Methodological Approach to estimation of Macroeconomic Risks in the Implementation of Foreign Trade Operations

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ABSTRACT

The article summarizes the theoretical and practical issues of the optimization process and risk management in the implementation of foreign economic activities at the enterprise. When writing the article, we offered a method for assessing country economic and political risks based on an analysis of sovereign ratings of the countries identified by leading international rating agencies, such as: Standard & Poor's, Moody's and Fitch, as well as the analysis of the news background in relation to a particular country for the rapid identification of possible restrictions in the sphere of bilateral trade. As a result, we developed three main strategies to minimize such risks. After that, we offered a method to minimize possible marketing risks by interviewing key clients of the company and identifying the main risks. To minimize customs risks, we offered a method for the step-by-step determination of the customs value and aggregate customs payment on the basis of current regulatory and legal documents. The next stage was the assessment of possible currency risks, we offered a technique based on historical volatility of the value of currencies, gave a corresponding formula, proposed the main instruments for minimizing currency risks, such as a forward foreign exchange contract, currency option and their derivatives.

Key words: risk management, foreign economic activity, minimization, foreign trade operation, customs value.

Artículo recibido: 05-11-2017
Aprobación definitiva: 10-12-2017

1. INTRODUCTION

The establishment of an effective risk management process at the enterprise carrying out foreign economic activity implies an assessment of previously identified risks incurred by the company when performing foreign trade transactions (Danov A.A., 2008]. Risk classification is a rather complex problem, for the reason that there is no generally accepted risk classification system satisfying all researchers until now. The classification given in Table 1 will be based on a feature such as the scope of risk spread and all risks will be divided into two groups: macroeconomic and microeconomic.

Table 1 - Classification of foreign economic activity risks

No.	Group	Risk types
1	Macroeconomic risks	Country economic risks
		Country political risks
		Marketing risks
		Customs risks
		Currency risks
2	Microeconomic risks	Partner reliability risk
		Risks associated with the terms and conditions of the contract
		Transport and logistics risks
		The risk of receivables

The choice of our methods for assessing the macroeconomic risks is due to the practical applicability of the majority of companies involved in foreign economic activity. Building up their own complex dynamic mathematical and statistical models, which are based on hundreds of constantly changing factors of external and internal business environment, requires huge labor and financial costs and remains the prerogative of large international companies (Guerron-Quintana P., 2012]. Such costs are not possible and will not pay off in the foreseeable future for small and medium-sized businesses. Therefore, our study is aimed at the widest possible coverage of participants in foreign economic activities engaged in foreign trade transactions and represents practical recommendations for optimizing the company's external economic risks.

Artículo recibido: 05-11-2017
Aprobación definitiva: 10-12-2017

2. METHODS

The first risk identified in the previously cited classification is the country's economic risk, which lies in the stability of the state's economy, of which our foreign trade partner is a resident, for the most part. We offer to rank the degree of emerging economic and political risks based on a minimum assessment of two of the top three rating agencies. In general, this method can be presented in the form of a table (Table 2).

Table 2 - Country risk assessment method

A minimum score of two rating agencies	Degree of risk	Expected profitability of foreign trade transactions
AAA, Aaa	Minimal	3-5%
A	Low	5-10%
BB, Ba	Average	10-25%
CCC	High	25-50%
C, Ca	Highest	More than 50%

It should be noted that these profitability intervals for each particular enterprise should be expertly determined based on the specifics of its activities. Country risks are related to the type of risks that cannot be influenced by the enterprise (Hocman F., 2014], therefore it is recommended to use the following strategies for managing them. The first strategy is to avoid risk, if all else being equal; the second strategy is to insure the country risks by means of entering them into a foreign trade contract and describing the tools and ways to minimize them; the third strategy is to take a country risk, if the foreign trade transaction is of high-risk, but has the opportunity to significantly increase the invested capital.

Due to the variability and uncertainty of global and national markets, each enterprise engaged in the implementation of foreign trade transactions is subject to the influence of marketing risks (Burnaby P., Hass S.,2009]. The tools aimed at minimizing such risks on the part of the importer will be selected depending on the factors carrying the marketing risk.

The customs risks faced by the participants in foreign economic activity, and specifically foreign trade transactions, are usually in the adjustment of the FEACN (Foreign

Artículo recibido: 05-11-2017
Aprobación definitiva: 10-12-2017

Economic Activity Commodity Nomenclature) and the customs value (CV) of imported products (Melnikova E.I., Shirshikova L.A.,2011]. Another type of risks that should be assessed and the choice of minimization tools is the currency risks. To assess the currency risks, we will use the historical volatility indicator, which means the standard deviation of the natural logarithm of price change of an asset for a certain period of time (Aswath D.,2003]. In our case, we will analyze the value of any currency expressed in Russian roubles.

The classical formula (1) for calculating the historical volatility is as follows:

$$V = \sqrt{\frac{\sum_{i=1}^{n} u_i^2}{n-1} - \frac{\left(\sum_{i=1}^{n} u_i\right)^2}{n(n-1)}} \quad (1)$$

where $u_i = ln\frac{p_i}{p_{i-1}}$ - the natural logarithm of the ratio of two consecutive prices; n – the number of values used in the calculation.

Thus, we can get the value of daily volatility, but the annual and monthly volatility is of more interest for us. To minimize the currency risks hedge them, we use the instruments of urgent financial market, which consist in the sale and purchase of foreign exchange contracts (Hommel U. 2003].

3. RESULTS

The tools for minimizing the macroeconomic risks considered earlier will be tested using the example of calculating an import transaction carried out by UralDetalServis LLC located in Yekaterinburg and engaged in supplying spare parts for a wide range of imported and domestic special machinery (bulldozers, excavators, loaders, graders, etc.). The deal is to purchase the tracks for excavators Komatsu PC300-7 (FEACN 8431 49 800 9) in the amount of 20 pieces from a supplier from the People's Republic of China (PRC). Further transactions will be entered as frequently as the specific calculations will be needed. The first thing that needs to be paid attention is the analysis of country economic and political risks arising from the transactions with the Chinese suppliers. To do this, we should consider the assessment of the sovereign rating of China by three leading rating agencies (Table 3).

Table 3 - Sovereign rating of the PRC as of April 1, 2017.

Agency	Current credit rating	Forecast
Standard & Poor's	AA-	Negative

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Moody's	Aa3	Negative
Fitch	A+	Stable

In accordance with the rating methodology and the country risk assessment method proposed earlier, the risk level is minimal, accordingly, the profitability at the level of 3-5% will be enough for the transaction conclusion. As for the news background regarding the international relations between the Russian Federation and the PRC as of April 1, 2017, there is no reason to be afraid of imposing any sanctions or restrictive measures.

To assess the marketing risks associated with this transaction, it was initially conducted a primary marketing research of 100 key clients of the company to determine the key factors influencing the choice of consumers when purchasing the caterpillars for special equipment. The survey results are presented in Table 4.

Table 4 - Results of the primary marketing research

Risk factors	Question asked	Results
Uncompetitive price of goods	Does the price play a decisive role in the selection when buying caterpillars for your special equipment?	86%
Low quality of goods	Does the quality play a decisive role in the selection when buying caterpillars for your special equipment?	71%
Low rating of the country of origin of goods in the face of buyers	Do you pay attention to the country-manufacturer of caterpillars in the process of purchase?	67%
Low rating of the manufacturer	Does the name of the manufacturer of caterpillars play some role for you?	45%
Unknown trade mark	Would you refuse to purchase caterpillars from an unknown manufacturer?	22%
Patriotic moods when buying goods, willingness to support domestic manufacturer	Would you be ready to purchase domestic products?	55%
Social tensions and hostility towards goods from the specific countries	Does the public opinion, not concerning the quality of goods produced with respect to one or another manufacturing country, play a role for you when deciding on the purchase of caterpillars?	4%

Artículo recibido: 05-11-2017
Aprobación definitiva: 10-12-2017

Revista Publicando, 4 No 13. (2). 2017, 874-884. ISSN 1390-9304

We should calculate the efficiency of such a foreign trade transaction, since the transaction is planned, and it is not known what course will take place at the time of filing the bill and making payments, then we will fix the following conditions and courses for the convenience of calculations:

– The exchange rate of the Russian rouble is for the period of all payments under the contract: 57 roubles/US dollar.

– The customs duty for this type of goods is set at the rate of 0%, VAT - 18%. These goods does not fall under special protective, anti-dumping and countervailing measures in relation to third countries, as well as under preferential customs rates. The exchange rate at the time of bill submission to the customs authorities of the Russian Federation (EEU) is 60 roubles/US dollar.

The number of caterpillars planned to purchase amounts to 20 pieces, the weight of each caterpillar is 2 tons.

The Company Quanzhou Quanhang Engineering Machinery Co., Ltd. located in China offers caterpillars at the price of 3,900 US dollars pcs. on the basis of the FCA Guangzhou (Incoterms 2010).

Terms of payment and expenses not included in the price:

– Terms of payment - 50% of prepayment after signing the contract, 50% - within five days after shipment. Shipment is carried out within 30 days after receipt of funds to the supplier's account.

– Cargo transportation to the port of departure costs 170 US dollars.

– Forwarding costs at the port of departure amount to 750 US dollars.

– The cost of insurance is 0.05% of the contract value of the cargo.

– Freight of Guangzhou - St. Petersburg - 55 US dollars/ton.

– The costs at the port of arrival and transportation to the company's warehouse in Yekaterinburg amount to 150,000 roubles.

We should make the calculations according to the above terms and conditions (Table 5).

Table 5 - Calculation of the transaction efficiency when supplying goods from China

Indicator	Calculation

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Customs value	((3,900+55*2)*20+170+750+(78,000*0.0005))*60 = 4,869,540 roubles
Customs fee	4,869,540*0.00 = 0 roubles
VAT	4,869,540*0.18 = 876,517.2 roubles
Customs duty	7,500 roubles
Aggregate customs payment	876,517.2+7,500 = 884,017.2 roubles
Gain from deferred payment	(78,000*0.5)*(1.000226)^35-39,000 = 309.68 US dollars
Actual costs	((3,900+(55*2))*20+170+750+(78,000*0.0005)-309.68)*57+ 884,017.2+150,000 = 5,642,428.44 roubles
Effect	6,840,000-5,642,428.44 = 1,197,571.56 roubles
Efficiency	6,840,000/5,642,428.44 = 1.2122

Thus, the efficiency of foreign trade transaction calculated will amount to 21.22% at a selling price for one caterpillar in the amount of 342,000 roubles in the domestic market.

4. DISCUSSION

This indicator can be reduced under the correct calculations of all indicators for two reasons. The first reason is the adjustment of customs value by the customs authorities, even when all the required documents are filed, there is a possibility of increasing the customs value. It is impossible to insure against it, in this case the company will have to defend its interests in the courts and return the excessively paid customs payments. The second reason is the unfavorable changes in the exchange rate, and therefore it is necessary to hedge this kind of risks (Pavlushina A.A.2014]. To begin with, we should calculate the volatility of the value of US dollar for 2016 according to the above formula. As a result of the calculations, we will get a monthly volatility in the amount of 5.79%. At the rate of 57 roubles per US dollar, our currency risk will be 128,712 roubles when paying the second 50% of the contract price in a month. In order to avoid the loss of this amount, it is necessary to use the hedging tools of currency risks.

For clarity, we should assume that the payment condition for the transaction has been changed for a payment deferral for 60 calendar days from the moment of signing the foreign currency forward contract. The column "other expenses" will include all expenses

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for the customs clearance, transportation and cargo insurance. In the first case, we should suppose that the contract was signed on September 30, 2016, this day we concluded a forward contract for the purchase in the amount of 78 ths. US dollars with a value date of November 29, 2016 (Table 6).

Table 6 - Calculation of the forward rate for 60 days with a value date of November 29, 2016

Forward rate USD/RUR (Formula)	Spot-rate + Bonus/Discount
Bonus/Discount (Formula)	Spot-rate (RUR)*((Deposit rate (RUR) - Deposit rate (USD))*Forward time (In days)/360)
Forward time (In days)	60
Spot rate (RUR)	63.16
Deposit rate (RUR), %/100	0.1
Deposit rate (USD), %/100	0.005
Forward rate USD/RUR	64.16
Actual exchange rate on the value date	64.92

As can be seen from the calculations, the received forward rate is lower than the actual exchange rate, which has been developed on the market in 2 months. Naturally, this could not but affect the efficiency of our transaction. We should calculate the efficiency of this transaction when applying the foreign exchange forward contract (Table 7).

Table 7 - Efficiency of a foreign trade transaction using a forward foreign exchange contract for 60 days with a value date of November 29, 2016

Transaction amount (USD)	78,000
Other costs (RUR)	1,071,000
The amount of goods sale on the domestic market (RUR)	6,840,000
Profit including forward rate (RUR)	764,517
Profit including actual exchange rate (RUR)	705,240
Efficiency including the forward rate (Revenue/Costs)	112.58%
Efficiency including the actual exchange rate (Revenue/Costs)	111.50%

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Aprobación definitiva: 10-12-2017

Efficiency of the foreign trade import transaction, as could be seen from the table, increased by 1.09 percentage points as a result of the use of currency forward contract, which corresponded to 59,277 additional roubles received. But it should be noted that not always the application of the forward contract leads to an increase in the efficiency of foreign economic activity.

To illustrate the impact of a currency option on the efficiency of an external economic transaction, we will calculate the same transactions as in the case of a currency forward (Krasovsky N.V., 2012]. It should be noted that the formulas for calculating the option premium are cumbersome enough to do it manually. Therefore, the software based on the Monte Carlo method was used for this purpose (Jeon J.-J., Kim S. and Lee Y., 2017]. We should calculate the transaction on the day of option execution on November 29, 2016 (Table 10).

Table 10 - Efficiency of a foreign trade transaction using a currency option for 60 days with an execution date of November 29, 2016

Call amount, USD	78,000
The value of dollar on the day of option making, RUR	63.16
Strike, RUR	63.16
Days before expiration	60
Premium, RUR	123,162
Actual exchange rate on the expiration date	64.92
Other costs (RUR)	1,071,000
The amount of goods sale on the domestic market (RUR)	6,840,000
Profit including option making (RUR)	719,358
Profit including actual exchange rate (RUR)	705,240
Profit including refusal of option making (RUR)	582,078
Efficiency including the option making (Revenue/Costs)	111.75%
Efficiency including the actual exchange rate (Revenue/Costs)	111.50%
Efficiency including the refusal of option making (Revenue/Costs)	109.30%

The data obtained show that in this case the greatest efficiency will be achieved when executing a currency option, in this case the profit will amount to 719,358 roubles. If the company did not conclude an option transaction, then the efficiency would decrease by 0.25 percentage points and the company would receive less than 14,118 roubles of the

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Aprobación definitiva: 10-12-2017

potential profit. And if the company refused to make the option, the efficiency would be reduced by 2.45 percentage points and the company's profit would decrease by 137,280 roubles from the foreign trade transaction executed. This advantageously distinguishes the option from the forward, where the company should execute the contract. Here the actions are not so limited, the enterprise can always calculate all three options and choose the most profitable. It should also be noted that the efficiency of 108.87% is guaranteed, the company would not have received less amount in any case, no matter what course has been in the market by this date.

5. CONCLUSIONS

In foreign trade transactions, the use of option is more flexible, because it is the right, not the duty, as in the case of forward. Some specialists are frightened off by the fact that it is necessary to pay the premium. But as can be seen from our calculations, the efficiency of a foreign trade transaction may be increased, if the option is refused to be used in comparison with its execution. Moreover, the urgency of using this tool only increases with the current volatility of rouble. The use of these hedging tools of currency risks and their derivatives will allow both improving the efficiency of conducting the foreign economic activity at the enterprise, and making it as predictable as possible.

6. ACKNOWLEDGEMENTS

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

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Artículo recibido: 05-11-2017
Aprobación definitiva: 10-12-2017