, they found that the investors acted in consistency with Minsky's Financial Instability Hypothesis, which suggested that the markets were in a dilemma between stability and instability. Sanabria and

Garcia (2016) examined the validity of the Financial Instability Hypothesis in the economy of Spain for the period of 1994-2008. As a result of the study, it was concluded that the relation between the debts and economy bubbles strengthened the use of foreign finance, and decreased the leverage ratio in a slow pace. It was also found that there were fragile and speculative movements in the Spanish economy in the relevant period. Rozmainsky (2016) examined the changes in the monetary circulation in Russian economy for the period of 1991-1998 through the Post Keynesian Theory. In this study, the monetary changes were evaluated with the changes of the bank deposits with cash money, bartering and the unpaid debts. This relevant process is called as "monetary corruption". As a result of the study, it was found that the monetary corruption created additional obstacles in financial investments, and this, in return, led to cost-push inflation.

Minsky and many other studies in the literature discuss the theory in terms of macroeconomics. Thus, this study is attributed to a micro basis, which makes it distinct in the literature. In other words, the study discusses the Financial Instability Hypothesis on a micro basis with reference to the relation between the profitability and borrowing rates of firms. In this respect, it is considered to be distinctive.

3. Data and methodology

The data consist of 17 annual observations and 15 firms for the Metal Manufacturing Industry Companies in BIST between 1994 and 2010. The time dimension of the dataset handled in the study covers the years between 1994 and 2010. There are two significant reasons for choosing this period of time. The first one is that it includes the 1994 and 2008 global crises, which Turkey underwent. The second reason is that the aim of the study is to deal with the period until 2010 by considering that the effects of the global crises have continued until today. For this reason, this time period includes the two crises and the effects of the 2008 crisis. So-called firms are involved in pioneer firms of the manufacturing industry. Also, they were chosen as samples due to both being involved in ISO500 and BIST100 and being the firms of which data set can be obtained. The stock codes of the firms are shown in Table 1.

Table 1

Stock Codes

ALCAR	ARCLK	BFREN	BSHEV
DITAS	EGEEN	EMNIS	PARSN
FROTO	MUTLU	OTKAR	FMIZP
PRKAB	TOASO	TUDDF	

The firms' ratios of the debt and profitability variables are used. The manufacturing industry sector is one of the sectors which make great investments. The finance of the investments is supplied through debts rather than the core resources of the companies. In addition, it is considered that the debt inclination in the manufacturing industry sector affects the ongoing state of economy. This sector is the leading factor of a country. Thus, the profit and debt ratios of these companies were used in the study. The stability in sales revenues of a firm refers to its economic stability. Therefore, in the study, the standard deviation of the net sales revenues is considered as economic instability. Similarly, the solvency of a firm can indicate the stability of financial structures. The solvency of a firm depends on its sales revenue. Consequently, the deviation of the debts to sales revenue ratio is used as financial instability indicator due to showing financial instability of a firm. As it is already known, standard deviations are the indicators of a risk and show how much the results are far from the balance. In other words, a standard deviation may be defined as the indicator of the instability in economy. For this reason, the standard deviations of the relevant variables were used in the study.

It can be thought that just these variables are not enough to explain is not enough to explain that the financial structure of a firm. Therefore, the variable referred in Table 2 is also incorporated in the analysis. In the study, causality between profitability and borrowing was examined owing to the fact that it is suggested in Minsky's Financial Instability Hypothesis that there is a relation of causality between cash flow and cash outflow. Thus, the profitability as well as the borrowing rates related to firms was taken into consideration in the study. All the details regarding the variables are shown in Table 2.

Table 2

Variables

Variables	Description
ROA	Return On Assets = Net Profit / Total Asset
ROE	Return On Equity= Net Profit / Shareholder Equity
NPM	Net Profit Margin= Net Profit / Net Sales
LR	Leverage Ratio= Total Debt / Total Asset
STD	Short Term Debt Ratio= Short Term Debt / Total Debt
CR	Current Ratio= Current Asset / Short Term Debt
ACP	Average Collection Period= (365*Average Accounts Receivable) / Net Sales
ICT	Inventory Cycle Time=(365*Average Inventory) / Cost of Sales
EI[1]	Economic Instability = (Net Sales Profit) $_{standard\ deviation}$
FI[1]	Financial Instability=(Sales-Debt Ratio[2]) $_{standard\ deviation}$

Notes: 1) EI and FI variables have been composed by the recorder with reference to the theory; 2) Debt Ratio=(Long term liabilities-Short term liabilities)$_t$-(Long term liabilities- Short term liabilities)$_{t-1}$

Sources: Akgüç, 2011: 450-459; Karaca, 2014:193-208.; Botchkarev and Andru, 2011:246.

Panel data or longitudinal data typically refers to the data containing time series observations regarding a number of individuals. Therefore, observations in panel data involve at least two dimensions: a cross-sectional dimension indicated by subscript i and a time series dimension indicated by subscript (Hsiao, 2003:1). This study is used with the unbalanced panel data because some annual values are missing.

When it is analyzed through the time series or panel data, it is very significant for the variables to be stable. That is because, if the variables are instable, a spurious regression will be determined. Unit root tests are usually investigated as stable. The panel unit root tests are divided into two: first-generation tests and second-generation tests. The first-generation tests assume that there is a correlation between units. When the correlation is weak for this test, the first-generation unit root tests are used to examine it. The Pesaran CIPS test is the second-generation unit root test, and also the Pesaran CD test is used to examine cross sectional dependence. The Pesaran CD test is calculated in the following way: (Pesaran, 2004, p.5).

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{p}_{ij} \right) \qquad (1)$$

Fisher ADF panel unit root test developed by Maddala and Wu is a first generation unit root test. Fisher ADF panel unit root test in the data set is not required to have a balanced panel. Also, this test may have individual gaps.

"All these procedures depend on different ways of combining the observed significance levels (p-values) from the different tests. If the test statistics are continuous, the significance levels π_i ($i = 1,2,...,N$) are independent uniform (0,1) variables, and -2log$_e\pi_i$ has a χ^2 distribution with two degrees of freedom. Fisher ADF unit root test is calculated in the following way." (Maddala and Wu, 1999, p.636).

$$\lambda = -2 \sum_{i=1}^{N} log(\pi_i) \qquad (2)$$

π_i is the probability value of unit root test's for i cross-section in here.

After the levels/differences in which the series are fixed are determined, the relations between the relevant variables are examined.

There are two kinds of relationships between the variables: Long term and short term. The existence of a long term relationship is examined with the cointegration test while the existence of a short term relation is examined by the analysis of causality. One of the panel cointegration tests is Westerlund (2007) Panel Cointegration Test. Westerlund Panel Cointegration Test is used for the units in the case of the unequal length series. And also, this test examines the existence of long term relation for an unbalanced panel. The cointegration test is calculated in the following way:

$$\alpha_i(L)\Delta y_{it} = \delta_{1i} + \delta_{2i}t + \alpha_i(y_{it-1} - \beta_i' x_{it-1}) + \gamma_i(L)'v_{it} + e_{it} \qquad (3)$$

"In all three cases, note that the error correction model in (3) can only be stable if the variables it comprises are all stationary. Thus, as $y_{it-1} - \beta_i' x_{it-1}$ must be stationary, the vector β_i defines a long-run equilibrium relationship between x_{it} and y_{it}, provided of course that the errors v_{it} and e_{it} are also stationary. Any deviation

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from this equilibrium relationship lead to a correction by a proportion $-2 < \alpha_i \leq 0$, which is henceforth referred to as the error correction parameter. If $\alpha_i < 0$, then there is error correction, which implies that y_{it} and x_{it} are co-integrated, whereas if $\alpha_i = 0$, then the error correction will be absent and there is no co-integration. This suggests that the null hypothesis of no co-integration for cross-sectional unit it can be implemented as a test of $H_0: \alpha_i = 0$ versus $H_1: \alpha_i < 0$. In what follows, we shall propose four new panel statistics that are based on this idea."(Westerlund, 2007, p.711-712).

The causality analysis which is edited by Holtz-Eakin, Newey and Rosen (1988) are estimated by Two-Stage OLS. The Holtz-Eakin functioning of causality test is shown as follows;

"A model which is analogous to equation (4), but allows for individual effects and non-stationaries across time is f_i is an unobserved individual effect and the coefficients $\alpha_{0t}, \alpha_{1t}, \ldots, \alpha_{mt}, \delta_{1t}, \ldots, \delta_{mt}, \psi_t$ are the coefficients of the linear projection of y_{it} on a constant, past values of y_{it} and x_{it} and the individual effect f_i." (Holtz-Eakin, Newey and Rosen, 1988, p.1373).

$$y_{it} = \alpha_{0t} + \sum_{j=1}^{m} \alpha_{jt} y_{it-j} + \sum_{j=1}^{m} \delta_{jt} x_{it-j} + \psi_t f_i + u_{it} \text{ (i=1,...,N ; t=1,...,T)} \quad (4)$$

The model's difference should be taken to remove the fixed effects' indicator. In this case, differentiated final model is expressed in the following format:

$$y_{it} - y_{it-1} = \sum_{j=1}^{m} \alpha_j (y_{it-j} - y_{it-j-1}) + \sum_{j=1}^{m} \delta_j (x_{it-j} - x_{it-j-1}) + (u_{it} - u_{it-1}) \quad (5)$$

The Holtz-Eakin causality test examines whether the (5) equality contained in δ_j's is equal to zero as a group. And also, the null hypothesis is examined whether x causes y.

4. Results

In this study, it is aimed to display the long and short term relations between the economic and financial instability variables as well as the relation of causality between the profitability and borrowing rates, which have been determined. In order to obtain reliable data during the study, it is required to determine the level/differences at which the variables are stable. Firstly, for this aim, it is necessary to research whether there is a cross-section dependence.

Accordingly, in the study, the existence of a cross-section dependence was researched by means of the Pesaran (CD) Test. According to the results of the Pesaran (CD) Test, it was understood that there wasn't a cross-section dependence. Then, the series were examined with Fisher ADF test for stationary. The series are analyzed for the level value, and the results are shown in Table 3.

Table 3

Fisher ADF Unit Root Test For I(0)

Variables	*None*		*Individual Intercept*		*Individual Intercept and Trend*	
	Statistics	**Prob.**	**Statistics**	**Prob.**	**Statistics**	**Prob.**
ROA	-6.0365	0.0000***	-3.9309	0.0000***	-3.3667	0.0002***
ROE	-7.1875	0.0000***	-5.2522	0.0000***	-5.0760	0.0000***
NPM	-9.8421	0.0000***	-7.9818	0.0000***	-7.0147	0.0000***
CR	0.3407	0.6333	-0.4584	0.3233	0.2898	0.6140
LR	-0.3243	0.3728	-0.8102	0.2089	-1.5105	0.0651*
STD	0.5916	0.7230	-4.0107	0.0000***	-2.3995	0.0082***
ACP	-3.5439	0.0002***	-3.8957	0.0000***	-3.8183	0.0001***
ICT	-0.1939	0.4231	-5.1281	0.0000***	-5.0372	0.0000***
EK	-1.3217	0.0931*	-1.0850	0.1390	-1.6415	0.0503*
FI	-2.5223	0.0058***	-0.7060	0.2401	-0.8695	0.1923

Notes: Lag length is determined according to the Akaike information criterion. Maximum lags are determined 2. *, ** And ***, respectively, 0.10, 0.05 and 0.01 indicates the level of statistical significance.

With reference to Table 3, it can be said that return on assets (ROA), return on equity (ROE), net profit margin (NPM) and average collection period (ACP) are stationary at their level values. When the graphs of the economic and financial instability variables were looked into, it was seen that the results of the unit root test with the constant term were to be taken into consideration. Also, it was observed that another similar case was true for the leverage ratio (LR) and for the inventory cycle time (ICT). Within this context, it was concluded that ICT and STD were stationary at their level values. But it cannot be said that EI and FI were stable at their level values.

The variables, which are stationary, are analyzed by taking the first difference. The results are shown in Table 4.

<div align="right">**Table 4**</div>

Fisher ADF Unit Root Test For I(1)

Variables	None Statistics	None Prob.	Individual Intercept Statistics	Individual Intercept Prob.	Individual Intercept and Trend Statistics	Individual Intercept and Trend Prob.
CR	-10.1172	0.0000***	-6.4057	0.0000***	-6.8214	0.0000***
LR	-10.4695	0.0000***	-6.9713	0.0000***	-4.7334	0.0000***
EK	-9.83772	0.0000***	-5.94747	0.0000***	-4.14018	0.0000***
FI	-9.28983	0.0000***	-5.70349	0.0000***	-4.79065	0.0000**

Notes: Lag length is determined according to the Akaike information criterion. Maximum lags are determined 2. *, ** And ***, respectively, 0.10, 0.05 and 0.01 indicates the level of statistical significance.

As is understood from Table 4, the current ratio (CR), leverage ratio (LR), economic instability (EI) and the financial instability (FI) are stationary at their first differences.

There are three objectives in the study. The first of them is to determine whether there is a long-term relationship between economic instability and financial instability. For this purpose, the relation is analyzed through the Westerlund Panel Cointegration method. The results are given in Table 5.

<div align="right">**Table 5**</div>

Westerlund Panel Cointegration Analysis

	Statistics	Z	Prob.
Gt	-3.575	-7.761	0.0000***
Ga	14.017	15.164	0.906
Pt	-6.125	0.409	0.341
Pa	-5.625	-1.072	0.142

Notes: The null hypothesis is no cointegration (Westerlund (2007), p.710). Lag length is determined according to the Akaike information criterion. Maximum lags are determined 2 and leads are for 0-3. *, ** and ***, respectively, 0.10, 0.05 and 0.01 indicates the level of statistical significance.

The values of statistics, the values of probability and the values of Z be viewed in Table 5 for Gt, Ga, Pt and Pa. According to the statistical values of Ga, Pt, Pa, the null hypothesis, in which there is no cointegration, is accepted. Therefore, the existence of a long-term relation between the economic instability and the financial instability is not mentioned.

The second objective of the study is to demonstrate the causal relation which is between the economic instability and the financial instability. Within this context, the relation between the

variables is examined with the Holtz-Eakin Causality analysis. The findings are shown in Table 6.

Table 6

Holtz-Eakin Causality Analysis for Economic Instability and Financial Instability

Null Hypothesis	F Statistic	Prob.	Decision
FI doesn't Granger-cause EK.	0.7852	0.3766	Accepted
EK doesn't Granger-cause FI.	0.0001	0.9914	Accepted
Notes: Lag length is determined according to the Akaike information criterion. Maximum lags are determined 2. *, ** and ***, respectively, 0.10, 0.05 and 0.01 indicates the level of statistical significance.			

It can be viewed in Table 6 that there is not any causal relation from the economic instability to the financial instability and from the financial instability to the economic instability. In other words, it is not possible to mention bidirectional causality between the economic instability and the financial instability.

The last objective of the study was to examine the existence of any causal relation between the loan rate of the firms act with the motive of obtaining more profit in case of the emergence of the economic stability and the profitability ratio in capitalist systems. Within this context, whether there is a causal relation between the profitability rates and the loan rates was analyzed through the Holtz-Eakin causality analysis. The results are shown in Table 7.

Table 7

Holtz-Eakin Causality Analysis

Null Hypothesis	F Statistic	Prob.	Decision
CR does not Granger-cause ROA.	7.7860	0.0057***	Rejected
ROA does not Granger-cause CR.	2.7922	0.0962*	Rejected
LR does not Granger-cause ROA.	1.5543	0.2138	Accepted
ROA does not Granger-cause LR.	0.5876	0.4442	Accepted
STD does not Granger-cause ROA.	0.5170	0.4729	Accepted
ROA does not Granger-cause STD.	4.8870	0.0282**	Rejected
NPM does not Granger-cause ROA.	5.9616	0.0155**	Rejected
ROA does not Granger-cause NPM.	5.8971	0.0160**	Rejected
ROE does not Granger-cause ROA.	11.5432	0.0008***	Rejected
ROA does not Granger-cause ROE.	6.2938	0.0129**	Rejected

Null Hypothesis	F Statistic	Prob.	Decision
ACP does not Granger-cause ROA.	2.4063	0.1223	Accepted
ROA does not Granger-cause ACP.	0.0541	0.8162	Accepted
ICT does not Granger-cause ROA.	0.2233	0.6370	Accepted
ROA does not Granger-cause ICT.	0.0451	0.8320	Accepted
LR does not Granger-cause CR.	2.6696	0.1038	Accepted
CR does not Granger-cause LR.	0.0503	0.8227	Accepted
STD does not Granger-cause CR.	0.0001	0.9732	Accepted
CR does not Granger-cause STD.	0.8602	0.3547	Accepted
NPM does not Granger-cause CR.	0.0008	0.9925	Accepted
CR does not Granger-cause NPM.	0.1510	0.6979	Accepted
ROE does not Granger-cause CR.	0.1284	0.7204	Accepted
CR does not Granger-cause ROE.	0.5583	0.4558	Accepted
ACP does not Granger-cause CR.	15.7767	0.0001^{***}	Rejected
CR does not Granger-cause ACP.	37.5598	0.0000^{***}	Rejected
ICT does not Granger-cause CR.	0.1132	0.7368	Accepted
CR does not Granger-cause ICT.	0.0819	0.7750	Accepted
STD does not Granger-cause LR.	11.0293	0.0010***	Rejected
LR does not Granger-cause STD.	5.1960	0.0237**	Rejected
NPM does not Granger-cause LR.	0.0027	0.9579	Accepted
LR does not Granger-cause NPM.	7.6385	0.0062***	Rejected
ROE does not Granger-cause LR.	7.7476	0.0059***	Rejected
LR does not Granger-cause ROE.	2.1119	0.1477	Accepted
ACP does not Granger-cause LR.	0.5905	0.4431	Accepted
LR does not Granger-cause ACP.	0.1884	0.6647	Accepted
ICT does not Granger-cause LR.	1.4426	0.2310	Accepted
LR does not Granger-cause ICT.	1.2166	0.2712	Accepted
NPM does not Granger-cause STD.	1.5750	0.2109	Accepted
STD does not Granger-cause NPM.	2.4778	0.1170	Accepted
ROE does not Granger-cause STD.	2.3767	0.1247	Accepted
STD does not Granger-cause ROE.	5.8741	0.0162**	Rejected
ACP does not Granger-cause STD.	0.2331	0.6297	Accepted
STD does not Granger-cause ACP.	0.0035	0.9526	Accepted
ICT does not Granger-cause STD.	0.1424	0.7062	Accepted
STD does not Granger-cause ICT.	0.2858	0.5934	Accepted
ROE does not Granger-cause NPM.	16.3482	0.0001***	Rejected
NPM does not Granger-cause ROE.	0.2220	0.6380	Accepted
ACP does not Granger-cause NPM.	0.0352	0.8513	Accepted

Null Hypothesis	F Statistic	Prob.	Decision
NPM does not Granger-cause ACP.	0.1167	0.7330	Accepted
ICT does not Granger-cause NPM.	0.0832	0.7733	Accepted
NPM does not Granger-cause ICT.	3.1583	0.0769[*]	Rejected
ACP does not Granger-cause ROE.	0.2480	0.6189	Accepted
ROE does not Granger-cause ACP.	0.2752	0.6004	Accepted
ICT does not Granger-cause ROE.	0.7066	0.4016	Accepted
ROE does not Granger-cause ICT.	0.1671	0.6831	Accepted
ICT does not Granger-cause ACP.	0.0052	0.9424	Accepted
ACP does not Granger-cause ICT.	0.1629	0.6812	Accepted

Notes: Lag length is determined according to the Akaike information criterion. Maximum lags are determined 2. [*], [**] and [***], respectively, 0.10, 0.05 and 0.01 indicates the level of statistical significance.

According to Table 7, it can be said that there is bidirectional causality between the current ratio and the return on assets. Similarly, it was determined that there was bidirectional causality between the return on assets and the net profit margin as in the relation between the return on equity and return on assets. In addition, in Table 7, it can be seen that there is bidirectional causality between the average collection period and the return on assets. It was, also, concluded in the study that there were three one-way causality Firstly, it was observed that there was causality from the return on assets to the short term debt ratio. Secondly, it was determined that there was causality from the return on equity to the net profit margin. Lastly, it was seen that there was a one-way causality from the net profit margin to the inventory cycle time. Another considerable finding from the study is that there is not any relation of causality between all the other variables.

5. Conclusions

Minsky's Financial Instability Hypothesis is discussed on the basis of firms in the study. And, any short-term and long-term relations have not been observed between the economic instability and the financial instability. In the manufacturing industry field, there are 147 firms traded in BIST. As to this study, 15 firms traded in BIST have taken into consideration. Minsky's Financial Instability Hypothesis has been examined in terms of these 15 companies, and no relations have been determined between the economic instability and the financial instability both for the short-term and long-term

relations. Within this context, it may well be suggested that the Economic Stability-Financial Instability-Economic Instability Cycle of Minsky was not supplied for metal manufacturing industry for the period of 1994-2010.

In the study, due to the low number of the chosen firms within the manufacturing industry, it cannot be said that the findings reached would reflect the whole. In this regard, it is thought that if the findings are tested by spreading to a more extensive sample, different results will be obtained.

In terms of causal relations between borrowing and profitability, bidirectional causality were determined among ROE and ROA, CR and ROA, ACP and CR, STD and LR, ROE and LR. Also it was obtained that NPM was the reason of ICT; and ROE was the reason of NPM. No other causality was observed between other variables.

In this study, the validity of Minsky's Financial Instability Hypothesis is examined for the manufacturing industry sector. It is thought to be enlightening for the policymakers in organizing financial markets. Moreover, the results of the study also provide information on the relation between the profitability and borrowing of the real sector. For future studies researching the validity of Minsky's Financial Instability Hypothesis, it is considered that the sample is not to be limited with only manufacturing sector. Thus, the validity of the hypothesis can be examined more inclusively, and also, the results obtained can be generalized. Accordingly, for future studies, it is recommended to check the validity of Minsky's Financial Instability Hypothesis in the other sectors except for the manufacturing industry.

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