

Analyzing the Impacts of Credit Constraints on Exporting Prospect of Companies Listed In Tehran Stock Exchange (TSE)

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Abstract: Credit constraints seriously challenge the investments in and the growth of companies in developed and developing countries. This is because the failure of these companies to secure external finances hinders their development. In addition, adoption of the right export strategies by financial managers of manufacturing companies as well as the relation between credit constraints and investments are crucial to development of any company. This research, via the adoption of Logit model, attempted to analyze the impacts of credit constraints on the probability of exports by companies present in Tehran Stock Exchange (TSE) during 2008 -2014 time period. The statistical population covered 102 companies listed in Tehran Stock Exchange (TSE). The result showed that the impacts of the independent indicator of credit constraint or KZ indicator on the virtual dependent indicator of 0 and 1 of export probability would be 1 in case of export probability and 0 if proved otherwise. This indicates the existence of an inverse relation between credit constraints and the export probability in sample companies, i.e. decreased credit constraints enhances the probability of exports and vice versa. The findings could prove a great help to commercial managers in adoption of financial reporting procedures that may provide shareholders with correct and accurate information for financial decision-making.

Keywords: Credit Constraints, Exports, Tehran Stock Exchange Companies

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I. Introduction

Credit constraints are an essential issue for every company. There is no consensus among researchers about how credit constraints impact investment and financing policies and procedures. Credit constraints are primarily concerned with the issue of investing in manufacturing companies and thus the effects of credit constraints on exports and investment is of high importance. In addition, adoption of the right export strategies by financial managers of manufacturing companies as well as the relation between credit constraints and investments are crucial for financial managers of manufacturing companies. Credit constraints hinder the investments in and the growth of companies in both developed and developing countries as the failure of these companies to secure external finances delays their development. Many researchers have singled out the high sensitivity of cash flows of investment efforts which refers to the changes in capital expenses of a company against the rate of changes in cash flows as the primary indicator of credit constraints. In other words, if a company encounters numerous credit constraints to secure funds, it will thus become more dependent on internal finances and consequently become more sensitive to investment cash flows. In case of financial hurdles and investment constraints, investments are associated with the availability of cash flows since credit constraints reduce the financial flexibility and as a result intensify dependency on internal financing.

Immediately after the introduction of the capital, every company figures out its target capital level. A company is said to be inflicted with credit constraints if the capital level does not reach the defined optimal level. In models where contracts are not completely performed, companies are inclined to venture in exports. This inclination will be much stronger in absence of credit constraints. It should be noted that considering a level of credit constraint, the probability of exports or the volume of exports in a country grows in proportion to the size of exporting companies.

The causal relation between credit constraints and trading with foreign markets is largely unknown. On one hand, companies with a high openness trading degree (open companies) may have access to external finances, especially if the country of origin is a strong exporter. On the other hand, these companies may solely focus on exports since they can successfully overcome their credit constraints. In practice, there are excess costs to pay for discovering foreign markets while required investments have to deal with credit constraints. As a result, only companies which are free of credit constraints could practice exporting. This demonstrates the significance of this research which is associated with commercial management as it addresses the factors impacting the exports in stock exchange companies. In addition, the research findings will help stock exchange planners and experts capture the effects of influential factors on exports.

II. Research Background

2.1 Exports

Exporting performance is a result of organizational operations which include achievements and external and internal goals of a given company. Here, exporting performance is defined as the realization of organizational goals which will be considered in development of products and markets, factors that lead to the profitability of a company. The success of a company could be measured via looking at its exporting profile. Three financial, non-financial and compound criteria have been developed for measuring the exporting profile. Financial criteria include sales, profits and growth while non-financial criteria are comprised of success, satisfaction and achievement of goals. Compound criteria are based on a variety of factors.

Various researches have been conducted on exporting profiles of companies. Variables addressed in these researches were directly or indirectly influential on exporting profiles of every company in the views of the researchers. The number of variables has been rather large which even in some cases has led to development of contradictory findings and conclusions. Most initial researches were focused on distinguishing exporters from non-exporters, i.e. they were primarily focused on internationalization process the companies in question were experiencing. Later, researchers went about the external factors which were influential on exporting behaviors of the companies such as proper incentive programs. In the next stage, the researchers addressed the factors influencing the exporting profile in relation to the volume of exports and its results. The fourth category included the variables that were influential on the exporting success. For instance, Casikid et al presented a model to examine the effects of three factors of concrete characteristics of companies, variables associated with exporting perception (size and experience of exports, exporting incentives, exporting problems, competitive advantages) and commitment to exports (a separate exports department, incursion into foreign markets, export planning and management, customer selection criteria, consistent monitoring of export markets) on exporting profiles of European companies. White, Ryans& Griffith analyzed a number of exporting performance measurement methods in the service sector. Wallace & Baker presented a model for capturing the influential variables on exporting performance. They assigned variables into two categories of intangible (tendency, skills and knowledge) and tangible (distribution, products, communicating with customers, management, and suppliers) variables. Tirkal&Ramezani looked into the effects of qualifications (technology, knowledge of market and exports and quality), marketing trend, and characteristics of a company, the strategy and the environment on exporting performance of companies. In their model, the characteristics of a company influence the exporting performance of a company through affecting the adopted strategies. Showham& Croup addressed the effects of mixed marketing variables (products, prices, location, promotion and furtherance of sales) on exporting performance of companies. In the same year and after reviewing the past researches, Zoo & Austen introduced a two-by-two framework for categorizing different influential factors on exporting performance. This framework categorizes these factors as controllable versus incontrollable and intra-organizational versus inter-organizational dimensions. A matrix is formed to categorize the influential factors once these dimensions are combined. In 2000, Dale, Tomengoch and Paul Mayers studied the effects of characteristics of a firm (size of a firm, the perceived entry barriers and years a firm has been running a business), the qualifications of a firm (exporting experience) and exports marketing strategies (focusing on a single market versus diversification of business operations and proactivity versus passivity) on exporting performance of a company. In the same year, Baldaev, Crownsu and Wagner developed a model to capture the relations between environmental characteristics (social, cultural and political), characteristics of the firm (demographical and management incentives), business strategies (diversification with low costs) and the exporting profile. In 2002, having assigned exporting companies into three categories of proponents, analysts and seekers, Showham, Adanglistha and Albaum introduced various factors that were influential on exporting performances of different firms. They concluded that there were significant relationships between new products, production management, market trends and control strategies on one hand and exporting performance on the other hand in analyst firms. In that year, Rose and Showham studied the effects of identification of market trends on exporting profits and sales. Casic, Patterson and Showham incorporated three variables of exporting perception, exporting barriers and management supports into their model as the influential factors on exporting performance. In addition to their direct influences, the first two factors imposed indirect influences on exporting performance via influencing the management support variable. In the same year and after performing multiple analyses of the previous researches, Leonadiu, Katsikiz and Samie introduced a model in which influential variables were placed in 5 categories (management characteristics, organizational factors, environmental pressures, exporting objectives and elements of exports marketing strategies). The first three variables indirectly and the second two variables directly influenced the exporting profiles of companies (YadAvaranNahandi&Darkhor, 2013).

2.2. Credit Constraints and Investment Flows

Modigliani & Miller (1958) state that investment and financing decisions of companies are independent in perfect capital markets (markets which are free of dealerships and information asymmetry issues). In other words, firms could always secure external financing with expenditures equal to their capital expenditures. However, it is unrealistic to assume that capital market will have imperfections. External and internal finances can't completely substitute each other in case of capital market imperfections (Arsalan et al, 2006).

Capital expenditures are expenses made to continue, maintain or improve the product or service delivery capacity and will bring future profits for companies (MojtahedZadeh&Ahmadi, 2008). After selecting the performance sample of 7176 companies from 1985-2003 and considering company size, financial leverage, growth opportunities and profit division percentage as credit constraints, Hovakimian and Hovakimian (2009) showed capital expenditures to be sensitive to cash flows.

George et al (2008) selected the performance of a sample of 339 Indian companies during 1995-2000 time period and showed that credit constraints including trade group, ownership structure, financial leverage and the size of the company affected the sensitivity of cash-investment flows in Bombay Stock Exchange.

By selection of a sample of 2040 Belgian companies during 1992-2003 (2007), Schoubben and Van Hulle (2007) attempted to study the effects of growth opportunities on investment sensitivities to cash flows and concluded that increased growth opportunities would reduce this sensitivity.

Once ownership was separated from management and dealerships emerged, investing free cash flows created a positive relationship between investment and cash flows (Digris and Jang, 2006). Moein (2002) studied the relation between credit constraints and investment-cash flows in American companies in the time period 1987-2001 and concluded that investment sensitivity to cash constraints experienced was stronger in companies struggling with credit constraints (Dario, 2015).

III. Research Methodology

The conceptual framework of the research is a platform where researchers propose theories about the relations between factors perceived as important in creation of questions. This is an applied research in terms of objectives. Applied research utilizes available methods, tools and models to improve the current status and/or enhance the operational productivity. The research methodology will be descriptive-applied. It is descriptive in the sense that it intends to describe the conditions or phenomena under study with the ultimate goal of obtaining a better understanding of the prevailing conditions and it is applied as the relations between variables are estimated via regression relations. In addition, this is a quantitative research as it considers the characteristics of data used for analyses of hypotheses. The model used in this research has been imported from Fauceglia (2014):

$$EXP = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_8 + \varepsilon_{it}$$

3.1 Research Statistical Population

The statistical population of the research includes all the companies listed in Tehran Stock Exchange (TSE). Categorized, audited financial data of the companies listed in Tehran Stock Exchange has been used in this research. Tehran Stock Exchange (TSE) is in possession of a virtually inclusive data about the status of companies and their financial and economic profiles. It could be claimed that it is the only channel to access financial information of companies and examine the research models. For this, systematic elimination method has been picked for sampling. The time period is 7 years from 2008 to 2014. The inclusion criteria are as follows:

1. Consistent presence in TSE through fiscal years 2008-2014
2. The end of each fiscal year must be the last month in Iranian calendar (21st February to 20th March of each year) with no changes in the fiscal year
3. Availability of the required data and information during the study time period

3.2. Data Collection Instruments and Method

Since the information concerning the research variables cover many accounting items included in audited financial statements of the companies under study, the required data will be manually extracted from the financial statements available on STE Research Management websites, Islamic Research and Development website which is affiliated with Stock Exchange Organization (www.rdis.ir), Codal Network (www.codal.ir), Integrated Informatics Systems of Publishers (www.fipiran.com) and CDs received from STE organization which seems to be the most authentic resource. In addition, other required data concerning the financial statements of companies which were in of PDF and Excel formats were collected from the information bank of Stock Exchange Organization. These data include profit and loss statements, balance sheets, profit prediction etc.

The research hypothesis is as follows:

- Credit constraints are influential on exporting prospect of companies listed in STE.

3.3. Research Variables and Their Calculations

Dependent Variable:

A virtual 0 and 1. 1 in case of exporting by a company in a given year and 0 if otherwise.

Independent Variable:

Credit Constraints Indicator

Credit constraints in companies forming the statistical sample are the independent variable of the research. KZ indicator is the measurement criterion of credit constraints and will be computed based on a pattern of localized coefficients developed by JahanKhani&Kanani for Iranian companies (2004). KZ indicator covers number 1 to 5 in this research which will be assigned to each company based on the category of the given company. 1 indicates the highest level of credit constraints while 5 shows the lowest level of credit constraints (Jahanshad and Modanloo, 2013).

Control Variables:

Debt ratio, market- to-book value ratio, profitability indicator

3.4. Data Analysis

Eviews and Excel software were employed to carry out the regression operations. Panel data method constitutes the analysis method by using Eviews software. For this, the required tests will be examined via this estimation method and then the panel data will be verified by conducting F Limer test. Finally, Hausman test determines consistent and random effects.

3.5. Rejection or Acceptance of the Hypothesis

To test the research hypothesis, first the data integration integrity was tested via F-test and then Huasman test was conducted to find out the consistent and random effects and estimate the model. F statistic was used to examine the significance of the whole model. For this, **F** statistics and Table **F** with **K-1** and **N-K** degree of freedom at a 5% margin of error were compared to examine the whole model. In addition, **t** statistic was employed to examine the significance of independent variable coefficients. T statistic will be compared with Table **t** which has been computed at a significance level of 95% and a DF of N-K. The considered coefficient will be significant if the absolute value of t is greater than Table t, indicating a relationship between dependent and independent variables. Also, the probability value or significance level has been adopted as an alternative way to accepting or rejecting a hypothesis. If the computed value is greater than or equal the first type error (α), the null hypothesis is held while it will be rejected if it is smaller than the first type error (α).

IV. Results and Discussion

4.1. Descriptive Analysis of the Data

Descriptive analysis refers to a set of methods for collection, summarizing, categorizing and describing numerical facts. In fact, this class of statistics describes the research data and information and provides a general scheme of data for a better and faster access to them. In sum, if used properly, descriptive statistics could express the characteristics of a category of information. Central parameters and dispersion functions of these variables lie in numerical expression of primary characteristics of collections of data and thus not only contribute to a better understanding of test results, but also facilitate the comparison of tests and observations. Descriptive statistics of research variables are given in the table below.

Table 1. Descriptive Statistics

Variable	Exports	Credit Constraints Indicator	Profitability Indicator
Symbol	EXP	KZ	PRO
Mean	0.482955	2.084308	0.134091
Median	0.000000	3.807435	0.090374
Max	1.000000	4.64859	0.893744
Min	0.000000	0.190854	-0.004294
SD	0.500183	10.90514	0.366175
Skewness	0.068221	4.295301	0.175484
Kurtosis	1.004654	8.377690	2.952087

Table 2. Descriptive Statistics

Variable	Exports	Market to Book Value Ratio
Symbol	DEB	MBV
Mean	0.739536	1.064247
Median	0.670596	1.000182

Max	3.640781	1.98977
Min	0.000000	0.07128
SD	0.495954	5.374496
Skewness	3.345447	0.209279
Kurtosis	18.14056	66.09144

4.2. Normality Test

Jarque- Bera statistic is used to test the normality of the residuals. The closer this statistic to zero, the higher the probability of the significance level greater than 0.05 and thus the null hypothesis which suggests the normality of the data will not be disproved. The findings indicate the normality of research residuals.

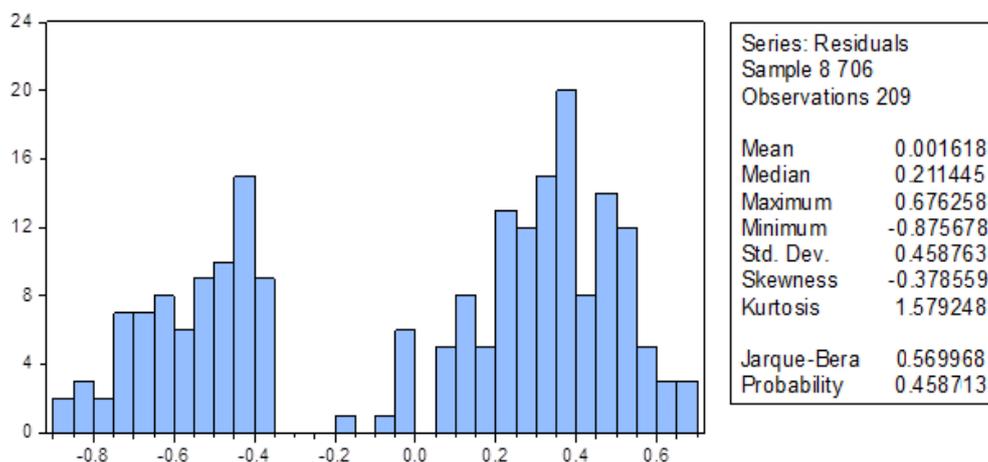


Figure 1. The normality test of residuals

The null hypothesis in this research is based on non-durability while the opposing hypothesis is based on durability of variables. The durability of the research variables in listed companies in STE has been examined.

Table 3. The Durability Results of Variables

Variable	Symbol	Levin-Lin-Chu Test	Probability	Result
Exports	EXP	-9.38682	0.0000	I (0)
Credit Constraints Indicator	KZ	-16.9820	0.0000	I (0)
Profitability Indicator	PRO	-22.1514	0.0000	I (0)
Debt Ratio	Debt Ratio	-7.09453	0.0000	I (0)
Market to Book Value Ratio	MBV	-11.43032	0.0000	I (0)

The results indicate that all research variables are durable.

4.3. F Limer Test

Although there is no Hausman test is Logistic method, F Limer test has been already conducted to identify panel data. Panel data are verified as the probability is lower than 5%.

Table 4. F test

Statistic	Probability	Result
3.70765	0.0000	Verification of Panel Data Method

4.4. Pattern Estimation

As the dependent variable is close to 0 and 1, Logistic method has been employed, the results of which are presented in Table 5.

Variables	Symbol	Coefficient	SD	Z statistic
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					Significance Coefficient
Y-intercept	C	-1.241318	1.142746	-1.086259	0.2774
Credit Constraints Indicator	KZ	0.110933	0.033951	3.267576	0.0049
Profitability Indicator	PRO	0.051753	0.020933	2.472291	0.0367
Debt Ratio	DEB	-0.930238	0.458398	-2.029324	0.0000
Market to Book Value Ratio	MBV	-0.281302	0.055223	-5.093883	
Determinant Coefficient: 0.84					

The objective determinant coefficient and level of influence are equal to 0.84 as Logistic method has been used. The result showed that the impacts of the independent indicator of credit constraint or KZ indicator on the virtual dependent indicator of 0 and 1 of export prospect which would be 1 in case of export probability and 0 if proved otherwise is positive and significant at 0.110933. This indicated that reduced credit constraints enhances exports prospects in the research statistical sample. KZ indicator is the measurement criterion of credit constraints and will be computed based on a pattern of localized coefficients developed by JahanKhani&Kanani for Iranian companies (2004). KZ indicator covers number 1 to 5 in this research which will be assigned to each company based on the category of the given company. 1 indicates the highest level of credit constraints while 5 shows the lowest level of credit constraints (Jahanshad and Modanloo, 2013). The findings reveal that if this indicators is larger and credit constraints are reduced, a firm has the capacity of investment development and increasing production which will ultimately result in increased exports.

4.5. Residuals Autocorrelation Test

BG test was conducted to check the occurrence of autocorrelation in the values of error correction pattern. Null hypothesis and its alternative in this research are as follows:

H₀: Noautocorrelation exists among the values

H₁: Autocorrelation exists among the values

Table 6. The Autocorrelation Test of Residuals

Null hypothesis and its alternative	p-value	Obs*R Statistic squared	F-statistic	Result
Acceptance of null hypothesis (no autocorrelation)	0.8519	0.309434	0.160364	H ₀ : No autocorrelation
				H ₁ : Autocorrelation

According to the results and considering the p-value, the value of probability is larger than 5% and thus the null hypothesis is accepted, i.e. the existence of autocorrelation among the error values is disproved.

4.6. Residuals Equality Test

ARCH LM test was carried out to examine the occurrence of equality of variance among the values of error correction pattern. Null hypothesis and its alternative in this research are as follows:

H₀: Variances of error values are equal

H₁: Variances of error values are not equal

Table 7. The EqualityTest of Residuals

Null hypothesis and its alternative	p-value	Obs*R Statistic squared	F-statistic	Result
Acceptance of null hypothesis (equality of variances)	0.9720	0.001243	0.001238	H ₀ : equality of variances
				H ₁ : inequality of variances

According to the results and considering the p-value, the value of probability is larger than 5% and thus the null hypothesis is accepted, i.e. error values are equal in variance.

4.7. Testing the Research Hypothesis

Research Hypothesis:

Credit constraints influence the probability of exports by companies listed in Tehran Stock Exchange (TSE) According to the results of Table 4, the results showed that the impacts of the independent indicator of credit constraint or KZ indicator on the virtual dependent indicator of 0 and 1 of export prospect which would be 1 in case of export probability and 0 if proved otherwise is positive and significant. This indicated that reduced credit constraints enhance exports prospects in the research statistical sample. KZ indicator is the measurement

criterion of credit constraints and will be computed based on a pattern of localized coefficients developed by JahanKhani&Kanani for Iranian companies (2004). KZ indicator covers number 1 to 5 in this research which will be assigned to each company based on the category of the given company. 1 indicates the highest level of credit constraints while 5 shows the lowest level of credit constraints (Jahanshad and Modanloo, 2013). The findings reveal that if this indicators is larger and credit constraints are reduced, a firm has the capacity of investment development and increasing production which will ultimately result in increased exports.

V. Conclusions

The results reveal that the impacts of the independent indicator of credit constraint or KZ indicator on the virtual dependent indicator of 0 and 1 of export prospect which would be 1 in case of export probability and 0 if proved otherwise are positive and significant. This indicates that reduced credit constraints enhances exports prospects in the research statistical sample. KZ indicator is the measurement criterion of credit constraints and will be computed based on a pattern of localized coefficients developed by JahanKhani&Kanani for Iranian companies (2004). KZ indicator covers number 1 to 5 in this research which will be assigned to each company based on the category of the given company. 1 indicates the highest level of credit constraints while 5 shows the lowest level of credit constraints (Jahanshad and Modanloo, 2013). The findings reveal that if this indicators is larger and credit constraints are reduced, a firm has the capacity of investment development and increasing production which will ultimately result in increased exports.

In addition, the results show that the impacts of the debt ratio variable on the virtual dependent indicator of 0 and 1 of export prospect which would be 1 in case of export probability and 0 if proved otherwise are negative and significant. This indicates that decreased debt ratio increases the risk of liquidity and bankruptcy risks. Higher risks bring a drop in share demands and decreases production and investment which consequently reduces production space and exports probability.

Also, the findings show that the impacts of the market to book ratio variable on the virtual dependent indicator of 0 and 1 of export prospect which would be 1 in case of export probability and 0 if proved otherwise are negative and significant. This indicates that deepening the gap between market and book values increases the risk of liquidity and bankruptcy risks. Higher risks bring a drop in share demands and decreases production and investment which consequently reduces production space and exports probability.

Finally, the results reveal that the impacts of the independent indicator of profitability indicator on the virtual dependent indicator of 0 and 1 of export prospect which would be 1 in case of export probability and 0 if proved otherwise are positive and significant. This indicate that larger profitability indicator enhances production and investment and lowers liquidity risks which consequently expands production space and improves exports probability.

VI. Suggestions for Future Research

Considering the positive, significant effects of credit constraints indicator or KZ indicator on the virtual dependent indicator of 0 and 1 of export prospect, the financial managers of the companies listed in STE are recommended to adopt policies that focus on decreasing credit constraint or increasing KZ indicator if they wish to enhance the probability of exports in their companies.

Considering the negative, significant effects of the debt ratio variable on the virtual dependent indicator of 0 and 1 of export prospect, the financial managers of the companies listed in STE are recommended to adopt policies that focus on decreasing this ratio if they wish to improve the probability of exports in their companies.

Considering the negative, significant effects of market to book ratio variable on the virtual dependent indicator of 0 and 1 of export prospect, the financial managers of the companies listed in STE are recommended to adopt policies that focus on decreasing this ratio if they wish to improve the probability of exports in their companies.

Considering the positive, significant effects of profitability indicator on the virtual dependent indicator of 0 and 1 of export prospect, the financial managers of the companies listed in STE are recommended to adopt policies that focus on increasing this indicator or improved output if they wish to enhance the probability of exports in their companies.

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