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Sensitivity of the Exporting Economy on the External Shocks: Evidence from Slovene Firms

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Abstract

In this paper we investigate the export participation of Slovene firms. We first show that sunk costs are an important factor for explaining the export behavior of Slovene firms. Next we show that when the absorption power of the exporting market declines, firms still trade with their established buyers (hysteresis) despite the fact that due to lower prices their exporting revenues decline. We show that this can be explained with high exit costs, which consist of switching costs (costs of replacing stable buyers with new ones) and cost of reducing the production (compensation money for excess workers) and high re-entry costs.

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1. Introduction

The Slovene Chamber of Pharmacy not long ago announced an increase in prices for the medicines. As a reason they have stated a higher volume of medicines and higher quality treatment of consumers. This gave them the right to higher revenues. At the same time the Chamber of Pharmacy achieved, that the first internet based pharmacy, which was established by private pharmacist (their potential competitor) was closed. [1]

Above example shows a common way for an increase in the prices in the non-tradable sector of the Slovene economy. If the none-competitive structure of the none-tradable sector is one of the main causes of Slovene inflation,[2] the optimal monetary policy should focus on the abolishment of this disproportion's (Bole, 2003). In an open economy, monetary policy should steam to dampen down the supply shocks, that are caused by increase in the prices in the none-tradable sector. Even if there exist a complete exchange-rate pass-through, targeting reduction of the *domestic inflation* remains a key factor, regardless of the fact, that such targeting causes a variability of exchange rate, which has a direct impact on the inflation. Otherwise the successful reduction of the inflation, the competitiveness of the tradable sector and the long run growth of a economy would be at stake (Aoki, 1999; Gali and Monaceli, 2000; Clarida et. al. 2001).

In this paper we analyze the sensitivity of the tradable sector of the Slovene economy to the external shocks. To known distortions, that have roots in market failures in the domestic markets (none-competitiveness of the none-tradable sector, distortions in the labor markets...) we add the specific behavior of Slovene firms in foreign markets. In comparison with their global competitors, their economic power is very small. Their sales depends heavily on a small number of buyers (*truncated firm*).[3] Hence entry and exit costs (switching costs) of Slovene firms are large. This is especially true for their main exporting market i.e. European Union (EU) markets. When the absorption power of the exporting market declines, firms still trade with

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[1] Delo, 28th and 29th April 2003.

[2] More on market failure and inflation can be found in Chinn and Johnston (1999) and Cheung et.al (1999).

[3] The term *truncated firm* stands for a firm that heavily depends on a small number of big buyers and is not yet fully developed. (i.e. restructuring process is still taking place). According to the size of the firm and development of their business functions, majority of Slovene firms can be classified into a "middle" firms (Debeljak et. al., 2002; Snaith and Walker, 2002).

their established buyers (hysteresis), despite the fact, that due to lower prices, their exporting revenues decline. However in case of the unexpected and long-term decline of absorption power or in case of the unsatisfactory policy that would lead to the reduction of the competitiveness of the tradable sector, a huge number of firms would exit from the foreign markets.

The paper proceeds as follows. We begin in section 2 with the presentation of hysteresis, which is present on key Slovene exporting markets. We explain the hysteresis with the sunk costs. In third section we developed a model that tries to explain the persistence of Slovene firms in EU markets. We show that the persistence can be explained with the high exit costs. The firm that makes most of it revenues in EU, remains in that markets despite the fact, that this worsens the financial success of it. This is especially true in case of a decline of the absorption power of EU i.e. decline in the growth rate of EU markets. The decline in demand leads to reduction in the cash flow and in order to continue the production, firms need to take loans. However indebtedness is limited. Banks namely give loans based on the expected solvency that can be seen as the credit rating of a firm. As a result, the negative external shock could be devastating for the exporting part of the Slovene economy. We conclude in section 4.

2. Hysteresis in participation of Slovene firms in exporting markets

Baldwin (1988), Dixit (1989) and Krugman (1989) explain asymmetric responses of firms on a real exchange rate changes by a sunk costs, that firms face when they enter or/and exit a market. When the firm enters a foreign market needs to cover the entry costs, which later on become sunk. As a result the entry conditions are different as the exit ones. Entry price, that needs to cover both the operational and the sunk cost, is in case of zero exit cost higher, than the exit price, that needs to cover only operational costs. In case of none zero exit cost this price can even fall below a operational costs, while firms do not exit the market. Due to the sunk costs, the

current number of exporters depends on the type and number of exporters in the previous period. This leads to hysteresis in the exporting flows. [4]

Many Slovene firms have long exporting tradition on the developed western markets (mainly on EU). Entry cost of the majority of Slovene firms on these markets are not small. They can be explained either with a establishment of long term production relationship with permanent buyers[5] or with a high cost of forming its own distribution and sales network and a creation of the trade marks in this markets.[6]

Before 1991 Slovene firms were also heavily present in the former Yugoslav markets and in the former socialist countries, mainly in Russia. At the fall of the Berlin wall and the succession of the former Yugoslavia many of them exited. At the end of nineties of previous century and at the beginning of this century they slowly started to re-enter. The re-entry of Slovene firms is due to finding new opportunities which are available with opening of these markets and with lower entry cost that Slovene firms face compared to other foreign competitors The last is a consequence of past participation of Slovene firms on these markets.

It has to be noted that increased participation of Slovene firms in former Yugoslav markets and Russia is not a simple redirection of export from developed countries to new (old) market. In the second part of nineties of the previous century Slovene firms made substantial investment in their production. This investment cycle was based on stable demand in EU (Domadenik et. al., 2002). Since the conditions on EU are worsening the increase in a demand in former Yugoslav markets and Russia allows firms to fill the excess capacities. However they do not decrease the sales to EU. Namely on one side would the exit from EU market lead to high exit costs (compensation money for excess workers) and on the other side would later re-entry on EU, that could be caused with lower profitability (high risk) of the new markets, require also a high entry costs.

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[4] The effect of sunk entry costs on export participation of firms is analyzed by a number of authors. Feinberg (1992) finds that relative increases in a number of companies are smaller for industries with large sunk costs. Campa (1993) finds that the entry of exporters to the United States is negatively correlated to the variability of a exchange rate and a size of the entry costs. Roberts and Tybout (1997) reject the null hypothesis that sunk costs have no effect on the export participation of Columbian manufacturing plants. Das et al. (2001) with the help of a dynamic model evaluate the size of sunk costs using a plant-panel data on the Columbian chemical producers.

[5] An example of such long run business relationship which usually requires also asset specific investment are Prevent, that produces seats for Volkswagen and Mura, that produces cloths for Hugo Boss.

[6] A good example is Gorenje.

Next we present a model of an entry with sunk cost. which we will later on estimate on the export participation data of Slovene firms in period 1992-2001.

2.1. Model of entry with sunk costs

Consider a company that is producing a single product, and is deciding to enter a given foreign market. Suppose that the profit maximizing quantity is one unit per year, so that the revenue from the project is simply the output price P in the home currency and P* in the foreign currency. Let ? be the rate of interest and w be the operating cost of doing business in a foreign market.

Under the standard Marshallian theory, there exist entry and exit prices P_H and P_L, which are determined by cost of capital, operating costs and sunk investment. The company accepts the project (enters the market) if the price of the product (in the home currency) exceeds the sum of operating costs an annualized cost of capital:

[1] $P ? w ? ?˙k$

Equation (1) can be rewritten by replacing the right hand side of the equation with P_H, that represents the price that triggers entry:

[2] $P ? P_H$

If the company is already present in the market, it remains there if price P exceeds at least operating costs w:

[3] $P ? w$

Operating costs w represent the lower limit P_L, which triggers exit if price of the product P falls below it. Values P_H and P_L determine the conditions for entry and exit of the company.

The presence of sunk costs apparently induces asymmetrical responses of companies to changes in export conditions, such as changes in the exchange rate.

Reaction of the company to changes in price P depends largely on whether the company exported during the previous period.

Imagine now that price P is currently between P_H and P_L. If we are not familiar with company's previous exporting status, we are not able to tell if the company is currently present in the market. Namely if the company was present in a given export market in the previous period, it is also currently present since price P exceeds exit price P_L. On the other hand, if the company was not present in the market in the previous period, it will remain absent also in the current period since price P does not exceed entry price P_H.

Expressing companies' current exporting status with a binary variable Y_t, where $Y_t = 1$ if a company is present in the export market and $Y_t = 0$ otherwise, we can write the necessary condition for a company to be present in the market as:

[4] $\qquad P ? P_H ? (P_H ? P_L) ? Y_{t?1}$

It can be seen that company's current export participation depends on current export price P and previous exporting status Y_{t-1}. If equation (4) holds, then the company is present in the export market. In more general terms, we can write equation (4) in a slightly different way by replacing price P, entry price P_H and exit price P_L with gross export profits ($?_t$), investment size k and cost of capital ?:

[5] $\qquad ?_t ? k ?? ?(1 ? Y_t)$

Equation (5) is similar to equation (4), where instead of prices P, P_H and P_L, we use gross export profits, cost of capital and previous market participation to describe export market participation.

As noted earlier, this represents only a simplified explanation of the hysteresis effect under the standard Marshallian theory[7]. Under the option pricing theory[8], other factors besides previous exporting experience and current price (current exchange rate) affect current market participation. Under this approach, companies choose among different alternatives upon expected net present value of future cash inflows

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[7] More in Baldwin (1988) and Baldwin and Krugman (1989)

and outflows of each alternative, which are governed by stochastic processes, where they take into consideration all the variables that affect the net present value (NPV).

Under the standard theory, a company decides to enter if price P exceeds entry value P_H (if the NPV of this alternative is positive). Under the option theory, if current price P equals entry price P_H, the company will not enter because it can do better by waiting. In reality, price changes are affected by numerous factors, where many of them are stochastic in nature. In explaining why the company is better off waiting, we have to analyze different scenarios of future developments. In the most simple scenario, assume that only changes can come through changes in price where for the sake of simplicity both possibilities are equally likely. Meaning, that price can either increase or decrease in the future with a probability of one half. The NPV of entering option when price P equals entry price P_H is obviously 0. On the other hand, the option of not entering is more attractive. Namely, if the price falls in the future, a company will not enter, where the NPV of this option is 0; but if it rises, a company can enter and have positive economic profit since inflows exceed sum of operating and cost of capital. Since both possibilities are equally likely (with probability one half) the NPV of the non-entering option, which is an equally weighted sum of the two possibilities of price movement, is positive.

The NPV of the non-entering option is higher than the NPV of the entering option. Due to that, a price that triggers entry under the option theory is higher then under the standard explanation of hysteresis effect. A question that arises is: why should a company enter at all if it can only gain by waiting? When analyzing the NPV of the non-entering option, we have to consider that company also looses by not entering, since it sacrifices current exporting profits in the case when revenues exceed the sum of operating costs and cost of capital. Eventually for some higher price P (bigger then P_H), the sacrifice of current profits becomes more important and the company decides to enter. Under the option theory, the entry price is thus higher then under the standard approach.

More generally the participation condition can be written as:

[6] $?_{it}(Y_{it} ? 1) ? F_i^0 (1 ? Y_{i,t?1}) ? ?_{it}(Y_{it} ? 0)$

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[8] As in Dixit (1989), Robrts and Tybout (1997), Das et al. (2001)

where $\pi_{it}(Y_{it}=1)$ represent expected gross profits of the entering option in period t, $\pi_{it}(Y_{it}=0)$ gross exporting profits of the non-entering option in period t, and $F_i^0(1-Y_{i,t-1})$ the sunk costs of entry (if the company is not yet present).

From equation (6), one can implicitly assume that entry cost are the same for new companies (those that were never present in that market) and companies with previous exporting experience in that market. In equation (6), we thus ignore the possibility that entry cost may depend on company's exporting history dating back further than just one year.

Due to the fact, that entry cost are composed of start up cost of establishing distribution channels, brand name etc, it is reasonable to assume that the entry cost in the case where a company is returning to the market are lower than if the company had never been there before. If we allow past exporting history to influence current exporting status, we must include another term into equation (6):

[7] $$\pi_{it}(Y_{it}=1)-\pi_{it}(Y_{it}=0)-F_i^0 \cdot (1-Y_{i,t-1})-\sum_{j=2}^{?} (F_i^j - F_i^0)\tilde{Y}_{i,t-j}$$

Equation (7) resembles equation (6), the only difference being in the added term (last term equation 7), which captures the effects of past exporting experience. Here $\tilde{Y}_{i,t-j}$ summarizes company's most recent exporting experience ($\tilde{Y}_{i,t-j}$ is 1 if a company was last in export market J years ago and zero otherwise) and F_i^j are the according sunk costs of entry. The current exporting status can thus be written as:

[8] $$Y_{it} = \begin{cases} 1.......\pi_{it}(Y_{it}=1)-\pi_{it}(Y_{it}=0)-F_i^0(1-Y_{i,t-1})-\sum_{j=2}^{J_i}(F_i^j - F_i^0)\tilde{Y}_{i,t-j} \geq 0 \\ 0......otherwise \end{cases}$$

There are two ways we may precede in estimating equation (8). We could develop a structural model of export participation that would be based on specific assumptions. Alternatively we can approximate $\pi_{it}(Y_{it}=1)-\pi_{it}(Y_{it}=0)-F_i^0$ as a reduced form expression of company characteristics and time-specific effects that reflects changes in business environment. Because a great number of approximations

(which limit the applicability of the model) are required for the development of structural model, and since we are not interested in the exact values of correlation coefficient but only in the signs of correlation coefficients (positive or negative), we use the reduced form equation. As mentioned, we assume that the difference in expected gross profits of the two possible options is a function of company's specific characteristics Z_{it}, changes in business conditions $?_t$ that are common to all firms and error term $?_{it}$:

. [9] $?_{it}(Y_{it} ? 1) ? ?_{it}(Y_{it} ? 0) ? F_i^0 ? ?_t ? ? ?Z_{it} ? ?_{it}$

Substituting equation (9) into (8)

[10] $Y_{it} ? \begin{cases} 1........?_t ? ? ? ?Z_{it} ? F_i^0 ?Y_{i,t?1} ? \sum_{j?2}^{J_i} (F_i^j ? F_i^0)\tilde{Y}_{i,t?j} ? ?_{it} ? 0 \\ 0......otherwise \end{cases}$

In order to identify the model, we must make additional restrictions. Firstly we assume that companies that have not exported for more then two years face the same entry cost. Secondly, we assume that the entry costs are equal for all companies ($F_i^j ? c_j$). Applying the two assumptions brings us to a simplified version of equation (10):

[11] $Y_{it} ? \begin{cases} 1....ce. ? ?Z_{it} ? b_{i2} ??_t ? c_1 ?Y_{i,t?1} ? c_2 ?(1 ? Y_{i,t?1})Y_{i,t?2} ? c_3 ?Y_{i,1990} ? ?_{i,t} ? 0 \\ 0....otherwise \end{cases}$

Another term that was included in equation (11) is $Y_{i,1990}$ (we will refer to this variable as pp90), a binary variable that takes value 1 if a company was present on a given market before 1991 and zero otherwise. In most cases, Slovenian companies have been active on markets of EU, Russia and Yugoslavia even before 1991. Positive values of coefficient pp90 can thus indicate that companies present on a given market

are mainly those that were present there before 1991. It can also mean that the presence of the company is to great extent determined by investments conducted before 1991. Alternatively, can the persistence of companies on a given market be explained by unobservable characteristics of companies that are not necessarily linked to sunk cost.

Before moving on to estimation and results, we discuss our data set and export patterns of Slovene companies.

2.2. Variable statistics and data sample

2.2.1. Nonrandom samples

We evaluate the effect of sunk costs on the export decisions of Slovene firms on the export markets on a panel of approximately 160 large and medium Slovene firms. The sample represent 32% of Slovenian export revenues in year 2000, 18,9 % of all employees, 25% of profits and 8% of balance sheet capital. The sample is none-random. Despite that, we believe, that our sample is relevant for analyzing the effects of sunk costs on export participation of Slovene firms, since it contains core firms of Slovene economy.

The panel contains data from publicly available information, such as balance sheet, income statement etc, and non-publicly available information (export revenues on different markets, investments in physical capital…), which were obtained via a questionnaire. For some firms we were unable to obtain all the data, mainly the data about export participation and value of the revenues in exporting markets before 1996. Also some firms were created in the observed period. As a result the number of firms that have complete data on share of revenues to different markets in the period 1992-2001 is a bit smaller (110 firms). In the period 1996-2001, the number of firms with complete data is bigger (155 firms). The latest data set contains also the firm heterogeneity data (i.e. ownership structure...). Namely the privatization process was finished in a year 1995. For 112 firms out of 155, we were able also to obtain the credit rating information from Nova Ljubljanska Bank. In table 1 we show summary statistics and standard deviations of the variables that are used in our analysis. They are presented for three samples of firms explained above.

According to the classification of SURS firms are classified in five groups of industries: 1) food and beverages; 2) chemical, oil and rubber products; 3) metal, electrical and optical industry; 4) retail, wholesale and 5) miscellaneous.

2.2.2. Entry and exit

First we show entry and exit dynamics of Slovene firms to different export markets (EU, Russia and countries of former Yugoslavia). In table 2 and 3 we present number of entering and exiting firms by year for different markets.

Several conclusions can be drawn from tables 2 and 3. Fist, majority of Slovene firms were present in EU markets even before Slovenia declared its independence (1991). Out of 155 firms, 65% were operating in EU markets already in year 1990. In year 2001 this share was 77%. A bit more than 30 firms did not enter to EU market in observed period 1992-2001. The entry to EU market was more heavily present at the beginning of nineties (especially in the year 1992), while there is basically no exit from the EU markets. Second, Russian market is very volatile for Slovene firms. Entry of firms to Russian market were more common at the beginning of nineties and at the end on nineties and especially in years 2000-2001, while majority of exit happened in the period of the Russian crisis (1998-1999). Third, the participation of Slovene firms on markets of the former Yugoslavia was highest before 1990. Namely 73% of the firms (out of observed 155) were present in these market also in year 2001. Immediately after Slovenia declared its independence, the number of Slovene firms present in the former YU market declined. The exit was the biggest in BIH and FRY. Also a lot of firms exited from the Croatia and Macedonia at this period. The biggest entry to former YU markets happened in year 1996. That is probably the consequences of the Dayton agreement. While the entry after year 1996 is pretty stable in the Croatia and BIH, the FRY and Macedonia show cyclical movements that can be explained with political situation in these countries. In last two years, Slovene firms started to enter the FRY markets on a bigger scale.

Among the firms who exported to EU at least once , 91.4% of them (longer time period sample) and 94.4% (shorter time period sample) were permanently present in EU market. Among the firms who changed their exporting status in EU markets has done that basically once (80% of firms in long time period sample and 83.4% of firms in short time period sample). On other markets the positive trend of

export participation is less present. For the Russia, among the firms that exported to it at least once, 34.6% and 48.7% were permanently present in its market in long and short time period sample, respectively. For the Croatia, BIH, FRY and Macedonia corresponding numbers are 56.9%, 73.8% and 16.3%, 70.4% and 12.8%, 38.3% and 33.3%, 85%, respectively.

The data about the share of firms that changed their exporting status more than once also provide useful information about export participation variability. For the Croatia, BIH, FRY Macedonia and Russia the numbers for longer time period are 50%, 46.3%, 48.8% 40% and 41%, respectively, while corresponding numbers for short time period are 25%, 29.3%, 37.8% 60% and 15%, respectively.

2.2.3. Description of the variables

Since the long time sample contains less data than the short time sample our analysis will be mainly based on the later sample. The data in table 1 show, that firms that contain also information about their credit rating[9] are bigger and more export oriented compared to firms in the full short time period sample. This is not surprising since one of the main activities of the banks is financing export activities of the firms. Since we will use the credit rating information only in the last part of our analysis, the below description of variables corresponds to the full short time period sample (1996-2001).

The average firm has 544 employees, its coefficient of sales in fixed assets is 2.07. The average firm makes 59.7% of all revenues makes in domestic (Slovene) market. The share of labor costs in value added[10] is 71%, the share of short-term liabilities in total liabilities and shareholder's equity is 30%.

In graph 1 and 2 we show average value of revenues (only for firms that export to given market is positive) by years. As evident from graphs, average revenues are highest for Slovene market, as it is to be expected, whereas the export revenues are highest for the EU markets. Average revenues in EU grew for the whole period. The increase in the revenues is 37%. Russia exhibits great variability of the export revenues, where the whole period is marked by a significant decline in 1999.

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[9] Credit rating information of firms were provided by Nova Ljubljanska Bank.
[10] We have calculated value added as labor costs plus amortization plus (minus) profit (loss).

The fall of revenues in 1999 coincides with the Russian crisis. As a consequence, the real revenues in year 2001 are smaller than in year 1996. Revenues in countries of the former Yugoslavia exhibit high growth rates for the whole period, which is a natural consequence of political stabilization after 1996. The highest increase in revenues (in relative terms) is present for the BIH. Interestingly in year 2001 average revenues of companies exporting to the BIH surpass average revenues of companies exporting to the Croatia. However average exporting revenues to the Croatia are very stable. Also number of Slovene firms exporting to Croatia is bigger as to BIH. Hence the Croatia is the most important market from the region of the former Yugoslavia.   Also the average value of exports to FRY is always increasing in observed period.. The only region with decline of export revenues in a given year is Macedonia, in period 2000-2001. Fall in revenues coincides with increased political tension in this same period.

The labor costs remain between years 1996 and 2000 mainly constant. They have increased in year 2001. As a result the labor costs increase in observed period only by 2%. Also the fixed assets basically do not exhibit any positive trend. The decline of fixed assets in years 1996 and 1997 is followed by the growth. The only variable that exhibits permanent decline is the average number of employees. In observed period the employment decreased by 9%.

Looking at the variables that measure the ownership structure we see that the share of the insiders (workers, managers, former employees) has declined from 38.73% in year 1996 to 25.32% in year 2001. There was also a decline in share of the investment and government funds from 38.88% in year 1996 to 31.79% in year 2001. On the other side, the power of small shareholders and other firms have increased. The ownership share of other firms increased from 9.29% to 28.68% and the ownership share of small shareholders increased from 13.69% to 14.37%. The increase of the ownership share of other firms is a result of takeovers, while the increase of the mall shareholders can be explained by an open market operations on the stock exchange. The average share of the nternal members of supervisory boards is declining over the whole period (54.93% in year 1996, 44.70% in year 2001).

The average share of top executives in all employees has increased from 2.42% in year 1996 to 2.66% in year 2001. In the same period the share of managers with seventh or higher level education have increased from 61.25% to 71.46%. On the other side, the share of replaced managers that was around 6% at the beginning of period reached its peak at 9.22% in year 1997 and then declined substantially in years

2001 and 2001 (to around 1%). It seems that after privatization most of the firms changed their managers. After that, the process of replacement settled down. The average age of chief executive is 50 years and on this position is on average already 9 years.

2.3. Econometric results

2.3.1 A reduced form equation

Deriving from the model, we can represent firm's presence in a given export market (Y_{it}) as a function of company's previous exporting history (sunk costs), company heterogeneity or observable firm differences and changes in export conditions.

The effect of sunk cost is summarized by variables $Y_{i,t?1}$, $Y_{i,t?2}/Y_{i,t?1}$. $Y_{i,t?1}$ is a binary variable that takes value 1 if the company was present in a given export market in thw last year and 0 if it was not. Similarly $Y_{i,t?2}/Y_{i,t?1}$ measures the effect of a lagged firm's presence, but only if a company was absent from the time that the firm was last present two years. If it takes value 1, the firm was not present in the last year but two years ago, and 0 otherwise. We expect positive dependence, due to smaller asymmetry of information of previously present firms and better recognition of firm and their products because of previous participation, between both coefficients that summarize the effects of sunk costs and current market participation Y_{it}.

Variable pp90 measures to what extent the firm's current presence is determined (affected) by the firm's exporting status before the breakup. Therefore, this variable could also be an indirect measure of the effect of sunk costs. We expect the coefficient that measure the effect of pp90 to be positive.

For measuring observable firm differences we included the following variables: number of employees in previous year *laborl* (proxy for firm size), lagged wages w*l*, firm's legal status *dd* (binary variable that takes value 1 if it is a joint-stock company and 0 if it is a limited liability company), LS2 (the percentage of a given firm's shares that are owned by the state and investment funds), *LS3* (share of other

companies), *LS4* (miscellaneous owners)[11], structure of supervisory board **NS2** (share of internal owners in supervisory board) and various variables that measure management characteristics (*e11* measures share of managers in total number of employees, *e13* share of managers with educational level VII or higher, *e4m* percentage share of replaced managers, *e51* general managers' age, *e52* working years as a general manager), type of industry **I₁** (beverages and food industry served as a basis). To isolate the effects of yearly variations in the business environment (e.g. exchange rate[12], relative prices, trade agreements, political situation..) we included yearly dummies D_y).

The reduced function to be estimated is the following:

[12]

$Y_{i,t} = ?(Y_{i,t?1}, Y_{i,t?2}, pp_{90}, \text{lnlabor1}, \text{lnw1}, e11, e13, e4, e51, e52, LS2, LS3, LS4, NS2, dd, Ip, DY)$

$+ \quad + \quad + \quad + \quad + \quad + \quad + \quad - \quad + \quad + \quad + \quad + \quad + \quad +$

The signs below the equation indicate the expected relationships between the dependent and independent variables. As mentioned earlier we expect past presence to have a positive effect on current market participation. We also expect that larger companies will find it easier to do business abroad and be more competitive due to economies of scale. Similarly we expect that companies that pay higher wages are more competitive in outside markets. It is more likely that a company will be present if it has an experienced manager and well educated management team (Domadenik et. al., 2000, Prašnikar et. al., 2002). Regarding joint stock companies, we expect that to have a positive effect on companies presence on a given export market. the same applies for companies with a higher share of outside owners and a higher share of outside members in the supervisory board (Frydman et. al., 1999, Murrell and

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[11] The miscellaneous owner category does not include the percentage of shares owned by insiders (workers, managers and retired workers, *LS1*) because this share of ownership is treated as the base, captured in the regression constant, against which the effects of other forms of ownership are being estimated.

[12] The exchange rate is not explicitly included in our model. This is a consequence of two factors. Firstly, inclusion of yearly dummies excludes inclusion of exchange rate due to co-linearity. Due to the fact that political tensions are more significant for countries under observation we decided to include yearly dummies that better describe this effects. Secondly, export decisions of companies depend on export prices that are not in one-to-one correspondence with exchange rate (i.e. depend also on other factors). The effects of relative prices are to some extent taken into account with the inclusion of industry dummies and yearly dummies.

Djankov 2001, Prašnikar and Gregoric, 2002). For other variables, predicted signs are difficult to determine.

2.3.2. Empirical Results

Estimation of the participation equation (12) is given in tables 4 and 5. They are based on pooled probit estimation[13]. The reported standard errors (given in parentheses) are based on White (1982) method. Due to the missing variables in longer time period sample, results in table 5 only complement results in table 4 with shorter time period sample.

The effect of past exporting experience on current exporting status is summarized by values in first three rows. Focusing first on the coefficient Y_{t-1}, we find that the last year's exporting status has a strong positive effect on probability of exporting in current year. As expected the probability that a company exports in current year if it last exported two years ago is lower but still significant. Using Wald's test, we can reject the hypothesis that both coefficients are jointly equal to zero. The effect of past experience on entry cost deteriorates with time[14] for all areas except for EU, where due to lack of data, variable Y_{t-2}/ Y_{t-1} was not included. As mentioned earlier companies did not step down from EU market after 1996.

In most equations (except Russia) coefficient on pp90 is positive and significant, which indicates that presence in the markets before 1990 significantly affects the probability of exporting in the current period. The coefficient on pp90 is also significant in the longer period (1992-2001). Although the values of coefficient

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[13] Under the assumption that error term ($?_{it}$) is normally distributed, the equation (11) can be estimated with pooled probit model (Greene, 2002). However in our case a more reasonable assumption is that the error term ($?_{it}$) is the sum of permanent, plant specific component,$?_I$, and residual, $?_{it}$ (i.e. companies differ in their inclination towards export markets). This leads to inconsistency of parameters when using simple estimation technique regardless on the assumption made about behavior of $?_{it}$ (independently distributed or serially correlated). The consistency of parameter estimation in dynamic non-linear models with unobserved heterogeneity depends heavily on specification of initial conditions. Solving this problem is far more difficult in non-linear models then in linear models since there doesn't exist a general transformation that would eliminate unobserved heterogeneity and lead into useful moment conditions. The above problem can be solved with Heckman (1981a, 1981b) and/or Wooldridge (2000) approach. In table A1 we compare results of pooled probit and Wooldridge approach.(We ignore the sunk cost connected with the variable pp90). Results show that sunk costs are still important when properly controlling (by Wooldridge approach) the structure of error term. However as expected, the marginal effects are smaller (but still positive) as in pooled probit estimations.

[14] Exporting experience for more than two years was not included due to small numbers of examples of companies that returned to the market after more then two years' absence.

on pp90 are still significant when it comes to states of former Yugoslavia and Russia, they are considerably smaller then in the case of EU markets. The EU markets stand out as the most important markets for Slovenian companies. Once the company enters into EU market it rarely ever exits. It is hard to determine whether this is consequence of very large sunk cost of entry and exit or a consequence of some other factor due to small variability of export presence in the sample. It is, therefore, possible that companies persist in the EU markets despite unsatisfactory results (distressed exports)[15].

The next group of coefficients summarizes the effects of specific company characteristics on export participation. Size of company matters when it comes to markets of Russia and FRY (both short and long term sample). It matters also in the market of BIH if we only look at the results of longer time period 1992-2001. It seems that these markets are more risky and that larger companies diversify risk easier. As mentioned earlier, the number of variables that are included in the model is different for short and long samples. Therefore, it may happen that the results on coefficients of variables differ among long and short sample. For example, when we include into our model of export participation on markets of EU variable legal status of company, the sign of the coefficient on size changes from positive and nearly significant to negative and significant. It seems that the change in sign of coefficient is connected to the entrance of smaller companies (mainly limited liability companies). Most of these companies were formed after 1990, due to breakup of larger companies and takeovers. These smaller companies are oriented mainly to EU markets and are thus more affected by crisis on these markets than large companies.

The ownership variables and the structure of supervisory board do not seem to influence companies export participation (the exception is EU market where external ownership is more important than internal one). The results also show that motivation of employees is not an important factor in explaining export participation. It also seems that no type of industry is more present in exports markets, except for companies forming fifth group (miscellaneous). The sign of industry dummy for that group is negative for all markets, however it is significant only for markets of EU, BIH and Croatia.

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[15] We test the effect of export participation on company's financial stability in following section

We expected that management characteristics would play a more significant role in explaining export participation. variable. The variable *e13* (share of managers with educational level VII or higher) is positive and significant in the market of BIH. The variable *e4m* (percentage share of replaced managers) is positive and significant for the markets of EU and negative and significant in Russian market. The coefficient of variable *e52* (working years as a general manager) is positive and significant in EU market

If we focus on the impact of changes in business environment on export participation, following conclusions can be drawn. Some of the variables that were included in analysis of shorter sample were not included due to lack of data in the longer sample (1992-2001). This is the main reason why the results of the coefficients on time dummies in longer and shorter sample should be treated differently, since obviously due to smaller number of variables in longer sample time dummies will represents other events besides changes in business environment (e.g. appearance of limited liability companies after privatization in 1996). Values of coefficients of time dummies in shorter sample indicate the start of the recession in 2001 on EU markets, while in the longer sample the values of the time dummies coefficients don not indicate such a crisis. Although we should be careful in explaining signs of the coefficients on the time dummies in the longer sample, they correctly indicate the presence of the crisis in former Yugoslavia in beginning of 90.

Besides recession in 2001 in EU markets, other important changes in business environment can be noted. Results of probit analysis on shorter sample for Russia, FRY and Macedonia are especially indicative. The probability that a company is present on Russian market is significantly lower in 1997 compared to 2001. This coincides with Russian crisis that began later that year and peaked in 1998 (the coefficient on time dummy 98 is also negative but insignificant). Similarly for the FRY, negative and significant values on dummies 97 and 99 indicate well-known events that took place in that period (value of coefficient on dummy 98 is also negative and almost significant). Due to the high risks linked to political turmoil that reached its peak in 1999, Slovenian companies found this market to be unattractive. In contrast to the FRY, the value of the coefficient on the time dummy 1999 is positive and significant for the Macedonian market. Due to the military intervention, Slovenian companies exported to FRY from Macedonia.

2.4. Conclusion

We can conclude that hysteresis is an important factor in explaining the export participation of Slovene firms. This is especially true for the EU markets. The results also show that the variables that measure heterogeneity of firms are not very important in explaining export participation of Slovene firms. Macroeconomic and political stability of former Yugoslav countries and Russia are very important in explaining export dynamics of Slovene firms. Probably these markets are very risky and firms' behavior accounts for that fact. The nice example is Croatia. Besides EU markets, this market was for Slovene firms the most stable one. Most of our firms were present in Croatia already before 1991. However the average export to Croatia does not increase over "safe" level. It seems, that due to high risk firms form a kind of "security" limit.

3. Export to EU and the financial success

3.1. Exit costs as a reason for persistence of Slovene firms in EU markets

In the previous section we have shown that the markets of EU are the main exporting markets for Slovene firms. When a firm enters into that markets usually does not exit. Besides the entry costs, the key role play also the exit costs. Exist costs consist of the switching costs (costs of replacing stable buyers with new ones) and the costs of reducing the production (compensation money for excess workers) when firm is not able to replace old customers with new ones. Firms that are heavily dependent from sales in EU markets, where the competition is severe and the possibility of charging the price above marginal cost is small, remain in the EU markets despite the fact, that they hardly cover the variable costs. It is even possible, that occasionally the price falls below the variable costs but the firm does not exit from that market.. This is more likely to happen if the absorption power of the markets (growth rate of EU markets) declines. Above is more likely to happen for a firm that pursues the strategy of cost efficiency. Due to being small, Slovene firms have can not take the advantage

of the economy of scale. If they operate in the simple phase in a chain of the value added creation, their situation is even more severe.[16] Above description allows us to make the following hypothesis:

H1: *The financial success of a firm is negatively related with the share of revenues that a firm makes in the EU markets.*

H2: *The financial success of a firm is negatively related with the absorption power (growth rate) of the EU markets.*

H3: *The financial success of the firm is smaller if the firm is operating in the simple phase in the chain of a value added creation.*

All above hypothesis are related with the size of the exit costs. The exit costs of the firms that create most of its revenues in the EU markets are high due to high cost of replacing their customers. If the growth rate of EU markets decline and the firms are unable to find new, more profitable markets, they face problems, since they are confronted with excess workers (compensation money). Similar problems face firms that are operating in the simple phase in the chain of the value added creation. Hence the high exit costs increases probability that the firms remain in the EU markets despite the declines in prices and profits.

We will test above hypothesis in a similar manner as we have tested the existence of sunk cost in previous section. We can write the exit condition for a firm in a similar manner as entry condition that is given in (6). The only difference is that we replace entry cost with exit costs:

[13] $?_{it}(Y_{it} ? 1) ? ?_{it}(Y_{it} ? 0) ? ?E_{it}.$

The firm remains in the exporting market as long as the expected loss (the difference between staying in the market Y=1 and exiting Y=0) in this market is smaller as the exit costs (E).

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[16] For Slovene firms more suitable is the strategy of differentiated products and services and satisfying

Based on above discussion, the exit costs from the EU markets can be written as:

$$[14] \quad E_{it} \ ? \ V_{it} \ ?(a_1 \ ?s_{EUit} \ ? \ a_2 \ ?g_t \ ? \ a_3 \ ?w_{it} \ ? \ \sum_j \dot{a}'_4 \ ?\dot{I}_{ij}) \ ? \ ?_{it}$$

where we have assumed that the exit costs are proportional to the size of the firm (V). The size of exit costs depends on the share of revenues created in the EU markets (s_{EU} = revenues in EU/all revenues), growth rate of EU economy (g) and the share of labor costs in the value added (w).

Following the procedure in section 2.1. and using the fact that in reduced form equation the difference between being in a given market or not depends on macroeconomic factors, characteristics of the firm and on the error term, the equation (9) can be rewritten as:

$$[15] \quad ?_{it}(Y_{it} \ ? \ 1) \ ? \ ?_{it}(Y_{it} \ ? \ 0) \ ? \ ?_t \ ? \ \dot{?} \ ?\dot{Z}_{it} \ ? \ V_{it} \ ?(a_1 \ ?s_{EUit} \ ? \ a_2 \ ?g_t \ ? \ a_3 \ ?w_{it} \ ? \ \sum_j \dot{a}'_4 \ ?\dot{I}_{ij}) \ ? \ ?_{it}.$$

The variable $?_{it}(Y_{it} \ ? \ 1) \ ? \ ?_{it}(Y_{it} \ ? \ 0)$ is not very suitable for an empirical implementation. However, since it is proportional to the current gross profit d_{it} (look Appendix), it can be replace with:

$$[16] \quad ?_{it}(Y_{it} \ ? \ 1) \ ? \ ?_{it}(Y_{it} \ ? \ 0) \ ? \ d_{it}$$

This allows us to write (15) as:

$$[17] \quad d_{it} \ ? \ ?_t \ ? \ \dot{?} \ ?\dot{Z}_{it} \ ? \ V_{it} \ ?(a_1 \ ?s_{EUit} \ ? \ a_2 \ ?g_t \ ? \ a_3 \ ?w_{it} \ ? \ \sum_j \dot{a}'_4 \ ?\dot{I}_{ij}) \ ? \ ?_{it}$$

If we divide both sides with the variable that captures the size of the firm, we get:

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market niches (Pucko, 2002).

[18] $\quad \dfrac{d_{it}}{V_{it}} ? ?_t ? ? ?\dot{Z}_{it}^{'} ? (a_1 ?s_{EUit} ? a_2 ?g_t ? a_3 ?w_{it} ? ? \displaystyle\sum_j \dot{a}_4 ?\dot{I}_{ij}) ? ?_{it}$

Described procedure is very general. The exact equation used in the empirical implementation is given in the next section.

3.2 Estimation of the financial success equation

For an empirical implementation we write equation (18) as:

[19] $\quad$ B09fa = b_0 + b_1 peu_{it} + b_2 $absEU_{it}$ + b_3 $peuabsEU_{it}$ + b_4 $dLCvVA_{it}$

$\quad$ + b_5 $e11_{it}$ + b_6 $e13_{it}$ + b_7 $e4m_{it}$ + b_8 $e51_{it}$ + b_9 $e52_{it}$ + b_{10} $LS2_{it}$ + b_{11}

$\quad$ $LS3_{it}$ + b_{12} $LS4_{it}$ + b_{13} $NS2_{it}$ + b_{14} dd_{it} + $b_{15}PANOGA_i$ + $?_{it}$,.

where the independent variable (B09fa) is a cash flow (B06) divided by the fixed assets (fa).[17] The independent variables are share of sales in EU (*peu*)[18], *absEU* measures the growth rate of the German economy, *peuabsEU=absEU*peu* and the variable *DLCvVA*, which measures the labor costs in the value added. The variable *e11* measures share of managers in total employment, *e13* is the share of managers with educational level VII or higher, the variable *e4m* is the share of replaced managers, *e51* is the age of chief executive and the variable *e52* measures how many year was the chief executive at this position. The variables *LS2, LS3* and *LS4* measure an ownership structure. The variable *LS2* measures an ownership share of the investment and government funds, *LS3* measures an ownership share of the other firms and *LS4* is the ownership share of other owners. The *LS4* does not include the inside owners (workers, mangers, former employees). The inside owners serve namely as a base (*LS1*). The variable *NS2* measures the share of external members in supervisory board, while *dd* is a dummy variable that has a value 1 if the firm is a joint stock company.

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[17] The fixed assets serve as a proxy for the size of the firm. One reason for taking the fixed assets instead of revenues is that it eliminates the influence of cyclicality of an economy. However, there is also another reason. The variable B09fa is also an important from the lender (bank) view. Namely, bank is using this variable to determine the credit rating of a firm. More detailed discussion is given in section 3.3.

Equation (19) contains following key hypothesis about the financial success of firms:

H1: The financial success of the firm is negatively related with the share of revenues that a firm makes in the EU markets (b_1 ? 0)

H2: The financial success of the firm is negatively related with the growth rate of the EU markets (b_2 ? 0 & b_3 ? 0).

H3: The financial success of the firm is negatively related with the share of labor costs in value added ($b_4 < 0$).

H4: The financial success of the firm that has higher share of mangers in total employment is
a) higher as in firms with a smaller share of mangers (b_5 ? 0) or
b) equal ($b_5 = 0$).

H5: The financial success of the firm that has higher share of mangers with educational level VII or higher is
a) higher as in firms with a smaller share of mangers (b_6 ? 0) or
b) equal ($b_6 = 0$).

H6: The financial success of the firm that has a higher share of the replaced managers is
a) smaller as in firms with a smaller share of replaced mangers ($b_7 < 0$) or
b) equal ($b_7 = 0$).

H7: The financial success of the firm that general managers are older is
a) higher as in firms that have younger general manager (b_8 ? 0) or
b) equal ($b_8 = 0$).

H8: The financial success of the firm whose general managers has been in this position for a long time is
a) higher as in firms with "short time" general manager (b_9 ? 0) or
b) equal ($b_9 = 0$).

H9: The financial success of the firm that has a bigger share of outside owners is compared to firms with inside ownership
a) higher (b_{10} ? 0 and/or b_{11} ? 0 and/or b_{12}? 0) or
b) equal ($b_{10} = 0$).

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[18] Germany is the most importing market for Slovene economy.

H10: The financial success of the firm that has a bigger share of external supervisors is

a) higher as in firms with higer share of internal supervisors (b_{13} ? 0) or

b) equal (b_{13} = 0).

H11: The financial success of the joint stock companies is

a) higher(b_{14} ? 0) or

b) equal (b_{14} = 0).

The table 6 contains the results of the equation (19). The results support the hypothesis *H1-H3*. The coefficient b_l is positive and statistically significant. Hence there is negative relationship between financial success of the firm and the share of exports to EU. Variable *absEU* is not statistically significant. However variable *peuabsEU* has the correct sign (b_3? 0) and is also statistically significant. The share of labor costs in value added has a negative impact on *B09fa* (b_4? 0) but is not statistically significant.

Among the variables that measure the influence of managers on financial success of the firm, the variable *e4m* is negative and very statistically significant. Higher the share of replaced managers, less successful the firm is. The coefficient of variable *e11* (share of managers in total employment) is also negative and statistically significant at 10% level. This could imply that to many managers could lead to managerial slack. Other variables that measure influence on managers are not statistically significant.

Hypothesis *H9a* is not supported by our data. Also we do not find support for hypothesis *H10a* and *H11a*.

We can conclude that exit costs are an important factor for explaining the persistence of Slovene firms in the EU markets. If the firm is heavily focused on EU markets, it has a higher exit costs (cost of replacement). Hence, the firm does not exit from the EU markets even if this worsens their financial position. This is especially true in case of the decline of absorption power in the EU markets.

3.3. Expected solvency of firms

We have shown that due to high exit costs Slovene firms do not exit from EU markets even if this worsens their financial position and leads to losses. On long range this policy would lead to the bankruptcy. However, on short range the firm can overcome above problem with incurring debts. The firm can take loans form their suppliers,[19] banks or on a black market. Taking loans form suppliers is connected with the interest of suppliers that their merchandise is "sold". However sooner or later the bills are paid with such delay or are unpaid that suppliers are not willing to sell their products any more. Since it is currently almost impossible for unsuccessful firms to get loans in black market, the loans from banks are of vital importance.

Bank of Slovenia requires from banks that they monitor and estimate credit risks that they face very carefully at pursuing their activities. As a results banks rank their customers and their claims into five groups A-E. Group A consist of bank customers (firms), for which is expected that they will not have problems with repaying loans. In group B are firms that are currently in a weak financial position and often repay loans with delay. In group C are firms that do not have enough long term resources for financing investments. Also banks do not get from them enough information and adequate documentation about their debts. Group D consists of firms that are not liquid or are insolvent. It is likely that such firms will not be able to repay loans. In group E are firms that are not able to pay their obligations. Hence banks are ranking firms according to their expected solvency. Firms with the credit rating A and B are "normal" customers, while with firms in group C or lower, banks transact only in special occasions.

We have tested the hypothesis of persistence of Slovene firms in EU markets due to high exit costs also with the expected solvency of the firms, which is based on the credit rating information.

Out of a full sample of 155 firms in a period 1996-2001, we were able to obtain for 112 firms their credit rating information. The quarterly credit rating information were collected from the Nova Ljubljanska Bank.[20] In the analysis we have use the credit rating information on 1st of April of current year. The credit rating

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[19] Taking loans from suppliers and not paying the bills is the common strategy used by Slovene firms. This is especially true for the firms which have adequate market power (Prašnikar et. al., 2002)

[20] Only 112 firms gave us the permission to collect their credit rating from the Nova Ljubljanska Bank.

was used as dependent variable. To firms with credit rating A we assigned value 2, to firms with credit rating B value 1 was assigned, to other firms we assigned value 0. Independent variables are the cash flow in fixed assets (B09fa), the share of short range liabilites in total liabilites and shareholder's equity liabilites (D32v36) and the firm characteristic variables (variables that measure managers influence: e11, e13, e4m, e51 and e52; variables that measure ownership structure and structure of the supervisory board: LS2, LS3, LS4 NS2; variable that measure legal status (dd) and industry dummies).The variable pure cash flow reflects the most general measure of credit ranking of the firms. It reflects the ability of firms to repay their obligations. We have normalized the variable cash flow with fixed assets since the banks generally tie up the ability to repay loans with the size of mortgage insurance that is linked with the value of fixed assets. The variable D32v36 reflects the short-term indebtedness of a firm that is usually used as an alternative measure for rating of firms.

We have estimated the relationship between credit rating and independent variables with random effect ordered probit model.[21]The estimator takes into account: (1) that dependent variable has an ordinal meaning. In our case the variable credit rating takes values 0,1 and 2. The firms with the highest credit rating (A) have value 2, firms with credit rating B have value 1 and for the other firms the value of credit rating is 0. The fact that value 2 reflects the higher credit rating as value 1 contains useful information despite the fact that the variable credit rating has only ordinal meaning; (2) the panel structure of the data, where the error term ($?_{it}$) is the sum of the plant specific component ($?_i$) and the residual ($?_{it}$). The results of the expected solvency of the firms are given in table 7.

From table 7 we can see that the coefficient of the cash flow in fixed assets (*B09fa*) has a positive sign and is highly statistically significant. The firms with higher value of cash flow in fixed assets have on average higher credit rating. The coefficient of short term obligations in total liabilities and shareholder's equity (*D32v36*) is negative and also highly significant. The firms with higher value of the variable D32v36 have lower credit rating. Hence both variables have expected signs. For firms that makes most of their revenues in EU at a declining cash flow, is expected that their solvency will decrease. With the decrease in credit rating, firms ability to get bank loans will decrease and/or they will be able to get loans under much stricter

conditions. This will be true even more in the case that the growth rate of EU economy will decline. Also the firms that are more indebted will have bigger problems with getting the loans.

Some manager variables and other variables that reflect the firm's heterogeneity are statistically significant which was not the case in estimation of equation (19). Some of the variables have even the reverse sign. We have to note again that the sample of 112 (out of 155) consists of the firms that that gave us the permission to use their credit rating information. As a result we do not pay to much attention to the signs of the variables that reflect the heterogeneity of the firm. They were include mainly because we wanted to control for heterogeneity in estimating the expected solvency of the firms.

4. Conclusion

To known distortions, that have roots in market failures in domestic markets (none-competitiveness of the none-tradable sector, the distortions in labor markets...) we add the specific behavior of Slovene firms in foreign markets. In comparison with their global competitors their economic power is very small. Their sales depends heavily on a small number of buyers (*truncated firm*).

When firm enters in foreign market needs to cover the entry costs, which later on become sunk. As a result, the entry conditions are different as exit ones. Entry price that needs to cover both the operational and the sunk costs is in case of zero exit cost higher than the exit price that needs to cover only the operational costs. In case of none zero exit cost this price can even fall below the operational cost, while firms do not exit the market.

We have shown that sunk costs are present in the export participation of Slovene firms. Our results also show that when the absorption power of the exporting market declines, firms still trade with their established buyers (hysteresis) despite the fact that due to lower prices their exporting revenues decline. However in case of the unexpected and long-term decline of the absorption power or in case of the unsatisfactory policy that would lead to reduction of competitiveness of the tradable sector, a huge number of firms would exit from foreign markets.

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[21] More about random effect probit model can be found for example in Wooldridge (2002) or Green

The results reveal that firms do not exit from EU markets, which are the most important exporting market for Slovene firms. We show that this can be explained with high exit costs, which consist of switching costs (costs of replacing stable buyers with new ones) and cost of reducing the production (compensation money for excess workers) and high re-entry cost if firms would later on again want to replace more risky South-East European and Russian markets with EU markets.

The results reveal that the firm that makes most of it revenues in EU, remains in that market despite the fact, that this worsens the financial position of it. The results show also that his is especially true in the case of a decline of absorption power in EU i.e. decline in the growth rate of the EU markets. The decline in demand leads to reduction in cash flow and in order to continue production, firms need to take loans. However indebtedness is limited. Banks namely give loans based on expected solvency that can be seen as the credit rating of firms. Our results confirm that credit rating is negatively related with the financial position of the firms. As a result, the negative external shock could be devastating for the exporting part of Slovene economy.

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Tables

Table 1: Descriptive Statistics

Variable	N	1992-2001	N	1996-2001 (all sample)	N	1996-2001 (with credit rating)	Description
RE	1806	8188284 (1.66e+07)	1001	8810353 (1.88e+07)	438	9017324 (1.53e+07)	Revenues
RESlo	1451	5215504 (1.51e+07)	870	5256943 (1.62e+07)	429	3485752 (8238574)	- Slovenia (SLO
Reeu	1448	1976935 (5420480)	870	2257148 (6363765)	429	3228269 (8547197)	- EU
Reru	1438	207997 (1127537)	866	221710,6 (1155786)	430	283950,4 (1223145)	- Russia (RU
Recro	1411	421276,9 (1261911)	860	422607,5 (1299013)	420	493023,1 (1449898)	- Croatia (CRO)
Rebih	1424	183476,3 (949903,8)	868	233071,3 (1162686)	422	202176,7 (605374.5)	- BIH
Refry	1401	100727,5 (576200,5)	854	61163,13 (258130,9)	417	94809,55 (349002,3)	- FRY.
Remac	1418	91846,3 (353819,4)	864	91348,67 (338699,2)	423	134768,3 (421365,6)	- Macedonia (MAC)
FA	/	/	1001	4219108 (7487781)	438	4538606 (7196262)	Fixed assets
W	/	/	1031	2831,58 (1026,23)	438	2994,572 (1114,61)	Labor cost on employee
Labor	/	/	998	544,7375 (726,66)	438	604,5251 (852,6073)	Number of employees
VA			996	2304685 (3850529)	437	2714288 (4322145)	Value Added
Ko	/	/	1001	2509332 (5138870)	438	2628499 (4865101)	Short term liabilities
Ovs	/	/	1001	9121413 (1.72e+07)	438	1.04e+07 (1.80e+07)	Total liabilities and shareholder's equity
Peu	1619	27,92 (30,25)	888	29,73408 (30,92)	429	34,82 (31,13)	Share of revenue s in EU
DLCvVA	/	/	995	0,80 (0,86)	437	0,73 (0,62)	Share of labor costs in value added
D32v36	/	/	1001	0,29 (0,17)	438	0,27 (0,16)	Ko / Ovs
B06	/	/	973	693223 (1931843)	438	949222,6 (2302535)	Cash flow
B09	/	/	973	0,04 (0,23)	438	0,07 (0,22)	Cash flo w in revenues (B06/RE)
B09fa	/	/	972	0,12 (0,24)	438	0,18 (0,25)	B06/FA
LS1	/	/	821	31,56 (24,89)	528	31,93 (25,13)	Share of inside owners
LS2	/	/	824	32,15 (23,77)	531	34,38 (24,50)	Share of investment and government funds
LS3	/	/	824	23,25 (34,35)	531	21,17 (31,82)	Share of other firms and banks
LS4	/	/	818	13,06 (19,56)	525	12,55 (18,76	Share of other owners
NS1	/	/	755	50,72 (19,90)	470	50,27 (19,11)	Share of inside members of supervisory board
e11	/	/	828	2,56 (2,07)	438	2,61 (2,04)	Number of m angers/Labor
e4m	/	/	759	8,90 (17,87)	438	8,53 (17,15)	Share of replaced mangers
e13	/	/	840	63,16 (29,99)	438	65,97 (29,77)	Share of managers with VII or higher education level
e51	/	/	1064	49,62 (8,43)	438	50,10 (8,48)	Age of general manager
e52	/	/	1064	8,45 (6,23)	438	8,25 (5,93)	Number of years in the position of general manager

Table 2: Number of Firms that Entered to Different Exporting Markets

LETA	EU	RU	CRO	BIH	FRY	MAC
1990	5	5	2	2	3	1
1991	8	2	8	7	4	8
1992	12	3	8	1	4	1
1993	7	6	11	6	3	9
1994	5	2	9	13	1	6
1995	4	1	8	9	5	8
1996	7	5	13	22	19	12
1997	4	5	8	11	9	6
1998	2	2	3	4	3	3
1999	5	5	7	9	7	10
2000	5	3	5	8	12	4
2001	0	7	3	3	14	1

Table 3: Number of Firms that Exited from Different Exporting Markets

LETA	EU	RU	CRO	BIH	FRY	MAC
1990	0	3	1	6	9	3
1991	1	4	8	6	15	2
1992	1	0	8	15	13	7
1993	0	0	1	11	9	3
1994	1	3	6	0	2	1
1995	0	0	3	2	2	1
1996	0	3	1	2	1	1
1997	0	1	1	1	10	2
1998	2	1	3	3	1	3
1999	1	4	1	1	4	2
2000	1	0	1	4	3	6
2001	0	3	1	1	5	7

Table 4: Results of Pooled Probit Analysis for the period 1996-2001

	EU	Rusija	Hrvaška	BiH	ZRJ	Makedonija
Y_{t-1}	6,054*	3,721*	3,485*	3,156*	2,466*	3,292*
	(1,253)	(0,346)	(0,266)	(0,231)	(0,205)	(0,267)
$Y_{t-2}/Y_{t-1}=0$		1,730*	1,779*	1,393*	0,852*	1,538*
		(0,554)	(0,459)	(0,683)	(0,327)	(0,440)
pp_{90}	3,805*	0,285	0,537*	0,678*	0,874*	0,794*
	(1,505)	(0,271)	(0,221)	(0,202)	(0,262)	(0,242)
E11	0,159	-0,008	0,039	-0,091	3,476	0,002
	(0,120)	(0,068)	(0,063)	(0,056)	(5,196)	(0,075)
E13	0,007	-0,003	-0,001	0,007*	-0,004	0,001
	(0,008)	(0,003)	(0,004)	(0,003)	(0,003)	(0,004)
e4m	0,018	-0,015*	0,002	-0,003	-0,005	0,010
	(0,011)	(0,007)	(0,005)	(0,006)	(0,005)	(0,005)
E51	-0,030	0,020	-0,024	0,024	0,014	0,005
	(0,042)	(0,015)	(0,021)	(0,019)	(0,012)	(0,013)
E52	0,140*	-0,039	0,052*	0,001	0,005	-0,007
	(0,061)	(0,027)	(0,025)	(0,018)	(0,016)	(0,021)
NS2	0,001	0,004	-0,006	-0,009	0,000	0,005
	(0,010)	(0,009)	(0,005)	(0,005)	(0,006)	(0,006)
LS2	0,102*	0,003	0,021*	0,014*	0,012	0,012
	(0,033)	(0,009)	(0,010)	(0,007)	(0,008)	(0,007)
LS3	0,079*	-0,012	0,018*	0,010	0,004	-0,002
	(0,025)	(0,008)	(0,009)	(0,006)	(0,007)	(0,008)
LS4	0,067*	0,017	0,011	0,016*	0,000	0,005
	(0,028)	(0,009)	(0,010)	(0,007)	(0,007)	(0,006)
_Ipanoga_2	-0,951	0,858*	1,191*	-0,167	-0,062	0,049
	(0,707)	(0,336)	(0,569)	(0,311)	(0,295)	(0,244)
_Ipanoga_3	-0,054	0,709*	-0,107	-0,447	0,131	-0,023
	(1,023)	(0,298)	(0,382)	(0,252)	(0,214)	(0,283)
_Ipanoga_4	-1,972*	//	-0,325	-0,423	-0,759	-0,284
	(0,697)	//	(0,316)	(0,314)	(0,455)	(0,230)
_Ipanoga_5	-2,931*	-0,069	-1,061*	-0,717*	-0,277	-1,489
	(1,080)	(0,328)	(0,385)	(0,307)	(0,300)	(0,786)
_Idd_1	-4,150*	-0,064	-0,735	-0,238	-0,657	-0,509
	(1,473)	(0,681)	(0,604)	(0,415)	(0,544)	(0,614)
lnlaborl	-1,054*	0,409*	0,163	-0,103	0,260*	-0,025
	(0,491)	(0,180)	(0,139)	(0,136)	(0,117)	(0,146)
Lnwl	-1,253	-0,094	-0,520	0,007	0,229	0,027
	(0,751)	(0,228)	(0,486)	(0,238)	(0,173)	(0,171)
DY96	2,799*	-0,714	0,350	0,601	-0,196	0,679*
	(0,990)	(0,626)	(0,344)	(0,325)	(0,291)	(0,338)
DY97	1,360*	-0,917*	0,373	0,347	-0,642*	0,424
	(0,636)	(0,454)	(0,391)	(0,350)	(0,318)	(0,413)
DY98	1,738*	-0,955	-0,089	-0,295	-0,522	0,026
	(0,575)	(0,514)	(0,417)	(0,345)	(0,283)	(0,266)
DY99	0,283	-0,307	0,094	0,506	-0,810*	0,780*
	(0,690)	(0,421)	(0,365)	(0,317)	(0,276)	(0,333)
DY100	1,557*	0,012	0,089	0,342	-0,390	0,053
	(0,647)	(0,372)	(0,370)	(0,331)	(0,268)	(0,306)
_cons	10,459	-4,459*	1,950	-2,676	-5,382*	-3,211*
	(5,668)	(2,013)	(3,517)	(2,165)	(1,675)	(1,586)
$?^{2**}$		119,9	172,8	188,1	145,1	153,4

*Statisticaly significant at 5% level

** Wald test: both coefficient Y_{t-1}, $Y_{t-2}Y_{t-1}$ are jointly equal to 0.

Table 5: Results of Pooled Probit Analysis for period 1992-2001

	EU	RU	CRO	BiH	FRY	MAC
Y_{t-1}	4,136*	3,423*	3,335*	3,046*	2,488*	3,294*
	(0,389)	(0,193)	(0,175)	(0,167)	(0,156)	(0,195)
$Y_{t-2}/Y_{t-1}=0$	//	0,910*	1,465*	1,174*	0,480	1,637*
	//	(0,451)	(0,322)	(0,326)	(0,249)	(0,354)
Pp_{90}	1,123*	0,399*	0,663*	0,690*	1,004*	0,975*
	(0,325)	(0,168)	(0,169)	(0,146)	(0,227)	(0,199)
_Ipanoga_2	-0,245	0,224	0,757*	0,120	0,189	0,288
	(0,328)	(0,218)	(0,288)	(0,201)	(0,207)	(0,186)
_Ipanoga_3	0,006	0,249	-0,029	-0,096	0,131	-0,042
	(0,412)	(0,201)	(0,214)	(0,170)	(0,154)	(0,191)
_Ipanoga_4	-0,967*	//	-0,367	-0,331	-0,797*	-0,134
	(0,233)	//	(0,219)	(0,217)	(0,358)	(0,180)
_Ipanoga_5	-1,362*	0,175	-0,322	-0,192	-0,012	-0,264
	(0,397)	(0,192)	(0,228)	(0,190)	(0,196)	(0,277)
lnlaborl	0,128	0,236*	0,178*	0,150*	0,208*	0,015
	(0,077)	(0,083)	(0,077)	(0,074)	(0,064)	(0,073)
Lnwl	-0,094	0,101	-0,024	0,025	0,064	0,013
	(0,214)	(0,151)	(0,194)	(0,192)	(0,144)	(0,128)
DY92	0,507	0,031	-1,208*	-1,638*	-1,398*	-0,825*
	(0,336)	(0,400)	(0,350)	(0,300)	(0,338)	(0,368)
DY93	-0,008	0,331	-0,337	-1,548*	-1,433*	-0,188
	(0,196)	(0,369)	(0,373)	(0,403)	(0,441)	(0,450)
DY94	-0,006	0,068	-0,257	-0,208	-1,101*	0,165
	(0,179)	(0,380)	(0,407)	(0,261)	(0,270)	(0,241)
DY95	-0,220	-0,371	-0,387	-0,172	-0,824*	0,569
	(0,193)	(0,279)	(0,347)	(0,240)	(0,288)	(0,311)
DY96	0,236	-0,229	0,094	0,405	0,068	0,581*
	(0,285)	(0,413)	(0,266)	(0,231)	(0,246)	(0,292)
DY97	-0,112	-0,159	-0,018	0,256	-0,631*	0,452
	(0,183)	(0,354)	(0,326)	(0,241)	(0,290)	(0,341)
DY98	-0,123	-0,296	-0,329	-0,144	-0,418	0,096
	(0,523)	(0,345)	(0,316)	(0,211)	(0,246)	(0,271)
DY99	-0,060	-0,364	-0,009	0,218	-0,569*	0,924*
	(0,572)	(0,380)	(0,303)	(0,227)	(0,241)	(0,292)
DY100	0,653	0,044	0,007	0,149	-0,104	0,161
	(0,624)	(0,307)	(0,314)	(0,250)	(0,241)	(0,252)
_cons	-1,666	-4,302*	-2,522	-2,861	-3,693*	-3,055*
	(1,806)	(1,257)	(1,557)	(1,610)	(1,251)	(1,132)
$?^2$**		316,3	262,3	333,3	356,5	287

*Statisticaly significant at 5% level
** Wald test: both coefficient Y_{t-1}, $Y_{t-2}Y_{t-1}$ are jointly equal to 0.

Table 6: Results of the Equation (19) - Financial Success of Firms

Regressors	Dependent variable: B09fa (random effect model)
Peu	-0,0016* (0,0009)
DLCvVA	-0,0018 (0,009)
absEU	-0,018 (0,012)
peuabsEU	0,0005** (0,0002)
e11	-0,011* (0,006)
e13	0,0004 (0,0003)
e4m	-0,001*** (0,0004)
e51	0,003 (0,003)
e52	0,002 (0,003)
LS2	-0,00006 (0,0008)
LS3	0,0005 (0,0006)
LS4	0,0004 (0,0007)
NS2	-0,0001 (0,0006)
DD	-0,069 (0,067)
constant	0,094 (0,127)
Ind. dummies	Yes
R2	0,13
X2 (FE vs. RE)	13,16
N	601

*,** in *** statistically significant at 10%, 5% and 1%.

Table 7: Random Effect Ordered Probit Model of Expected Solvency of Firms

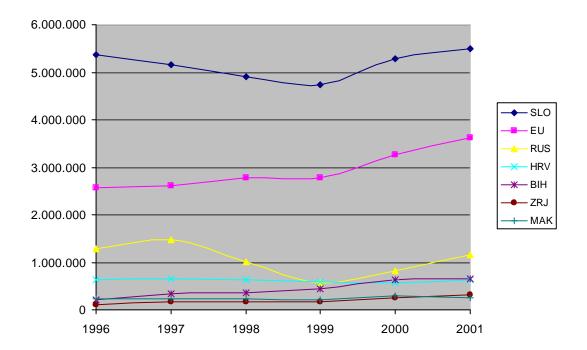| Regressors	Coefficient	Standard Error
B09fa	4,548624***	0,7381357
D32v36	-6,262738***	1,027294
E11	0,267556***	0,0787687
E13	0,0088334*	0,0050679
E4m	0,0092936	0,0064251
E51	0,0615002***	0,0171397
E52	-0,0601654***	0,02484
LS2	-0,0472588***	0,0113291
LS3	-0,0216543**	0,0089836
LS4	0,002378	0,010672
NS2	-0,012078	0,0082557
Dd	3,691746***	0,6742646
Ind. dummies	YES	
Cut1	0,6474868	1,019876
Cut2	2,817082***	1,037551
LR X2	92,37	
N	428	

*,** in *** statistically significant at 10%, 5% and 1%.

Table A1: "Results of Sunk Costs: Marginal Effect of the Export Participation (comparison of Pooled Probit Model and "Wooldridge Model")
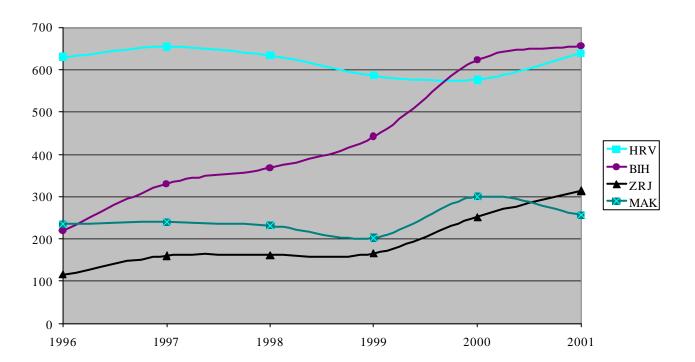
Region	EU		Russia		Croatia		BIH		FRY		Macedonia	
Model	Probit	Woold.	Probit	Woold.	Probit	Woold.	Probit	Woold.	Probit	Woold	Probit	Woold.
Y_{t-1}	0.981*	0.954*	0.918*	0.540*	0.913*	0.890*	0.893*	0.871*	0.759*	0.669*	0.907*	0.858*
	0,011	0,045	0,021		0,019	0,026	0,017	0,021	0,034	0,051	0,017	0,032
$Y_{t-2}/Y_{t-1}=0$	0.039*	0,034	0.346*	0,032	0.247*	0.258*	0.493*	0.439*	0.147*	0,087	0.631*	0.552*
	0,017	0,023	0,177		0,026	0,03	0,078	0,095	0,076	0,068	0,087	0,124
Inlaborl	0.026*	-0,002	0.050*	0,001	0.058*	0,006	0.074*	0,036	0.047*	0,034	0,021	0,011
	0,011	0,032	0,015		0,024	0,07	0,026	0,513	0,011	0,022	0,016	0,03
Lnwl	-0,0008	-0,023	0,021	0,001	-0,025	0,137	-0,042	-0,077	0,014	-0,021	-0,031	0,036
	0,015	0,075	0,029		0,06	0,123	0,076	0,134	0,025	0,041	0,035	0,69

Year dummies and industry dummies included

Marginal effect of dumy variable x = F(x=1) - F(x=0)

Graphs

Graph 1: Revenues by markets

Graph 2: Revenues to former Yugoslav markets

Appendix

In this appendix we show that $\Pi_{it}(Y_{it}=1) - \Pi_{it}(Y_{it}=0)$ is proportional to the variable current gross profit, d_{it}.

We can write $\Pi_{it}(Y_{it}=1) - \Pi_{it}(Y_{it}=0)$ as:

$$\Pi_{it}(Y_{it}=1) - \Pi_{it}(Y_{it}=0) = E\sum_t \frac{d_{it}}{(1+i^t)}$$

where E is an operator of the expected value and i is the discount factor. Since E is a linear operator, we have:

$$\Pi_{it}(Y_{it}=1) - \Pi_{it}(Y_{it}=0) = d_{it} + E\left\{\frac{d_{it+1}}{1+i}\right\} + E\left\{\frac{d_{it+1}}{1+i}\right\} + E\left\{\frac{d_{it+2}}{(1+i)^2}\right\} + \ldots$$

Since the expected value of gross profits in given year does not depend on the discount factor, we have:

$$\Pi_{it}(Y_{it}=1) - \Pi_{it}(Y_{it}=0) = d_{it} + \frac{E(d_{it+1})}{1+i} + \frac{E(d_{it+2})}{(1+i)^2} + \ldots$$

Assuming, that gross profits and factors that affect it follow Markovian process of order one (same assumption was made in Roberts and Tybout, 1997 and in Das et.al., 2001) we have:

$$d_{it} = E(d_{it+1}) = E(d_{it+2}) = \ldots$$

Hence

$$\Pi_{it}(Y_{it}=1) - \Pi_{it}(Y_{it}=0) = d_{it} + \frac{d_{it}}{1+i} + \frac{d_{it}}{(1+i)^2} + \ldots = \frac{d_{it}}{i}$$

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