Study of the relationship between monetary policy, accounting conservatism and corporate trade credit

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ABSTRACT

This study investigated the relation between trade credit and monetary policy and conservatism. Population consisted 74 corporates listed on Tehran Stock Exchange during 2009 to 2015. Dependent variable was trade credit. Given data was gathered and categorized in Excel file as data reference. Also, hypothesis were tested using multivariate regression models based on integrated data techniques through econometrics Eviews software. Results suggested that high conservatism corporates had more trade credit and there was positive significant relationship between conservatism level and trade credit. Also, there was positive significant relationship between tight monetary policy and trade credit.

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Introduction

The main role of conservatism, as one of the basic features of accounting, is to promote the signing of debt contracts through preventing the enterprises of over-reporting their assets and therefore damaging creditors interests (Watts, 2003). The creditors of an enterprise are mainly banks, trading partners (i.e. suppliers and customers), thus, there is two types of debt contracts: bank credit contract and trade credit contract. Previous studies focused on conservatism in bank credit and less attention being given to trade credit (Hui et.al. 2012). However, trade credit is used in both developed and developing countries. In England, for example, trade credit consists 70% of short-term debts and 55% of trade loans (Kohler et.al. 2000). Also, Rajan and Zingales (1995) indicated that on average, trade credit consisted 17.8% of total assets of American corporates in 1991 and more than 25% of German, Italy and French corporates. Although, the financial system of the country is not on the top of the table, the trade credit play main role in the national economy. Focusing on conservatism and made changes in the accounting monetary policies, we studied that how these two elements influenced on trade credit. Also, we discussed about the different effects of conservatism on trade credit with various fields.

Currently, literature related to trade credit are mainly based on alternative financial theories and market power. From demand perspective, alternative financing theory holds that credit rationing prevents from some corporates from obtaining enough lending. So, they turn to the trade credit financing despite of bearing high costs of trade credit (Petersen and Rajan, 1997). From supply perspective, the market power believes that the supplier (customers) initiates to provide a large amount of low cost trade credits to a corporate to promote sales (supplies) given to market power. Regardless of what the theories believes, a corporate seek trade credit to sign debt contract with a supplier and or a customer. Hui et.al. (2012) argue that since the conservatism can recognize the losses, it can conserve from the customers and suppliers interests while signing the contract, and reduce potentially losses of trades. Therefore, to answer to the first question, we examine that whether the corporates with high conservatism can obtain more trade credit?

Second, how conservatism accounting can effect on trade credit when applying the monetary policies? During a period of tight monetary policy, credit discrimination problem or trade rationing problem become worse and more difficult for a corporate to obtain bank loans. In the meantime, the suppliers or customers become more conservative to provide trade credit because of the increasing of the uncertainty in the economic environment. Therefore, to answer to the second question, we examine that whether conservatism accounting has significant effective on obtaining trade credit when demand for trade credit increases and the supply decreases?

Literature Review

A corporate creditors are mainly the banks and trade partners such as brokers and customers, so there are two types of debt contracts: Bank credit contracts and trade credit contracts. Previous studies focused on the effect of accounting conservatism on bank credit and less attention being paid to trade credit. Though, trade credit is widely used in the developed and developing countries. For example, in England, the trade credit is calculated on the 70% of the short-term debts and 55% on the credit loans. Rajan and Zingales indicated that on average, the trade credit was calculated for 17.8% of total assets of USA companies in 1991, and for over of 25% of assets of their German, Italy and French counterparties. Currently, the trade credit materials are mainly based on alternative financing and marketing power theories. From demand perspective, alternative financing theory indicates that credit rationing prevent of getting loan by some companies. Therefore, they turn to the trade credit financing. Despite of having to bear high trade credit costs in terms of cater, the market power theory suggests that according to market power, the caters (customers) initiate to provide a large amount of low-cost trade credits for a company to raise the sale of supplies. Regardless of which theory being used, the company seeks the global credit to sign loan contract with suppliers or customers. Also, as the accounting conservatism can recognize the damages in a method, it can conserve the supper and customer interests when signing the contract. And, it can reduce the amount of hidden losses in such trades. During the tight monetary policies, the credit discrimination or credit rationing problems become worse and obtaining bank loans by companies becomes more difficult. At the same time, the customers or suppliers will be cautious about trade credit because of the increasing of uncertainty in the economic environment (Dai and Yang, 2015).

Empirical Studies

Biodery et.al. (2001) found that the frequent changes in the monetary policies in 1980 caused that total variance of investment in the mentioned companies be smaller than the investment variance in 1970. It indicated that the investment behavior features of a corporate turn to steady state when facing with uncertainty according to monetary policies.

Zang (2008) concluded that high conservatism cause that a company violate the limited clauses in the debt contracts simply, and it helps to the creditors to perform the contract with more speed and or they pass up it. So, as the accounting conservatism is high, lower the interest rates on loan is paid by companies. Similarly, the conservatism can also reduce information asymmetry and conserve more of the interests of suppliers and customers, and help to both parties to create cooperative relationships with mutual trust, so that the suppliers and customers tend to accept certain degree of risk and they provide more trade credit. In contrast, if the accounting reporting of a company is less conservative and it cannot conserve the interests of the suppliers and customers, the payment terms required by suppliers and customer will be more accurate, because they tend to conserve from their interests through controlling the risk. Accordingly, they do not offer a large amount of their trade credit.

Wonfong Woo et.al, studied the relationship between financial development and trade credit with cash capitals among Chines corporates in 2011. Using regression methods, this study examines that whether financial depth helps to the companies to use efficiency from trade credit in short-term and to hold low cash.

Khanalizadeh et.al. (2013) studied the trade credit and the performance of companies listed in Tehran Stock Exchange. Thus, payable accounts is used as trade credit agent and corporate assets returns, payment period to corporate creditors, capital return of corporate, net margin of the corporate and investment return of the corporate were used to test the performance of the corporate. Hence, 59 companies were examined during 2001-2009. Results indicated that there was positive significant relationship between payable account and payment period to corporate creditors, capital return of corporate, net margin of the corporate, investment return of the corporate. According to the results of this study, the trade credit has a positive significant relationship with corporate performance.

Ghafari and PourZamani (2013) evaluated the relationship between trade credit level and financing limitations on dividend policy. For this purpose, data of 185 corporates listed in the Tehran Stock Exchange was used during 2006-2011. Many factors can effect on dividend policy which two main variable were considered including trade credit level and financing limitations on dividend policy using Pearson Correlation Coefficient and Regression model. Debt ratio variable, liquidity ratio, financial leverage, growth opportunities and corporate size were used as covariates to evaluate effect of the above variables. As expected, hypothesis test indicated a direct and significant relationship between trade credit level and dividend ratio, and an inverse significant relationship between financing limitations and dividend ratio. Results of this study were in consistent with the some similar studies.

Hypothesis
Hypothesis are developed as the following given to literature and in regard to answer to the research questions.
H1: The corporates with high conservatism has higher trade credit.
H2: The corporate with high conservatism has higher trade credit by adopting tight monetary policy in macro-level.

Methodology
This study is an applied one objectively, a descriptive based on research method and a correlation research in terms of descriptive studies. Geographical and time delimitations of this study have been determined as the companies listed in the Tehran Stock Exchange in time intervals of 2009-2015. Financial Statement data of these companies has been used to test the research variables. All the companies which meet

the following conditions are chosen as sample and otherwise they were excluded. The conditions are:
1. The company has no fiscal year change, in other word end of fiscal year be March 29.
2. The company be accepted in the Stock Exchange Before 2012 and it act by the end of research period.
3. Required data related to company be available for studies and accurate calculations.
4. Trading symbol of the company be active and it was traded in the Stock Exchange at least for one time in a year.
5. Financial intermediaries companies (investment, holding, leasing and banks) are excluded from the study.

According to the above conditions, the population consists 110 companies. Since in the case study, the results is generated to the total population, so, it should be tried that the sample reflect the society fully, and it reflect the certain features. In other words, we should select the sample so that it has as representative state for the main society. Therefore, we should be careful in the selecting the sample and we meet the following conditions:
- The sample is selected according to research objectives.
- Not biased sample selection.
- Sample size is determined according to the objectives of the study.

In this study, the random sampling method was used. In this method, equal probable is dedicated to the each of samples to be selected in the sample size.
Cochran formula was used to compute sample size which is as follows:

$$n = \frac{NZ^2 pq}{Nd^2 + Z^2 pq}$$

After inserting the values in the formula, the sample size was calculated as the follows:

$$n = \frac{110 \times (1.110)^2 \times 0.5 \times 0.5}{110 \times (0.05)^2 + (1.110)^2 \times 0.5 \times 0.5} \cong 86$$

Eventually, 86 companies were selected as final sample size according to applied limitations and using random sampling method.

Used pattern to test hypotheses
Research Model
The first and second models are used to test the first and second hypotheses respectively.

$$TC_{i,t} = \beta_0 + \beta_1 C - Score_{i,t-1} + \sum \beta_n Controlvariables_{i,t} + \varepsilon_{i,t} \qquad \text{(Model 1)}$$

$$TC_{i,t} = \beta_0 + \beta_1 C - Score_{i,t-1} + \beta_2 MP_{i,t} + \beta_3 MP_{i,t} * C - Score_{i,t-1} + \sum \beta_n Controlvariables_{i,t} + \varepsilon_{i,t} \qquad \text{(Model 2)}$$

Research Variables
The used variables in this study including dependent and independent variables are measured as:

1. Dependent variable:
Trade credit (*Trade-Credit*) which is measured using the following equation:

$$Trade - Credit = \frac{TAR + TAP}{NetAsset}$$

That we have:
TAR: Total accounts and receivables of the corporate
TAP: Total accounts and payable of the corporate

$$EARN_{it} = \beta_0 + \beta_1 D_{i,t} + \beta_2 Return_{i,t} + \beta_3 D_{i,t} * Return_{i,t} + \varepsilon_{i,t}$$

In this model, we have

NetAsset: Net assets of the corporate which is measured through difference between total assets and debts.

2. Independent Variable
The independent variable of the first hypothesis is Conservatism (*C-Score*).
Khan and Watts (2009) is used to measure the conservatism. This model starts with the equation (1) as the Basou model (1997). To measure conservatism, we firstly describe the below regression model which is as the same of the Basou model (1997).

EARN: Earn before unexpected items to capital market value at the beginning of the period ratio

D: If the yearly return is negative, it will be one, otherwise it will be zero.

Return: Real return per share was measured yearly through the following equation:

$$R_{it} = \frac{p_t(1 + \alpha + \beta) - (p_{t-1} + c\alpha) + D}{p_{t-1} - c\alpha} \times 100$$

Which, we have

D: Dividends per share during each year

α: Capital increasing percentage from reserves

β: Capital increasing percentage from receivables and cash assets

P_t: Share price at the end of time t

P_{t-1}: Share price in the beginning of the time t-1

C: nominal value of share

$\varepsilon_{i,t}$: Regression residual agent

i: Corporate agent and t as the year under study

Then and according the above hypotheses, Khan and Watts (2009) presume that good news timing each year (Gscore) and bad news differential timing each year (Cscore) are linear functions of the corporate features each year (Size, Market value to book value ratio, and leverage). It means that:

$$Gscore = \beta_2 = \mu_0 + \mu_1 Size_{i,t} + \mu_2 MB_{i,t} + \mu_3 Lev_{i,t} + \varepsilon_{i,t}$$
$$Cscore = \beta_3 = \gamma_0 + \gamma_1 Size_{i,t} + \gamma_2 MB_{it} + \gamma_3 Lev_{it} + \varepsilon_{i,t}$$

Which, we have

$MB_{i,t}$ is the equity book value-to-equity market value ratio of the corporate I in year t.

$Size_{i,t}$ is the logarithm of total assets book value of the corporate I in year t (To control the effect of the size of the corporates)

$Lev_{i,t}$ is the leverage, i.e. the ratio of long-term debts book value to total assets book value of the corporate I in year t.

Both criteria GScore and CScore measure the changes in the corporate and also the changes overtime. These criteria change through cross-fluctuations in the corporate-year features in the corporates and through temporary changes in μ and λ and corporate-year features overtime. These equations are not regression models themselves, but the right side of the equation is alternated by β_2 and β_3 in the above regression model respectively, and the following regression model is yield:

$$EARN_{it} = \beta_0 + \beta_1 D_{i,t} + (\mu_0 + \mu_1 Size_{i,t} + \mu_2 MB_{i,t} + \mu_3 Lev_{i,t}) + (\gamma_0 + \gamma_1 Size_{i,t} + \gamma_2 MB_{it} + \gamma_3 Lev_{i,t}) D_{i,t} + \varepsilon_{ijt}$$

The yield regression model is as the same of the previous regression model which the above equation was alternated in. To measure the conservatism criteria (CScore), we firstly estimate the yearly cross-regression in the above model and determine the Landa coefficients (λ) and then replace them in the CScore equation and in this way we measure the conservatism variable.

Independent variable of second hypothesis (MP$_{i,t}$*C-Score)

This variable is as the product of the two independent variables which statistically it means the interaction between

two variables. It means that both variables occurs simultaneously which we mention how to measure the conservatism variable. The tight monetary policy is a dummy variable. To measure it from gross domestic product (GDP), its growth to previous period was measured according to the following equation:

$$If \frac{\Delta GDP}{GDP_{t-1}} - \frac{\Delta M2}{M2_{t-1}} > 0, than\ MP = 1\ ; otherwise$$

3. Control Variable

MPOWER is indicative of market power and is a dummy variable. If the corporate sale-to-industry sale ration is more than average of the industry, its value will be one, otherwise it will be zero.

STATE is a dummy variable. If the corporate is a state corporate, its value will be one, otherwise zero.

LOAN is the bank debt level of corporate i in year t.

AGE is the logarithm of age of the corporate i in year t.

Size is the logarithm of total assets book value of corporate I in year t (To control the effect of corporates size)

CFO is the operating cash flow to total assets book value ratio of the corporate i in year t.

LIQ is the current asset-to-total assets book value ratio of the corporate i in year t.

EBIT is earning before interest and tax-to- total assets book value ratio of the corporate i in year t.

GROWTH is the growth of the sale of the corporate i in year t than previous year

Findings

Descriptive Statistic

It is necessary to know the descriptive statistic to consider general features of the variables and to analyze them. The following table present the descriptive statistic related to use variables. Descriptive statistic related to 86 corporates during seven years (2009-2015).

Table 1 Descriptive statistic related to research variables

Variable	Mean	Minimum	Maximum	Standard Deviation
CFO	0.413	0.0020	0.550	0.0526
GROWTH	0.466	0.027	0.622	3.968
SIZE	12.190	10.815	18.603	2.447
EBIT	0.451	0.138	0.802	2.200
AGE	3.647	3.737	2.397	3.067
M2B	2.25	-0.477	6.168	33.154
LIQ	0.526	0.081	0.956	0.211
LOAN	62727.20	103	8274185	426.81
Trade-credit	0.176	0.005	0.581	0.125

Review of the variables Stationary

Regression models validity was measured using the basic assumptions of the regression. In our study, these assumptions and their results are as the following. Im, Pesaran and Shin tests were used to consider the reliability of the variables which the results are provided in the table 2.

Table 2 review of the research variables stationary

Variable	Im, Pesaran and Shin test		Result
	Test statistic	Sig level	
CFO	-105.564	0.0000	The variable is reliable
GROWTH	-16.8733	0.0000	The variable is reliable
SIZE	-2.0683	0.0000	The variable is reliable
EBIT	-9.5907	0.0000	The variable is reliable
AGE	-9.4782	0.0000	The variable is reliable
LOAN	-14.3886	0.0000	The variable is reliable
LIQ	-13.1447	0.0000	The variable is reliable
Trade-credit	7.4551	0.0000	The variable is reliable
			The variable is reliable

Given that the sig level of all variables is lower than 0.05, we can conclude that the research variables are reliable and they are independent.

Heterogeneity Test of the Variance
In this study, White test was used to consider the problem of the heterogeneity of the variance.

Table 3 the results of Breusch–Pagan test for the discovery of the heterogeneity of the variance

	F statistic	P-Value	Result
First model	4.254833	0.0000	H0 is rejected (there is heterogeneity of the variance)
Second model	4.254833	0.0000	H0 is rejected (there is heterogeneity of the variance)

Given to the results of White test, the sig level of all models is lower than 0.05. Therefore, the hypothesis of the heterogeneity of the variance related to fit regression model is accepted.

Results

First Hypothesis results:
H1: The corporates with high conservatism has higher trade credit.
The results of estimation of the research model is provided in the table 4.

Table 4 Summary of the results of model test

Variable	Coefficients	T test	Sig level	Collinearity test
y-intercept	-3.130	-1.508	0.133	----
C-Score	0.0481	2.258	0.025	1
MPOWER	0.280	1.722	0.087	2.8
CFO	0.00382	2.3192	0.0218	1.21
GROWTH	0.0435	0.748	0.4552	1
SIZE	-0.5358	-1.0423	0.299	1
EBIT	0.0594	0.3941	0.694	1
LOAN	-0.0005	-0.6649	0.5071	1
AGE	-6.844	-0.348	0.7278	1.2
LIQ	2.441	3.081	0.000	1
F statistic (Sig level)		7.1335 (0.000)	Durbin-Watson statistic	2.13
Coefficient of the determination (R^2)		0.64	Adjusted coefficient of the determination	0.55

Also, we should ensure of the validity of the results before hypothesis tests according to results. For this purpose, F test was used to consider significance level of the total model. According to F test (0.000), we can claim that the fit regression model is significant.

According to determination coefficients of the fit model, Independent variables can describe 64% the changes in the dependent variable (trade credit). In the next section, we consider the hypotheses.

Estimated coefficient of the independent variable of conservatism (C-Score) in the above table suggesting the positive significant relationship between conservatism and trade credit of the listed corporates in the Tehran Stock Exchange (p=0.05). Because the P-value for this independent variable is lower than 0.05. Therefore, we can conclude that there is positive significant relationship between conservatism and trade credit of the listed corporates in the Tehran Stock Exchange. In other words, there is significant relationship at 95% confidence level which suggesting the confirmation of the first hypothesis.

Second Hypothesis Results

H2: The corporates with high conservatism has higher trade credit by adopting tight monetary policy in macro-level.

Results related to the estimation of the research model is provided in the table 5.

Table 5 Summary of the results of model test

Variable	Coefficients	T test	Sig level	Collinearity test
y-intercept	1.411	2.121	0.000	----
C-Score	0.531	2.331	0.049	1.25
MP	-2.388	-6.441	0.000	1.24
$MP * C - Score$	1.127	3.022	0.000	1.18
MPOWER	5.081	1.811	0.412	1.11
CFO	0.788	1.774	0.727	1.16
GROWTH	1.871	2.271	0.002	1
SIZE	5.588	2.615	0.031	1
EBIT	0.187	5.618	0.000	1
LOAN	5.446	1.214	0.164	1
AGE	0.009	4.664	0.000	1.17
LIQ	3.332	8.881	0.000	1.20
F statistic (Sig level)	6.771 (0/000)	Durbin-Watson statistic		2.26
Coefficient of the determination (R^2)	0.54	Adjusted coefficient of the determination		0.51

In this hypothesis, we also should ensure of the validity of the results before hypothesis tests according to results. For this purpose, F test was used to consider significance level of the total model. According to F test (0.000), we can claim that the fit regression model is significant.

According to determination coefficients of the fit model, we can conclude that independent variables can describe 54% the changes in the dependent variable (trade credit). In the next section, we consider the hypotheses.

According to conservatism and tight monetary policy variables tests (MP*C-Score) in the above table, we can see that this variable is positive and significant in P=0.05. Because, P-Value for these independent variables. Therefore, we can conclude that there is positive significant relationship between tight monetary policy and conservatism with trade credit of the listed corporates in the Tehran Stock Exchange.

Conclusion and implications

Currently, the literature related to trade credit focused on financing theories and alternative of market power. From demand perspective, alternative financing theory holds that credit rationing prevents from some corporates from obtaining enough lending. So, they turn to the trade credit financing despite of bearing high costs of trade credit (Petersen & Rajan, 1997; Biais & Gollier, 1997). So, they turn to trade credit financing despite of the need to bear higher costs of trade credit. From supply perspective, the market power holds that the supplier (customers) initiates to provide a large amount of low cost trade credits to a corporate to promote sales (supplies) given to market power (Summers & Wilson, 1999; Fisman & Raturi, 2004; Wan horen, 2005). Regardless of what the theories believes, a corporate seek trade credit to sign debt contract with a supplier and or a customer. Hui et.al. (2012) argue that since the conservatism can recognize the losses, it can conserve from the customers and suppliers interests while signing the contract, and reduce potentially losses of trades. Second, how conservatism accounting can effect on trade credit when applying the monetary policies? During a period of tight monetary policy, credit discrimination problem or trade rationing problem become worse and more difficult for a corporate to obtain bank loans. In the meantime, the suppliers or customers become more conservative to provide trade credit because of the increasing of the uncertainty in the economic environment.

First Hypothesis: The corporates with high conservatism has higher trade credit. The results showed that there is positive significant relationship between conservatism and trade credit in the listed corporates in the Tehran Stock Exchange. So, we can conclude that the first hypothesis is accepted.

Second Hypothesis: The corporate with high conservatism has higher trade credit by adopting tight monetary policy in macro-level. Results showing the positive significant relationship between tight monetary policy and trade credit in the listed corporates in the Tehran Stock Exchange. So, we can conclude that the second hypothesis is accepted.

Previous studies focused on the effect of accounting conservatism on bank credit (Jang, 2008; Rao & Jiang, 2011; Jo, 2011; Chang & Lio, 2013) and less attention being paid to trade credit. However, the trade credit has been widely used in the developing and developed countries. For example, in England, the trade credit is calculated on the 70% of the short-term debts and 55% on the credit loans (Kohler et.al, 2000). Rajan and Zingales indicated that on average, the trade credit was calculated for 17.8% of total assets of USA companies in 1991, and for over of 25% of assets of their German, Italy and French counterparties. Although the chines financial system is not accurate, the trade credit play absolute role in the national economy.

Implications

In this study, the necessary tests was conducted to consider the relationship between financial reporting quality and corporate performance. Role of each of these variables is bold to make good decisions and to help to the investors to make accurate decisions. Also, one of the strategic objectives of the study is to find suitable and applied solutions. Although, we seek to reduce risks and existing errors in the Stock Exchange, we seek to find applied and good solutions.

1. According to results, we can say that the monetary policies can influence on national economy through different channels such as currency rate and credit channels. Whereas, conservatism approach in accounting as an effective control mechanism in the identifying of bad news than good news prevent of the over-optimism of the managers and it provide a framework to identify the economic events.

2. The results showed that the conservatism in accounting as one of the substantial feature in the accounting reposting play an important role in promoting of debt contracts signs. Through prevention of the over-reporting of a corporate assets, a barrier is created to damage of the interests of the creditors, and therefore the corporate trade credit is influenced and is caused to use from monetary policies.

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