

UNIVERSITY OF LJUBLJANA
FACULTY OF ECONOMICS

MASTER THESIS

**MANAGING EXPOSURE TO FOREIGN EXCHANGE RISK IN AN
ELECTRICITY TRADING COMPANY**

Ljubljana, January 2012

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STATEMENT

Student, Ana Veršnik, hereby declare that I am the author of this specialist/master thesis and that I wrote it under the guidance of doc. dr. Katja Zajc Kejžar and that in accordance with 1st (first) paragraph of 21st (twenty-first) Article of the Law on Copyright and Related Rights I allow its publication on faculty web pages.

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INTRODUCTION

The world became heavily intertwined in the past few decades. The main reason behind this is the process of globalization and multinational enterprises' (hereinafter: MNEs) direction towards constant increase of profits and search of new business opportunities.

Therefore, many countries, in the light of gains from international trade, adjust and liberalize its economies to one and common set of rules, to market-based economy. Since countries realized there is a possibility to specialize in areas of comparative advantage and export such goods and on the other side having the possibility to import goods in which they are relatively inefficient (Samuelson & Nordhaus, 1989, p. 938), most of them decided to take the path towards the open economy – an economy that does a lot of trade in goods, services, and assets with other countries (Krugman & Wells, 2006, p. 554).

Beside advantages, international business can also incur unexpected and unfavorable outcomes after business decisions and actions are carried out. These unwanted outcomes are risks in international business and in general refer to volatility of returns in international business transactions caused by events associated with a particular country or to the events associated with actions of a particular economic or financial agent not following the agreed obligations.

Globalization has brought different types of risks, which can in general vary from global or systemic risks to country and firm-specific risks. Management of such risks is important organizational aspect of every company that is engaged in doing business internationally. Risk is connected to probability of possible outcome of adopted decisions and actions and the control over risk is possible when the company possesses the knowledge of possible divergence and riskiness of a business action.

When companies step out of domestic business environment and start trading internationally, they must accept higher risks associated with cross-border trading. Doing business outside domestic market is more risky because actions are more difficult to perform due to barriers such as distance, language, different rules, etc. It is related to specific business risks, which are associated with political systems, legislation system differences, difficulties to assess the partner, problems and risks of international transport, and so on. At the end, it is also more costly.

Trading across borders is connected with exchange of goods, services, and assets and involves coping with different risks, from political and commercial to economic and financial. All mentioned risks are country-specific and this master thesis will devote special attention to one that corresponds to exchange rates, i.e. currency risk.

Currency or foreign exchange (hereinafter: FX) risk arises when MNEs become a subject to fluctuations of exchange rate. Since exchange rates cannot be forecast with perfect accuracy,

MNEs become subject to FX risk and can at least measure their exposures to exchange rate fluctuations in order to undertake proper decisions and actions, directed towards elimination or at least reduction of such risk. We must be aware that any company that conducts trade internationally cannot escape FX risk and even purely domestic companies are in one way exposed to exchange rate fluctuations.

Since the theory is one thing, this master thesis will implicate the theoretical assumptions on real life case of electricity trading company. The company will not be named due to confidentiality reasons, but the data used for practical purpose are real trading quantities and values. The company will be from here on addressed as *the firm* and I will concentrate on the firm's FX activities.

Because of the firm's involvement in international business, the company is highly exposed to exchange rates between the euro as corporate currency and some other currencies, such as Romanian leu (RON), Hungarian forint (HUF), Serbian dinar (RSD) and Croatian kuna (HRK). Therefore, master thesis will primarily try to present and evaluate how the firm monitors different FX exposures and try to suggest some other approaches or hedging techniques in order to lower such exposures.

Thus, the goals of this master thesis will be directed to the point of assessing the firm's current activities for managing its exposure to FX. The firm is a young company with presence on electricity market for few years now, but it is already present on more than 15 markets. Therefore, implementation of risk management process in the firm is of crucial importance for successful elimination of possible loss from exposure to exchange rate fluctuations. A company should have internal policy for risk management and should set up organizational mechanism for awareness, assessment, evaluation and management of risks arising from currency trading.

The hypotheses that I will try to confirm or discard are:

- The international trading activity can cause certain degree of exposure due to FX risk, which is most easily reduced or eliminated by natural hedging.
- The firm despite its youngness and predominant focus on growth and development in its core business detect transaction exposure but does not hedge it perfectly.
- The firm's current organizational environment for management of exposures to FX risk is not yet prepared for assessment and management of economic and translation exposure.

Regarding the assessed activities of the firm, I will try to advise some new or other ways of measuring and managing the exposure with corresponding calculations that will base on the firm's currency positions. In accordance, I will also try to propose changes and completions for protection against FX risk or lowering current and future exposure to such risk.

First parts of master thesis will base on descriptive method, which is the most appropriate for presentation of theoretical background in the field of exchange rate and FX. Theory is fundamentally necessary for any further research regarding FX trading and currency hedging. The latter parts will be more practically directed, where the master thesis will, based on gathered knowledge during the courses of master program of the International business, transfer the knowledge to the case of the firm. Therefore, the master thesis will compound of theoretical background and empirical case study.

The master thesis is compound of four parts. First part will present basics of exchange rate determination and possible exchange rate systems with their main features, since each country can decide how its exchange rate will be determined and to what extent will be controlled. At the end of the first part, the thesis will be extended to foreign exchange (FX) and corresponding FX market. Within the FX market, certain transactions are carried out, where some of them are done purely for the purpose of conducting a cross-border business (spot and forward transactions), while others are techniques for hedging against FX risks (forward, currency swaps, futures and options) or for speculation purposes. The second part will present FX risk, management of such risk and associated tools or hedging techniques against such risk.

The third part of master thesis will be devoted to empirical analysis. The reason behind practical analysis is to transfer the theoretical knowledge on real life case and show how theory works in practice. I will concentrate especially on activities of one of the firm's business units and its FX activities.

The fifth part is the conclusion of master thesis and will point out main findings. I will try to suggest some further recommendations for successful management of FX exposure. There will most probably be some common suggestions and some custom advices for analyzed company. At the end, I will try to confirm or refute the studied hypothesis.

1 EXCHANGE RATE DETERMINATION AND FX MARKET

1.1 Determination of exchange rates

The exchange rates are the values of different national currencies in terms of each other. In international trade, the exchange between companies and nations is based on the element of the foreign exchange rate, which denotes the price of a foreign country's currency in terms of our own (Krugman & Wells, 2006, p. 555).

In order to be equipped with basic determinants of exchange rate, this part will serve as a short introductory entry for more extended field of FX management.

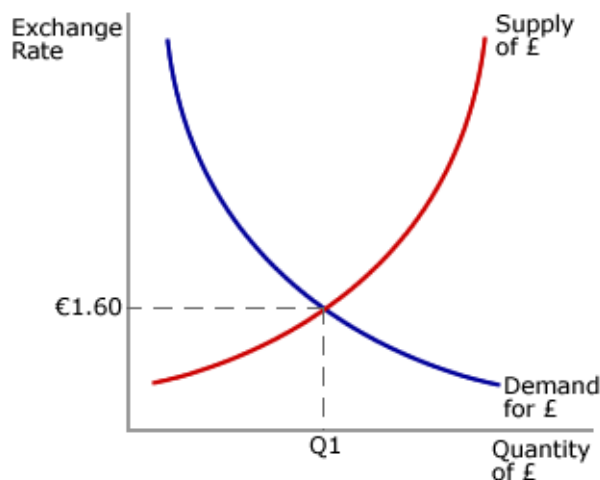
The basic element of trading with different currencies is the exchange rate, which is the number of units of one currency that must be given to acquire one unit of another currency.

The exchange rate, then, is the link between different national currencies that makes international price and cost comparisons possible (Harrison, 1993, p. 322). Since many times the exchange rate of one currency for another can trigger some confusion regarding quoting, traders, on FX market, differentiate between direct and indirect quote and between spot and forward rate. The direct quote or normal quote is the number of units of domestic currency needed to acquire one unit of the foreign currency. A rate quoted in terms of the number of units of the foreign currency for one unit of domestic currency is called the reciprocal quote, or indirect quote (Harrison, 1993, p. 322). The spot rate is the rate quoted for current foreign-currency transactions. It applies to interbank transactions that require delivery of the purchased currency within two business days in exchange for immediate cash payment for that currency. The forward rate is a contractual rate between a foreign-exchange trader and the trader's client for delivery of foreign currency sometime in the future, after at least two business days but usually after at least one month (Harrison, 1993, p. 326).

Above described basics are important from the aspects of any MNE that is doing business internationally. These international transactions of buying and selling currencies, then, require a market – the foreign exchange market – in which currencies can be exchanged for each other. This market actually determines exchange rates, the prices at which currencies trade (Krugman & Wells, 2006, 845). The foreign exchange market works in same way as usual market-base mechanism and it matches up the demand for a currency from foreigners who want to buy domestic goods, services, and assets with the supply of a currency from domestic residents who want to buy foreign goods, services, and assets. The FX demand and FX supply act in similar way as normal demand and supply forces, pushing towards the equilibrium exchange rate. The equilibrium exchange rate is the exchange rate at which the quantity of currency demanded in the FX market is equal to the quantity supplied (Krugman & Wells, 2006, p. 847).

In Figure 1, the vertical axis is the crucial foreign exchange rate, measured in units of domestic currency per unit of foreign currency (for example, in euro per pound). The horizontal axis shows the quantity of pounds (foreign currency from the Slovenia's perspective) transacted in FX market. The supply of UK pounds is represented by the upward-sloping red-colored curve. The main point here is that as the foreign exchange rate rises, the number of euro that can be bought per pound increases. This means, other things being equal, that the prices of goods in the Euro Area fall relative to those from the United Kingdom. Hence, residents of United Kingdom will tend to buy more euro-denominated goods, and the supply of UK pounds therefore increases. The blue-colored demand curve in Figure 1 slopes downward to indicate that as the pound's value falls (and the euro therefore becomes more expensive), residents of the Euro Area will want to buy more foreign goods, services, and investments. They will therefore demand more UK pounds in the FX market (Samuelson & Nordhaus, 1998, p. 679).

Figure 1: Exchange rate determination



Source: Theory 1 – Determination of exchange rate, 2011.

The basis behind the slopes of these curves is that the level of the exchange rate affects exports and imports. When a country's currency appreciates (becomes more valuable), exports fall and imports rise. When a country's currency depreciates (become less valuable), exports rise and imports fall (Krugman & Wells, 2006, p. 846). Nevertheless, the exchange rate works as a price and it affects output, inflation, foreign trade, and many other central economic goals of each country. Therefore, the exchange rate can be derived in the course of FX market-based mechanism through demand and supply forces, but many times governments choose to try to affect exchange markets.

Since change in exchange rate affects trading activity of countries, we should also consider differentiation between appreciation/depreciation and revaluation/devaluation of one currency towards another. Thus, when a country's foreign exchange rate has declined relative to that of another country, it means that the domestic currency has depreciated while the foreign currency has appreciated. On the other hand, when a country's official foreign exchange rate (relative to gold or other currencies) is lowered, it means that the currency has undergone devaluation, while an increase in the official foreign exchange rate is called revaluation (Samuelson & Nordhaus, 1998, p. 680).

From the above paragraph, we can conclude that appreciation/depreciation is connected with market forces, determined on FX market, while devaluation/revaluation is connected with country's actions to artificially lower or raise the price of its domestic currency. Hence, we also distinguish between different exchange rate systems, which will be further explained in the following paragraphs.

1.2 Changes of exchange rates

At the most basic level, exchange rates are determined by the demand and supply of one

currency relative to the demand and supply of another. However, this does not explain what factors underlie the demand and supply of a currency. At this point, the master thesis will present reasons behind differences in relative demand and supply of currency, which causes the currency's exchange rate to appreciate or depreciate. International parity conditions are fundamental economic relationships that help explain exchange rate movements. There are five underlying theories that present five key relationships among spot exchange rates, forward rates, inflation rates, and interest rates: purchasing power parity, Fisher effect, international Fisher effect, interest rate parity and forward rates as unbiased predictor of future spot rates (The international parity conditions and the global fisher effect, 2011).

1.2.1 Purchasing power parity

The purchasing power parity (PPP) theory is dealing with relationship between the expected change of spot exchange rate and the expected level of inflation rates of two countries (Mrak, 2002, p. 195-198). PPP theory predicts that changes in relative prices will result in a change in exchange rates (Hill, 2007).

To take account of the effects of differences in inflation rates, economists calculate real exchange rates, exchange rates adjusted for international differences in aggregate price levels. For example, we are having the number of the euro per UK pound. Let P_{UK} and P_{EUR} be indexes of the aggregate price levels in the United Kingdom and the Euro Area, respectively. Then the real exchange rate between pound and euro is defined as

$$\text{Real exchange rate} = \text{UK pounds per euro} \times P_{UK}/P_{EUR}. \quad (1)$$

To distinguish it from the real exchange rate, the exchange rate unadjusted for aggregate price levels is sometimes called the nominal exchange rate (Krugman & Wells, 2006, p. 849). In the long run there is no doubt that relative rates of inflation are the most important determinant of a country's rate of exchange. If one country has a higher rate of inflation than its trading partners then, at any given rate of exchange, its exports will become less competitive. In consequence, demand for its currency will fall on the FX market as export demand falls, and supply of its currency will increase as import demand rises. This will cause the rate of exchange to depreciate against all other currencies (Harrison, 1993, p. 195).

While PPP theory seems to yield relatively accurate predictions in the long run, it does not appear to be a strong predictor of short-run movements in exchange rates covering time spans of five years or less (Hill, 2007).

As already explained, PPP is connected with real exchange rate, but this is not an actual price of currency; it is rather an index number of the relative prices of home and foreign goods. The real exchange rate is also the inverse of competitiveness. A country whose goods were becoming relatively cheap in world markets would be said to be improving its competitiveness but to having a falling real exchange rate, and vice versa. Therefore, the PPP

adjusts exchange rate so that the relative prices of the two nations' goods (measured in the same currency) are unchanged, because the change in the relative values of the two currencies compensates exactly for differences in national inflation rates (Lipsey & Chrystal, 2007, pp. 510–511).

The basic conclusion behind the theory is that every expected change between the inflation rates of two countries will be compensated with proper and expected change of spot exchange rate of their currencies. For currency, which exchange rate is changing in accordance with this theory, holds that its real exchange rate remains unchanged (Mrak, 2002, pp. 195–198).

The PPP is very useful in explaining the relationship between inflation and exchange rates, but is not perfect. Several researches (Hill, 2007) state that the theory seems to predict best the exchange rate changes for countries with high rates of inflation and underdeveloped capital markets. The theory is less useful for predicting short-term exchange rate movements between the currencies of advanced industrialized nations that have relatively small differentials in inflation rates. In addition, exchange rates are essentially a function of internationally traded goods, whereas inflation rates relate to all goods, traded or not. Another good illustration of fallibility of the PPP theory for estimating exchange rates is the Big Mac index of currencies by The Economist each year. The price of a Big Mac can be used to estimate exchange rate between the dollar and another currency (Daniels & Radebaugh, 1995, pp. 364-365). Yet another factor of some importance is that governments also intervene in the foreign exchange market in attempting to influence the value of their currencies, and this further weakens the link between price changes and changes in exchange rates (Hill, 2007).

1.2.2 Interest rate parity

Interest rate parity is dealing with relationship between spot and forward exchange rate on one side and interest rates' change of two countries on the other (the interest rates are fixed in the time of transaction) (Mrak, 2002, p. 195–198). In the modern world, funds are highly mobile between currencies and therefore, if all other things remain equal, an increase in the rate of interest in one country relative to interest rates in other countries will cause the exchange rate to appreciate. Hence, a rise in interest rates in one country relative to other countries implies a higher return on funds invested in that country. In consequence, if one country increases its rate of interest and all other things remain equal, demand for that country's currency will increase as foreigners take advantage of the higher return. There might also be a reduction in supply of currency as domestic residents now invest at home rather than abroad. The combined effect will be to force exchange rate upwards (Harrison, 1993, p. 195). Change in interest rate is therefore a major motive for short-term capital flows. If one major country's short-term rate of interest rises above the rates in most other countries, there will tend to be an inflow of short-term capital into that country in the effort to take the advantage of the high rate, which will tend to appreciate the currency. If these short-term interest rates should fall, there will most likely be a sudden shift away from that country as a location for short-term funds, and its currency will tend to depreciate (Lipsey & Chrystal, 2007, p. 509).

The conclusion is that the positive (negative) change in interest rates of two countries is exactly matching forward premium (discount) on foreign currency (Mrak, 2002, p. 195–198).

1.2.3 Fisher effect

The economic theory explains that interest rates reflect expectations about likely future inflation rates. In countries where inflation is expected to be high, interest rates will also be high, because investors want compensation for the decline in the value of their money. This relationship was first formalized by economist Irvin Fisher and is referred to as the Fisher effect (Hill, 2007). The Fisher parity states that nominal interest rates (r) in each country equal the required real rate of return (R) plus a premium for expected inflation (I) over the period of time for which the funds are to be lent (i.e. $r = R + I$). The theory implies that countries with higher rates of inflation have higher interest rates than countries with lower rates of inflation (The international parity conditions and the global fisher effect, 2011).

1.2.4 International Fisher effect

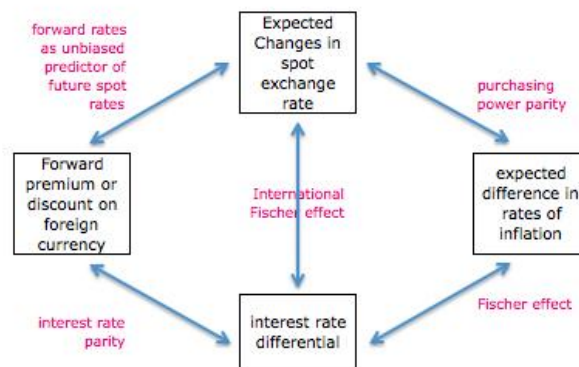
Since we know from PPP theory that there is a link between inflation and exchange rates, and since interest rates reflect expectations about inflation, it follows that there must also be a link between interest rates and exchange rates. This link is known as the International Fisher Effect (IFE). The International Fisher Effect states that the spot exchange rate should change by the same amount as the interest differential between two countries. This parity condition effect is derived by combining the purchasing power parity and the Fisher effect. The rationale behind this theory is that investors must be rewarded or penalized to offset the change in exchange rates. Thus, the currency with the lower interest rate is expected to appreciate relative to the currency with the higher interest rate (The international parity conditions and the global fisher effect, 2011; Hill, 2007).

1.2.5 Forward rates as unbiased predictor of future spot rates

Another important economic aspect in explaining exchange rate changes is a forward-spot relationship. Under conditions of risk neutrality and rational expectations in the foreign exchange market, there should be a one-to-one relationship between the forward rate and the corresponding future spot rate (Delcoure, Barkoulas, Baum & Chakraborty, 2000). The unbiased hypothesis is related to the notion of FX market efficiency, as summarized by the uncovered interest rate parity (UIP) condition, which states that the expected exchange rate change should equal the current interest rate differential, or in the absence of arbitrage, the forward premium (the difference between the forward and spot rates). Under UIP and in the absence of arbitrage (i.e. assuming that covered interest parity holds), the forward exchange rate provides an unbiased forecast of the future spot exchange rate, or, equivalently, the forward premium provides an unbiased forecast of the future change in the spot exchange rate (Nikolau & Sarno, 2005, p. 2).

Despite of the fact that theoretical foundations of this hypothesis seem sound, it is one of the most researched and yet controversial hypotheses in the international finance literature. The vast amount of empirical work has very rarely supported this hypothesis. Aggarwal, Lin & Mohanty (2008) in their improved econometric analysis tested the most liquid markets and all major currencies (American dollar against British pound, Japanese yen, Swiss franc) and proved that in the spite of large trading volumes and low trading costs there continue to be seemingly large and persistent deviations from efficiency and rationality. Moon and Velasco (2009) on the other hand carried out an extended research, based on data set of US bilateral exchange rates in period 1975–2007, and found out that negative correlation between the forward premium and the exchange rate change in that a low interest rate currency tends to be depreciated rather than appreciated. However, the tests in past years provided consistent empirical evidence that forward rates are simply not efficient or rational forecasts of future spot rates.

Figure 2: International parity conditions



Source: The international parity conditions and the global fisher effect, 2011.

Figure 2 in simplified way presents five international parity conditions, already explained in previous paragraphs. It displays that under a freely floating exchange rate system, future spot exchange rates are theoretically determined by differing national rates of inflation, interest rates, and the forward premium or discount on each currency. Interest rates and inflation rates, along with spot rates and forward rates, cannot change independently of one another (The international parity conditions and the global fisher effect, 2011).

1.2.6 Other factors

Beside inflation and interest rates the international economy recognizes some other factors behind exchange rate changes as well, which are (we are assuming all other conditions remain equal in each case):

- The current account. Changes in the state of the current account will also cause a change in the exchange rate. When the current account deficit worsens, the gap between import expenditure and export earnings widens. For the deficit country, this implies an increase in supply of its currency and a reduction in demand for its currency, with the inevitable result that its currency depreciates.

- Expectations. Expectations or speculations on country's exchange rate are also a motive for short- and long-term capital movements. When a currency is expected to appreciate, foreigners will rush to buy assets denominated in that currency; if currency is expected to depreciate, they will be reluctant to buy or hold financial assets. Moreover, if expectations or speculations are correct, holders of that currency make a capital gain. Many factors can influence expectations and investors will act upon any new information that becomes available which influences their expectation of future exchange rates. In this sense, expectations about the factors discussed above will influence the exchange rate as investors seek to make a capital gain (Harrison, 1993, p. 195; Lipsey & Chrystal, 2007, p. 509).

- Structural changes. An economy can undergo structural changes that alter the equilibrium exchange rate. "Structural change" is an all-purpose term for a change in technology, the invention of new products, or anything else that affects the pattern of comparative advantage. For example, when a country's products do not improve in quality as rapidly as those of some other countries do, the consumers of that country demand (at fixed prices) will shift slowly away from its own products and towards those of its foreign competitors. This will cause a slow depreciation in the first country's currency (Lipsey & Chrystal, 2007, p. 510).

1.3 Exchange rate systems

Having reviewed the principles underlying the market determination of exchange rates, we can now turn to the analysis of the exchange-rate system, which denotes the set of rules, arrangements, and institutions under which payments are made and received for transactions reaching across national boundaries. At the outset, we must clarify that the reason behind the system for regulation of exchange rates is governments determination that the exchange rate is too important to be left to the unregulated market. FX rates does affect output, inflation, foreign trade, and many other central economic goals, so it is natural that governments will try to affect exchange markets in ways they think is favorable for their political and economic health (Samuelson & Nordhaus, 1989, p. 941).

The most general distinction of exchange rate systems used today are flexible and fixed exchange rates. One system occurs when exchange rates are completely flexible and move purely under the influence of supply and demand. With this system, known as flexible exchange rates (or sometimes "floating" exchange rates), governments take hands-off policy toward their exchange rate and do not try to set particular rate. That is, flexible-exchange-rate system, the relative prices of currencies are determined in the marketplace through the buying and selling of households and businesses. The other major system is fixed exchange rates, where governments specify the rate at which their currency will be converted into other currencies or they keep the exchange rate against some other currency at or near a particular target. The gold standard was a fixed-exchange-rate system, as was the Bretton Woods system used by most countries after World War II (Samuelson & Nordhaus, 1989, p. 679–680). Between these two pure regimes are many possible intermediate cases.

Perhaps the most known classification of exchange rate regimes is one of the International Monetary Fund (IMF). The IMF (2009) presented revised classification system, dividing regimes in floating arrangements on one side and in hard/soft pegs on the other. Floating arrangements are further divided into floating and free floating. A floating exchange rate is largely market determined, without an ascertainable or predictable path for the rate and may exhibit more or less exchange rate volatility, depending on the size of the shocks affecting the economy. In the case of the free-floating arrangement, the interventions occur only exceptionally and the country's authorities have transparent approach on reporting about market developments. Soft pegs classification consists of conventional pegged arrangement, stabilized arrangement, crawling peg, crawl-like arrangement and pegged exchange rate within horizontal bands. On other hand, hard pegs compose of exchange arrangement with no separate legal tender and currency board arrangement. The common characteristics for hard and soft pegs are binding the exchange rate to another currency or basket of currencies and monetary authorities' interventions (IMF, 2009, p. 11–15).

Anyway, governments have some options for holding exchange rate fixed or around particular target zone. Those are: (1) exchange market interventions, (2) monetary policy changes and (2) FX controls. (1) Government purchases or sales of currency in the FX market are exchange market interventions and are connected with foreign exchange reserves. These reserves are stocks of foreign currency that governments maintain to buy their own currency on the FX market in order to support its price and bring the exchange rate within agreed frames of target zone. (2) The next way that governments fix exchange rates is by changing monetary policy. The central bank can change a country's interest rate and thus affect the capital flows. (3) FX controls are third way of fixing the value of country's currency and are licensing systems that limit the right of individuals to buy foreign currency. It can be done by requiring domestic residents who want to buy foreign currency to get a license and giving these licenses only to people engaging in approved transactions (Krugman & Wells, 2006, p. 855–856).

From the MNE's perspective, it is important to understand the exchange-rate arrangements for the currencies of countries in which they are doing business so that they can more accurately forecast trends. It is much easier to forecast a future exchange rate for a relatively stable currency that is pegged for example to the euro than for a currency that is freely floating and relatively unstable.

1.4 FX transactions

Next few paragraphs are devoted to the presentation of possible transactions, which can be carried out on FX market by actions of market participants. As we already explained at the beginning of this chapter some of FX transactions are done purely for the purpose of conducting cross-border business (spot and forward transactions), while others are techniques for hedging against FX risks (forwards, currency swaps, futures and options) or with

speculation background.

FX trading takes place especially in many financial centers, with the largest volume of trade occurring in such major cities as London (the largest market), New York, Tokyo, Frankfurt, and Singapore. The worldwide volume of FX trading is enormous, and it has ballooned in recent years. In April 1989 the average total value of global FX trading was close to \$600 billion per day, while in April 2004, the daily global value of FX trading had jumped to around \$1,9 trillion (Krugman & Obstfeld, 2008, p. 311). According to the Bank for International Settlements, as of April 2010, average daily turnover in global foreign exchange markets is estimated at \$4.0 trillion, a growth of approximately 20 % over the \$3.3 trillion daily volume as of April 2007 (Turnover on the global foreign exchange market, 2011).

1.4.1 Cross-border business

Most FX transactions are conducted by commercial banks. Significant trades take place between FX brokers, specialists who facilitate interbank transactions (Daniels & Radebaugh, 1995, p. 327). The most common type of FX transaction involves payment and receipt of the foreign exchange within two business days after the day the transaction is agreed upon. The two days period gives adequate time for the parties to send instructions to debit or credit the appropriate bank accounts at home and abroad. This type of transactions is called spot transaction, and the exchange rate at which the transaction takes place is called the spot rate. Besides spot transactions, there are also forward transactions.

A forward transaction involves an agreement today to buy or sell a specified amount of foreign currency at a specified future date at a rate agreed upon today (the forward rate). The typical forward contract is for one month, three months, or six months. Forward contracts for longer periods are not as common because of great uncertainties involved. However, forward contracts can be renegotiated for one or more periods when they become due. The equilibrium forward rate is determined at the intersection of the market demand and supply curves of FX for future delivery (Salvatore, 2007, p. 491–492). It is distinguished from the spot rate, however, there exists an equilibrium that results from the relationship between forward and spot exchange rates within the context of covered interest rate parity. The latter is responsible for eliminating or correcting market inefficiencies that would create potential for arbitrage profits. The forward exchange rate must generally differ from the spot exchange rate, such that a non-arbitrage condition is sustained. Therefore, the forward rate is said to contain a premium or discount, reflecting the interest rate differential between two countries. The forward exchange rate differs by a premium or discount of the spot exchange rate: $F = S \cdot (1 + P)$ where P is the premium (if P is positive) or discount (if P is negative). In practice, forward premiums and discounts are quoted as annualized percentage deviations from the spot exchange rate, in which case it is necessary to account for the number of days to delivery as follows:

$$P_N = (F/S - 1) \cdot 360/d, \quad (2)$$

where N represents the maturity of a given forward exchange rate quote and d represents the

number of days to delivery (Madura, 2006).

1.4.2 Hedging

Techniques for hedging against FX risk or FX transaction with speculative background consist of currency swaps, outright forwards, futures and options.

A currency or FX swap refers to a spot sale of a currency combined with a forward repurchase of the same currency – as a part of a single transaction (Salvatore, 2007, p. 493). For example, a three-month swap of dollars into euros may result in lower broker's fees than the two separate transactions of selling dollars for spot euros and selling the euros for dollars on the forward market. Swaps make a significant proportion of all FX trading (Krugman & Obstfeld, 2008, p. 316).

The other major FX transactions are outright forwards, options and futures contracts and are commonly known as derivatives. All these are term instruments, meaning that the performance of the contract is transferred in its entirety to a (determined) date or period in the future, even though all the essential elements are determined at the conclusion of the contract (Berk, Peterlin & Čok, 2009, p. 287–288).

The outright forward is a forward contract that is not connected to a spot transaction. The advantage of the outright forward is that it sets the amount of one currency that will be paid or received and establishes the cost up-front. The size of the contract is relatively flexible, and there is no brokerage cost attached to the contract since a broker is not used (Salvatore, 2007, p. 495; Daniels & Radebaugh, 1995, p. 328–329).

An option is the right but not the obligation to buy (a call option) or to sell (a put option) a standard amount of a traded currency on a stated date (the European option) or at any time before a stated date (the American option) and at a stated price (the strike or exercise price). The option provides the company more flexibility than a forward does and future contract would; however, the company must pay the brokerage fee and the premium regardless of whether it exercises the option or not (Salvatore, 2007, p. 495; Daniels & Radebaugh, 1995, p. 328–329).

The futures contract resembles the forward contract in that it specifies an exchange rate sometime in advance of the actual exchange of currency. However, it is less flexible than a forward contract because it is for a specific currency amount and a specific delivery dates; a forward contract, in contrast, can be tailor-made to fit the size of the transaction and the delivery date. Forward contracts depend on a client's relationship with a bank's FX trader, but a futures contract can be entered in by anyone through a securities broker. The futures market differs from a forward market in that in the futures market only few currencies are traded and trades are subject to a daily limits on exchange rate fluctuations. Futures contracts are usually for smaller amounts than forward contracts and thus are more useful to small companies than

to large ones but are somewhat more expensive. Futures contracts can also be sold at any time up until maturity on an organized futures market, while forward contracts cannot. While the market for currency futures is small compared with the forward market, it has grown very rapidly, especially in recent years. Trading in FX futures was initiated in 1972 by the International Monetary Market (IMM) of the Chicago Mercantile Exchange (CME). The futures and forward markets are also connected by arbitrage when prices differ (Salvatore, 2007, p. 495; Daniels & Radebaugh, 1995, p. 328–329).

Forwards, futures and swaps are known as a cheaper means of risk management and have a symmetrical return profile. Options are more expensive but allow for the limitation of loss, which is a big advantage in cases of the uncertain realisation of planned business activities. Any international company should therefore opt for a forward, future or swap when it wishes to hedge an already existing or concluded contract, while for the hedging of contracts that are only planned it is wiser to choose an option. Namely, the meaning of this symmetry is that a derivative offsets the initial exposure of a hedged item. Forwards, futures and swaps hence enable precise forecasting of the business outcome; options on the other hand can render it possible to make some profit even if the contract is not concluded, provided that movement of the value of the underlying asset is favourable. The research on a sample of US companies proved that the use of options is increasing with the variability of the cash flows (Berk, Peterlin & Čok, 2009, p. 287–288).

Mentioned transactions are held in awareness of traders and MNEs that participate on such markets are exposed to some degree of risk. As above already shortly mentioned and described, the associated FX risk will be further presented and analyzed in the following part of the master thesis.

2 MANAGEMENT OF FX RISK

When companies step out of domestic business environment and start trading internationally, they must accept higher risks associated with cross-border trading. One among those risks is FX risk and MNEs become subject to fluctuations of exchange rate. As already mentioned, exchange rates cannot be forecasted with perfect accuracy; however, the MNEs can at least measure their exposures to exchange rate fluctuations. There are three types of exposures that are connected with FX risk: transaction, translation and economic exposure. This part of master thesis will therefore comprise of presentation of FX risk, definition of all types of exposures and assessment of hedging techniques against such risk.

Companies today know the risk of international operations. They are aware of the substantial risks to balance sheet values and annual earnings that interest rates and exchange rates may inflict on any company in any time. Financial managers, international treasurers, and financial officers of all kinds are expected to protect the company from such risks. The company's managers must therefore be familiar with the laws and regulations that govern the financial

exchanges worldwide. The international financial manager is involved with the acquisition and allocation of financial resources for the company's current and future activities and projects, with the primary objective of maximizing the company's value. These managers need to be competent in carrying many financial management tasks critical to companies engaged in international business, including Currency risk management – management of the multiple-currency transactions of the company and the exposure to risk created by exchange rate fluctuations (Cavusgil, Knight & Riesenber, 2008, p. 581; Czinkota, Ronkainen & Moffett, 2011, p. 586).

Thus, one among the best-known and ever-present types of business specific risks is FX or currency risk – the risk of adverse unexpected fluctuations in exchange rates. It is commonly known that the exchange rate has major consequences on a country's level and composition of output and consumption, as well as on its overall economic well-being. The risk also involves large consequences for non-residents investing in the country or doing business with it (Clark & Marois, 1996, p. 50). On the other hand, currency risks affect the company on a direct level through the company's business and transactions by having an impact on the company's payables and receivables, which in turn directly affect the overall financial result. Simply put, currency rate fluctuations may affect the settlement of contracts, cash flows and the firm valuation; therefore it is of value to the firm and the shareholders that the currency risk is properly managed in order for the firm to be able to stabilize its cash flows and enhance the firm value (Eun & Resnick, 2007, p. 192).

Therefore, currency fluctuations result in three types of exposure for the company, already mentioned above: transaction exposure, translation exposure and economic exposure, which will be presented next.

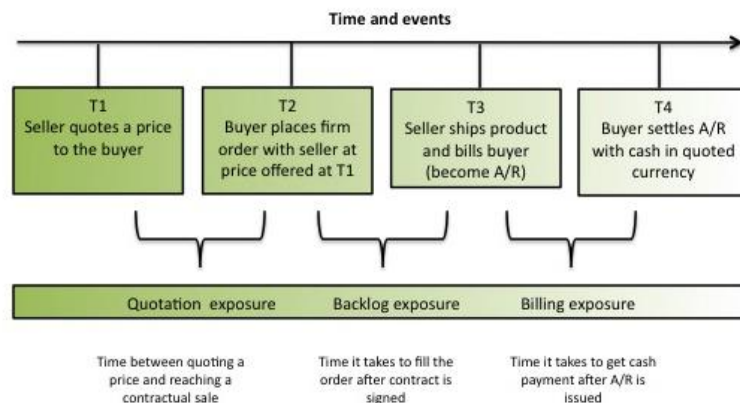
2.1 Transaction exposure

Transaction exposure is the most commonly observed type of exchange rate risk. Only two conditions are necessary for a transaction exposure to exist: a cash flow that is denominated in a foreign currency and the cash flow that will occur at a near future date (Robock & Simmonds, 1989, p. 556).

Transaction exposure can be thus defined as the sensitivity of realized domestic currency values of the company's contractual cash flows denominated in foreign currencies to unexpected exchange rate changes (Eun & Resnick, 2007, p. 192). It is a price risk, which is a major problem for international commerce and it is an uncertain value to the company of its open position in cross-currency commitments (Czinkota, Ronkainen & Moffett, 2011, p. 587).

Figure 3 presents an ordinary example of transaction exposure, which arises when a company has a payable or receivable denominated in a foreign currency. The total transaction exposure consists of quotation exposure, backlog exposure and billing exposure (Eitman & Stonehill & Moffet, 2007, p. 258).

Figure 3: The development stages of transaction exposure



Source: D. Eitman, A. Stonehill & M. Moffet, *Multinational business finance*, 2007.

The transaction exposure is actually created at the moment the seller quotes a price in foreign currency terms to a potential buyer (T1). With placing of an order, the exposure created at the beginning of the quotation is converted into backlog exposure (T2). Backlog exposure lasts until the goods are billed, which forms an account receivable, A/R (T3), at which time it becomes billing exposure, which remains until the seller receives payment (T4) (Eitman & Stonehill & Moffet, 2007, p. 258).

2.2 Economic exposure

Economic or operating exposure measures the extent to which a company's future international business earning power is affected by changes in currency values. It is concerned with the impact of currency changes on future sales, pricing of products, the cost of inputs and the value of foreign investments. When a company prices its products, the exchange rate fluctuations help or hurt sales, by making those products relatively more or less expensive from the standpoint of foreign buyers. Similarly, when sourcing inputs, the company may be harmed by currency shifts that raise the price of those inputs. The value of foreign investments can also fall, in home currency terms, with exchange rate changes. In technical terms, it reflects the extent to which the net present value of expected after-tax flows will be affected as exchange rates change. From the standpoint of the long-run health of an enterprise, the economic exposure is far more important than either transactions or translation exposure (Robock & Simmonds, 1989, p. 556; Cavusgil, Knight & Riesenberger, 2008, p. 593–594), since it can be seen not only as the sensitivity of a company's future cash flows to unexpected changes in foreign exchange rates, but also as the sensitivity to other macroeconomic variables, such as interest and inflation rates (Eitman, Stonehill & Moffet, 2007, p. 302).

Economic exposure is different from transaction exposure. Transaction exposure involves the effect of exchange rate fluctuations on ongoing contractual transactions. Economic exposure involves the effect of exchange rate fluctuations on long-term profitability resulting from changes in revenues and expenses. Thus, all types of anticipated future transactions that cause transaction exposure also cause economic exposure because these transactions represent cash

flows that can be influenced by exchange rate fluctuations. In addition, other types of businesses that do not cause transaction exposure can cause economic exposure. These effects appear in the company's financial statements and all companies, directly or indirectly, have economic exposure (Madura, 2006, p. 310; Cavusgil, Knight & Riesenberger, 2008, p. 594).

International business transactions that require conversion of currencies, and thus reflect transaction as well as economic exposure, include (Madura, 2006, p. 310–311):

- exports denominated in foreign currency,
- interest received from foreign investments,
- imports denominated in foreign currency, and
- interest owed on foreign loans.

The other transactions, which do not require conversion of currencies and therefore do not reflect transaction exposure, but are a form of economic exposure, since exchange rate movements can influence the cash flows resulting from these transactions, are (Madura, 2006, p. 310–311):

- local sales (relative to foreign competition in local markets),
- company's exports denominated in local currency and
- company's imported supplies denominated in local currency.

Exposure to currency risk is calculated by the sensitivities of the future home currency value of the company's assets and liabilities as well as the company's operating cash flows to random changes in exchange rates. Thus, the exposure is measured by forecasting and analyzing all of the company's future individual transaction exposures together with the future exposures of all the company's competitors worldwide (Eun & Resnick, 2007, p. 225). It is argued that while there is an understanding of the effects of random exchange rates changes on the home currency value of the company's assets and liabilities denominated in foreign currencies, the effects of volatile exchange rates on operating cash flows are not fully understood. As the economy becomes increasingly globalized, more companies are subject to international competition. Fluctuating exchange rates may gravely alter the relative competitive positions of such firms in domestic and foreign markets by effects on the operating cash flows (Eun & Resnick, 2007, p. 228).

2.3 Translation exposure

Translation exposure, also called the accounting exposure, measures the impact of currency changes on the reported consolidated results and balance sheet of a company. Translation exposure is essentially concerned with present measures of past events, and the accounting gains and losses in translation are said to be unrealized. To report consolidated worldwide operations, the financial statements must be translated from the local currencies in which they are recorded to the measurement currency used by the headquarters. This translation follows rules set by the government of the parent company, an accounting association, or the company itself. The amount of translation exposure will depend upon which of the alternative

translation methods are used (Robock & Simmonds, 2006, p. 556). MNEs with multi-country operations consolidate financial results in order to generate organization-wide reports. Accounting practices also require the company to report consolidated financial results in the functional currency (Cavusgil, Knight & Riesenberger, 2008, p. 592).

Translation exposure occurs because, as exchange rates fluctuate, so do the functional-currency values of exposed assets, liabilities, expenses, and revenues. Assets and liabilities that are translated at the current (postchange) exchange rate are considered to be exposed; those translated at a historical (prechange) exchange rate will maintain their historic headquarter currency values and, hence, are regarded as not exposed. Translation exposure is simply the difference between exposed assets and exposed liabilities. The controversies among accountants center on which assets and liabilities are exposed and when accounting-derived foreign exchange gains and losses should be recognized (reported on the income statement). The significance of translation exposure depends upon how the company's reported results are evaluated by the investment community, shareholders, financial institutions, and so on. It should be also noted, as already mentioned above, that in the case of translations, the gains or losses are "paper" or "virtual"; translation exposure does not affect cash flows directly. In contrast, in the case of transactions, the gains and losses are real (Robock & Simmonds, 1989, p. 557; Cavusgil, Knight & Riesenberger, 2008, p. 593).

The relevance of translation exposure can be argued based on cash flow perspective or a stock price perspective. Translation of financial statements for consolidated reporting purposes does not affect an MNE's cash flow by itself. The subsidiary earnings do not actually have to be converted into the parent's currency. If a subsidiary's local currency is currently weak, the earnings could be retained or reinvested in the subsidiary's country. However, MNE's parent will expect some of remittances in the future. To the extent that today's forward rate serves as a forecast of the spot rate that will exist when earnings are remitted, a weak currency today results in a forecast of a weak exchange rate at the time that earnings are remitted. In this case, the expected future cash flows are affected by the prevailing weakness of the foreign currency. Many investors also tend to use earnings when valuing companies in order to derive a value per share of stock. Since an MNE's translation exposure affects its consolidated earnings, it can affect the MNE's valuation (Madura, 2006, p. 317).

Some MNEs are subject to a greater degree of translation exposure than others are. An MNE's degree of translation exposure is dependent on the following (Madura, 2006, p. 317-318):

- The proportion of its business conducted by foreign subsidiaries – The greater the percentage of an MNE's business conducted by its foreign subsidiaries, the larger the percentage of a given financial statement item that is susceptible to translation exposure.
- The locations of its foreign subsidiaries – The locations of subsidiaries can also influence the degree of translation exposure because the financial statement items of each subsidiary are typically measured by the home currency of the subsidiary's country.
- The accounting methods that it uses – An MNE's degree of translation exposure can be

greatly affected by the accounting procedures it uses to translate when consolidating financial statement data.

2.4 External FX risk management methods

Techniques to minimize exposure to FX risk center around the concept of hedging. It refers to efforts to compensate for a possible loss from a bet or investment by making offsetting bets or investments. In international business, hedging refers to usage of financial instruments and other measures to reduce or eliminate exposure to FX risk. Hedging allows the company to limit potential losses by locking in guaranteed foreign exchange position. If the hedge is perfect, the company is protected against the risk of adverse changes in the price of a currency (Cavusgil, Knight & Riesenbergl, 2008, p. 597). For companies, there are number of external methods to use for the management of currency risk, namely the use of financial derivatives. Financial market hedging instruments include:

- futures hedge,
- forward hedge,
- money market hedge,
- currency option hedge,
- currency option strategies.

2.4.1 Futures hedge

A currency futures contract is a commitment to deliver a specific amount of a specified currency at a specified date for an agreed price incorporated in the contract. The futures perform a similar function to a forward contract, but it has some major differences. When a company purchases currency futures, it tries to hedge a payment on future payables in a foreign currency. By holding this contract, it locks in the amount of its home currency needed to make the payment in the near future. The company insulates the value of its future payments from the fluctuations in the foreign currency's spot rate over time (avoidance of possible home currency depreciation). On the other hand, when a company sells a currency futures contract, it is entitled to sell a specified amount in a specified currency for a stated price on a stated date. With selling of futures, a company hedges the home currency value of the future receivables in a foreign currency and therefore avoids possible appreciation of home currency (Madura, 2006, p. 329–330).

2.4.2 Forward hedge

The forward contract is commonly used for large transactions and is tailored to a company and negotiated between it and a commercial bank. An MNE that needs a foreign currency in the future can negotiate a forward contract to purchase the currency forward, thereby locking in the exchange rate at which it will obtain the currency on a future date. The same is applied for selling foreign currency in the future, where company locks in the exchange rate at which they sell the currency on a future date (Madura, 2006, p. 330).

2.4.3 Money market hedge

A money market hedge involves taking a money market position to cover future payables or receivables position. If a company has excess cash, it can create a short-term deposit in the foreign currency that it will need in the future. In many cases, MNEs prefer to hedge payables without using their cash balances. A money market hedge can still be used in this situation, but it requires two money market positions: borrowed funds in the home currency and a short-term investment in the foreign currency. If a company expects receivables in a foreign currency, it can hedge this position by borrowing the currency now and converting it to a needed currency. The receivables will be used to pay off the loan. In some cases, MNEs may not need to borrow funds for a period, which is proposed by a bank from which the company will borrow the money. In these situations, a money market hedge can still be used to hedge receivables if the company takes two positions in the money markets: borrow the foreign currency representing future receivables and invest in the home currency (Madura, p. 335).

2.4.4 Currency option hedge

As already explained in the previous part, a currency option hedge gives the owner a possibility and not an obligation to buy (call option) or sell (put option) a specified amount of a particular currency at a specified price within a given period of time.

In the case of a call option, if the spot rate of the currency remains lower than the exercise of the option throughout the life of the option, a company can let the option expire and simply purchase the currency at the existing spot rate. On the other hand, if the spot rate of the currency appreciates over time, the call option allows a company to purchase the currency at the exercise price. That is, if a company owning a call option has locked in a maximum price (the exercise price) to pay for the currency. The same flexibility is applied also to put option, which a company can use to hedge future receivables. The put option, which provides selling a specified amount in a particular currency at a specified price (exercise price) within a given period of time, therefore locks in minimum price (exercise price) to sell the currency (Madura, 2006, p. 336-338).

Usually there is availability of several alternative currency options that have different exercise prices. With this possibility, a company can reduce premium paid by choosing call option with higher exercise price or put option with lower exercise price. Nevertheless, the tradeoffs are that the maximum amount to be paid for the payables will be higher or on the other hand the minimum amount to be received from the receivables will be lower (Madura, 2006, p. 345).

2.4.5 Currency option strategies

Besides deciding on a single currency option as hedging technique, companies have the

possibility to choose from a variety of option strategies. The option strategy constitutes of different types of options. When selling an option, the seller receives the premium, and when buying an option, the buyer must pay the premium on that option. The option strategies therefore allow the company to nullify corresponding premiums and pay no premium at all. Some of the most frequently used combinations of options are (Learning about options, 2011):

- Straddle – holding a position in both a call and put with the same strike price and expiration. If the options have been bought, the holder has a long or bottom straddle. If the options were sold, the holder has a short or top straddle. The long straddle is used if there is an expected increase in volatility of an underlying item, while short straddle is used in the case of a expected reduction in volatility of the hedging asset.
- Strangle – the strategy is alternative to long or bottom straddle. It consists of simultaneous buying or selling of an out-of-the-money put and an out-of-the-money call option, with the same expiration dates but different strike prices.
- A knock out option is a simple option that automatically terminates spot trades at or beyond a defined barrier (established out of the money in relation to spot) before expiry. The closer the knock out (KO) level is to the spot rate, the less expensive it is as the probability that the barrier will be reached is increased.
- A knock in option is an inactive simple option that automatically becomes live if spot trades at or beyond a defined barrier (established out of the money in relation to spot) before expiry. The closer the knock in (KI) level is to the spot, the more expensive it is as the probability that the barrier trades, and thus creating a simple style option, is increased.
- Risk reversal - consists of being long (buying) an out of the money call and being short (i.e. selling) an out of the money put, both with the same maturity. This strategy protects against unfavorable, downward price movements but limits the profits that can be made from favorable upward price movements.

2.4.6 Comparison of external hedging techniques

The basic difference between hedging techniques results in comparison of possible outcome of their usage. When using a futures hedge, forward hedge or money market hedge, a company can estimate the funds (denominated in its home currency) that it will need for future payables, or the funds that it will receive after converting foreign currency receivables. Thus, it can compare the costs or revenue and determine which of these hedging techniques is appropriate. In contrast, with currency option hedge a company needs to forecast cash flows from option hedge based on possible exchange rate outcomes since the costs of purchasing payables and the revenue generated from receivables are not known ahead of time (Madura, 2006, p. 338).

There exists the possibility that payables currency can depreciate or a receivables currency can appreciate over the hedged period when techniques such as the forward hedge and money market hedge are used. An unhedged strategy would in such situations outperform both techniques. Therefore, currency option could be in some situations more useful, especially

when a company wants to insulate itself from adverse exchange rate movements or when it can benefit from favorable exchange rate movements. However, a company must assess whether the advantages of a currency option hedge are worth the price (premium) paid for it (Madura, 2006, p. 336).

There also exists the possibility to remain unhedged but it is based on a company's degree of risk aversion. Companies with greater desire to avoid risk will hedge their open positions in foreign currencies more often than companies that are less concerned about risk. The decision whether to hedge a position with a forward contract or keep it unhedged can be made by comparing the known results of hedging to the possible results of remaining unhedged. The comparison of hedge-versus-no-hedge is achieved through estimating real cost of hedging (RCH) payables or receivables and cannot be determined until the payables and receivables period is over (Madura, 2006, p. 330–333).

The use of forward contracts is ideal when the exposure has a straight risk-reward profile. This means that forward contract gains or losses are exactly offset by losses or gains on the underlying transaction. If the transaction exposure is uncertain, however, because the volume or the foreign currency prices of the items being bought or sold are unknown, a forward contract will not match it. By contrast, currency options are a good hedging tool in situations in which the quantity of foreign exchange to be received or paid out is uncertain (Shapiro, 2004, p. 290-291).

Hedging entails various costs, such as bank fees and interest payments in the amount borrowed to carry the hedging transactions. The company must balance these costs against the expected benefits. In addition, the company can use active or passive hedging strategies. In passive hedging, each exposure is hedged as it occurs and the hedge stays in place until maturity. In active hedging, total exposure is reviewed frequently and the company only hedges a subset of its total exposures, usually those that pose the greatest potential harm. Hedges may be withdrawn before they reach maturity. Some active hedgers seek to profit from hedging, even to the point of maintaining active in-house trading desks. Most companies, however, are conservative in their approach. They simply try to cover all exposures – or their most important ones – and the hedges stay in place until maturity. They do not try to generate profits from speculation (Cavusgil, Knight & Riesenberg, 2008, p. 597).

2.5 Internal FX risk management methods

When transaction exposure exists, the company faces three major tasks. Firstly, it must identify its degree of transaction exposure. Secondly, it must decide whether to hedge this exposure. Finally, if it decides to hedge part or all of the exposure, it must choose among the various hedging techniques available. Before an MNE makes any decision related to hedging, it should identify the individual net transaction exposure on a currency-by-currency basis. The term net here refers to consolidation of all expected inflows and outflows for a particular time and currency. Therefore, subsidiary's reports regarding its expected inflows and outflows are

of vital importance for final consolidation and identification of the expected net positions in each foreign currency during several upcoming periods. Each subsidiary may desire to hedge its net currency position in order to avoid the possible adverse impacts on its performance due to fluctuations in the currency's value. The overall performance of an MNE, however, may already be insulated by offsetting positions between subsidiaries. Therefore, hedging the position of each individual subsidiary may not be necessary (Madura, 2006, p. 328).

Beside usual and common hedging techniques against currency fluctuations, as mentioned and described in previous paragraphs, there exist also some alternative hedging methods. The alternatives serve in the cases when perfect hedge is not available (or is too expensive) to eliminate transaction exposure. Such methods are:

- leading and lagging,
- cross-hedging,
- currency diversification,
- netting,
- matching,
- currency risk sharing.

2.5.1 Leading and lagging

Leading and lagging strategies involve adjusting of timing of a payment request or disbursement to reflect expectations about future currency movements. Some authors classify this method among forms of speculation and state that speculators are usually wealthy individuals or companies rather than banks. However, anyone who has to make a payment in a foreign currency in the future can speculate by speeding up payment if he or she expects the exchange rate to rise and delaying it if he or she expects the exchange rate to fall, while anyone who has to receive future payment in a foreign currency can speculate by using reverse tactics (Madura, 2006, p. 350; Salvatore, 2007, p. 503).

2.5.2 Cross-hedging

Cross-hedging is a common method of reducing transaction exposure when currency cannot be hedged due to unavailability of forward contracts or other hedging techniques. In such cases, it should be identified which currency can be hedged and is also highly correlated with the currency that cannot be hedged. The effectiveness of this strategy depends on the degree to which these two currencies are positively correlated. The stronger the positive correlation, the more effective will be the cross-hedging strategy (Madura, 2006, p. 351).

2.5.3 Currency diversification

The third alternative technique is currency diversification, which can limit the potential effect of any single currency's movements on the value of an MNE. The exposure to exchange rate movements can be reduced when companies diversify their business among numerous

countries. Nevertheless, it is effective just in the case when currencies are not highly correlated with each other (Madura, 2006, p. 351).

2.5.4 Netting

The strategy of netting applies when the company and its foreign subsidiaries net off intra-organizational currency flows at the end of each period, leaving only the balance exposed to risk and hence in the need of hedging. The netting technique itself can be categorized into bilateral netting and multilateral netting. Bilateral netting applies when pairs of companies in the same group net off their own positions regarding payables and receivables, without the involvement of a central treasury. Multilateral netting is performed by a central treasury where several subsidiaries interact with the head office. The subsidiaries in multilateral netting are required to notify the treasury of the intra-organizational flows of receivables and payables, and again, a common currency is required (Pike & Neale, 1997, p. 467).

2.5.5 Matching

In some circumstances, an MNE may be able to modify its pricing policy to hedge against FX exposure. This means that companies strive to match its currency outflows by amount and timing with its expected currency outflows. Matching is a technique similar to netting, but involves third parties rather than the foreign subsidiaries (Pike & Neale, 1997, p. 468). Because the matching of inflows and outflows in foreign currencies does have its limitations, an MNE will normally be exposed to some degree of exchange rate risk and, therefore, should consider the various hedging techniques (Madura, 2006, p. 328–329).

2.5.6 Currency risk sharing

Another technique for minimizing transaction exposure, especially relevant for importers and exporters, is currency risk sharing. If a company is interested in maintaining a good business relationship with one of its suppliers, it must work with that supplier to assure it that it will not force all currency risk or exposure off on the other party on a continual basis. Exchange rate movements are inherently random; therefore, some type of risk-sharing arrangement may prove useful. Those arrangements have been in use for nearly 50 years on world markets. They became something of a rarity during the 1950s and 1960s, when exchange rates were relatively stable (under the Bretton Woods Agreement). However, with the return to floating exchange rates in the 1970s, companies with long-term customer-supplier relationships across borders returned to some old ways of keeping old friends. The basis behind these arrangements is the determined contractual range of exchange rate. If the exchange rate is within the contractual range on the payment date, an importing company agrees to accept whatever transaction exposure exists. If, however, the exchange rate falls outside of this range on the payment date, the contractual companies will “share” the difference (Czinkota, Ronkainen & Moffett, 2011, p. 590–591).

2.6 Economic exposure management

The economic exposure of individual companies is difficult to measure and is very subjective; for the most part, it is dependent on the degree of internationalization present in the company's cost and revenue structure, as well as potential changes over the long run. Some steps can be undertaken to prepare the company for the unexpected, especially since the impacts of economic exposure are as diverse as are the companies in their international structures. For prevention from those unexpected risks, the actions through diversification are mostly recommended (Czinkota, Ronkainen & Moffett, 2011, p. 591–592): diversification of operations and diversification of financing.

2.6.1 Diversification of operations

Table 1: How to restructure operations to balance the impact of currency movements on cash inflows and outflows

| Type of operation | Recommended action when foreign currency has a greater impact on cash inflows | Recommended action when foreign currency has a greater impact on cash outflows |
|---|--|---|
| Sales in foreign currency units | Reduce foreign sales | Increase foreign sales |
| Reliance on foreign supplies | Increase foreign supply orders | Reduce foreign supply orders |
| Proportion of debt structure representing foreign debt | Restructure debt to increase debt payments in foreign currency | Restructure debt to reduce debt payments in foreign currency |

Source: J. Madura, International financial management, 2006, Exhibit 12.4.

Diversification or restructuring of operations would allow the company to be desensitized to the impacts of any one pair of exchange rate changes. Although companies rarely diversify production location for the sole purpose of currency diversification, it is substantial additional benefit from such global expansion (Czinkota, Ronkainen & Moffett, 2011, p. 592). The restructuring involves shifting the sources of costs or revenue to other locations in order to match cash inflows and outflows in foreign currencies. Restructuring operations to reduce economic exposure is a more complex task than hedging any single foreign currency transaction. Managing economic exposure consists of developing a long-term solution because once the restructuring is complete; a company should reduce economic exposure over the long run. In contrast, the hedging of transaction exposure deals with upcoming foreign currency transaction separately. However, a company must take into account that the restructuring undertaken to reduce economic exposure can be very costly to reverse or eliminate. Therefore, a company must be very confident about the potential benefits before it decides to restructure its operations. When deciding how to restructure operations to reduce economic exposure, a company must address next issues regarding impact of foreign currency on cash inflows and outflows (Madura, 2006, p. 373–374):

- increase or reduction in new or existing foreign markets,

- increase or reduction of dependency on foreign supply,
- establishment or elimination of production facilities in foreign markets,
- increase or reduction in level of debt denominated in foreign currencies.

The assumed activities regarding above issues are presented in Table 1.

2.6.2 Diversification of financing

Diversification of financing serves to hedge economic exposure much in the same way as it does with transaction exposures. A company with debt denominated in many different currencies is sensitive to many different interest rates. If one country or currency experiences rapidly rising inflation rates and interest rates, a company with diversified debt will not be subject to the full impact of such movements. Purely domestic companies, however, are actually somewhat captive to the local conditions and are unable to ride out such interest rate storms as easily. It should be noted that diversification is a passive solution to the exposure problem. This means that without knowing when or where or what the problem may be, the company should simply spread its operations and financial structures out over a variety of countries and currencies (Czinkota, Ronkainen & Moffett, 2011, p. 592).

In reality, most MNEs are not able to reduce their economic exposure since even an analysis of the income statement for an entire MNE may not necessarily detect its economic exposure. The reasons behind this are MNE's composition of various business units, different or even unique cost and revenue structure between units or different activities of company's business units. Although an MNE is mostly concerned with the effect of exchange rates on its performance and value overall, it can more effectively hedge its economic exposure if it can pinpoint the underlying source of the exposure. Yet, even if an MNE can pinpoint the underlying source of the exposure, there may not be a perfect hedge against that exposure. The solution for reduction of economic exposure presents a combination of different actions, already mentioned and explained above (Madura, 2006, p. 376).

2.7 Translation exposure management

Despite the fact that translation exposure is "virtual", an MNE can hedge against it using three available methods:

- adjusting fund flows,
- entering into forward contracts,
- exposure netting.

2.7.1 Fund flows adjustment

Funds adjustment involves altering either the amounts or the currencies of the planned cash flows of the parent or its subsidiaries (or both) to reduce the company's local currency accounting exposure. If the local currency devaluation is anticipated, direct funds-adjustment

methods include pricing exports in hard currencies and imports in the local currency, investing in hard currency securities, and replacing hard currency borrowings with local currency loans. The indirect methods include adjusting transfer prices on the sale of goods between affiliates, speeding up the payment of dividends, fees and royalties, and adjusting the leads and lags of inter-subsidiary accounts (Shapiro, 2004, p. 291–293; Madura, 2006, p. 382).

2.7.2 Forward contracts

The usage of forward contracts or futures contracts specifically means selling the currency forward that their foreign subsidiaries receive as earnings. In this way, an MNE creates a cash outflow in the currency to offset the earnings received in that currency (Shapiro, 2004, p. 291–293; Madura, 2006, p. 382).

2.7.3 Exposure netting

Exposure netting is an additional exchange-management technique that is available to multinational companies with positions in more than one foreign currency or with offsetting positions in the same currency (Shapiro, 2004, p. 291–293; Madura, 2006, p. 382).

2.7.3 Limitations of hedging

Beside possibilities, there exist also four limitations of hedging translation exposure (Madura, 2006, p. 382–383):

- Inaccurate earnings forecasts – A subsidiary's forecasted earnings for the end of the year are not guaranteed.
- Inadequate forward contracts for some currencies – Forward contracts are not available for all currencies. Thus, an MNE with subsidiaries in some smaller countries may not be able to obtain forward contracts for the currencies of concern.
- Accounting distortions – The translation losses are not tax deductible, whereas gains on forward contracts used to hedge translation exposure are taxed.
- Increased transaction exposure – With hedging strategy (forward or money market hedge) on translation exposure an MNE may be increasing its transaction exposure. For example, in the situation where the subsidiary's currency appreciates during fiscal year that results in a translation gain. If an MNE enacts a hedge strategy at the start of the fiscal year, this strategy will generate a transaction loss that will somewhat offset the translation gain.

3 A CASE OF MANAGING FX EXPOSURE IN SELECTED COMPANY

3.1 The firm's core activities

The firm is a fairly new company on Slovenian electricity market and is already distinguished as the fastest growing electricity trading and sales company in Slovenia. In 2009, the company joined the ranks of the most successful electricity trading companies in Central and Southeast Europe. Its business group is now the second-largest balance group on the Slovenian electricity market with an increasingly strong presence on regional southeast European markets. It has two organizational units in Slovenia and a network of subsidiaries abroad. The subsidiaries are all fully owned by the parent company. Its activities include (The Firm, 2010):

- the purchase of electricity from producers,
- electricity trading,
- sale of electricity to end-customers.

The majority of trading activities within the business group are carried out by the parent company through one of its organizational units. The unit coordinates trading activities on all markets where the firm is present from one central location. Access to international markets allows the firm to optimize the utilization of cross-border paths that connect sources and consumption units, enabling them to manage risks more easily, and fully comply with all contractual obligations that arise from electricity sales and purchases (The Firm, 2010).

Another organizational unit is involved in purchasing and selling electricity in Slovenia, and has recently begun setting up and coordinating retail electricity sales on foreign markets as well (The Firm, 2010).

The firm has been, from its beginning, extending its business presence also to foreign countries through establishment of subsidiaries. The principal activity of subsidiaries is electricity trading and their operations are therefore centralized and connected to one of the parent company's organizational units (The Firm, 2010).

The indicator of the firm's steady and robust growth is the employment growth index, which has been rising in a line with plans and expansion of its operations. The number of employees rose by more than 50 % in 2008 and 2009. At the end of 2009, the group had 83 employees. In the course of the year 2010, 28 new employees were hired and the firm passed the number of 100 employees, resulting in 101 employees at the end of 2010. The majority of employees work for the firm's parent company, while the rest are employed at foreign subsidiaries (The Firm, 2011). The growth in the number of employees and the growing volume of operations reflect the position of the firm in the country's size classification. The firm is now ranked in the category of medium-sized enterprises, according to the Companies Act of Slovenia (The

National Assembly of the Republic of Slovenia, 2006).

3.2 The firm's business performance

3.2.1 Business performance's indicators

The trading activity of the firm and the subsidiaries is divided into selling and buying of electricity. In 2009, the firm sold a total of 8,172 GWh of electricity, of which 2,246 GWh were sold in Slovenia and the remaining 5,926 GWh in the 14 foreign markets where the firm operates. The quantities of electricity sold by the firm grew by 64 % in 2009 compared to a year earlier and even by 140 % when just sale activities abroad are taken into account. On the other hand, electricity was purchased mostly in Slovenia (2,556 GWh), Austria and Germany (2,712 GWh) and Hungary (1,074 GWh) (The Firm, 2010).

2010 was for the firm another successful and productive year in terms of traded electricity. The company increased its traded quantities by 59 %, compared to a year earlier. In 2010, the firm sold a total of 15,067 GWh of electricity within the group, of which 5,293 GWh were sold in Slovenia and the remaining 9,773 GWh in foreign markets. The firm's sold quantities therefore grew, compared to year 2009, by 84 % in total and by 65 % when just sale activities abroad are taken into account. On the other hand, purchase of electricity was also increased and done mostly in Austria and Germany (3,302 GWh), Bulgaria (2,184 GWh), and Hungary (1,182 GWh) (The Firm, 2011a).

Cross-border transmission capacities (hereinafter: CBTCs) are, beside electricity, an important component in international electricity trading. In 2009, the company acquired a total of 12 TWh of cross-border transfer capacities for borders between the 15 European markets. In 2010, the firm increased its amount of obtained cross-border capacities to 17 TWh and recorded a growth of 42 %, compared to a year earlier. Cross-border transmission capacities were obtained using market mechanisms such as auctions organized by transmission system operators on individual markets. These capacities are the necessary basis for accessing cheaper electricity on the purchase side and higher-priced markets on the sales side (The Firm, 2010).

In addition to increased trading quantities, the company also significantly increased the volume of operations involving derivative financial instruments in order to manage market risks more efficiently and ensure price stability of the portfolio. For this purpose, it used mainly standardized financial products of the German EEX Energy Exchange and signed bilateral financial contracts with a growing number of partners. In addition to hedging against price changes, the company was also present on foreign currency markets to ensure adequate hedging against currency fluctuations (The Firm, 2010).

3.2.2 Business activities in the light of FX exposure

The firm is mainly exposed to FX risk when conducting its core activities, i.e. electricity trading and cross-border capacity trading, and also in regard to loans and participating interests held in foreign subsidiaries (The Firm, 2010). The company is currently present on markets of central and southeast Europe: Germany, Austria, Czech Republic, Hungary, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Macedonia, Albania, Greece, Bulgaria, Romania and disputed territory of Kosovo.

The euro is the common currency in Germany, Austria, Italy, Slovenia and Greece and it plays an important role for the economies and economic policies of South Eastern European countries. Montenegro, Albania and disputed territory of Kosovo have adopted the euro as their legal tender, while Bulgaria and Bosnia and Herzegovina run currency boards (Barisitz, 2005, p. 432). In the first three countries, the euro is a medium of payment allowed by law, while Bulgaria and Bosnia and Herzegovina have a monetary authority, which is required to maintain a fixed exchange rate with a foreign currency. In their case, the foreign currency is the euro and the exchange rate is 1.95583 of local currency for 1 EUR. The up-front costs of doing business in Bulgaria and Bosnia and Herzegovina are therefore known at the point when the deals are concluded.

The firm has just few trading partners in Macedonia and Croatia; these two countries mainly serve as transit countries and the firm is thus exposed to currency fluctuations in case of obtained CBTCs. Trading activities in Czech Republic are currently directed just to trading with standardized products with secured settlement on Power Exchange Central Europe (About PXE, 2011), which are conducted in an euro-denominated contracts.

Therefore, the firm is actually exposed to the purchase or sale activities when trading with partners in Hungary, Serbia and Romania; and when business contracts do not use currency clauses. The currency clause is used in Serbia with some trading partners. A currency clause is agreed between trading partners within a contract and it serves to avoid problems of payment caused by the exchange rate changes. In the contract, the clause fixes the exchange rate in advance for the various transactions covered by the contract (Currency clause, 2011). Nevertheless, the firm conducts energy deals in Serbia mostly for few months in advance, for next month or next quarter at farthest. The firm's FX exposure in Serbia is a result of trading with partners, which do not use currency clauses and when a netted difference occurs after the firm completes all deals for delivery in the next months or a quarter.

Next important segment in the light of FX exposure are obtained CBTCs. When purchasing CBTCs, the firm might be exposed due to obtained capacities in Croatia, Romania, Serbia, Macedonia and Hungary. CBTCs are most commonly granted at auctions, held by a country's transmission system operators, like ELES in Slovenia, HEP in Croatia, EMS in Serbia, etc. Yearly CBTCs are awarded at the end of the year for the coming year, monthly CBTCs in the month previous to the delivery month and daily CBTCs on a daily level, one or two days

before usage of gained CBTCs takes place. In the mentioned countries, except Croatia, bidding at auctions is done in euro-denominated bids, while payments in all countries are carried out in the home currency. The invoices for payment of gained yearly and monthly CBTCs are mostly paid a few days before delivery. Daily capacities must be paid in the first days of a month for the previous month. Consequently, there are just a few days between conduct of auctions for capacities and payment date, except for yearly capacities, where conduct date and payment date can be several months apart. Therefore, the firm's FX exposure for obtained daily or monthly CBTCs is assessed as low or insignificant compared to exposure due to obtained yearly CBTCs.

To summarize, the firm is in the case of energy deals thus exposed to currency fluctuations in Romania and Hungary, and in Serbia when currency clauses are not used. In the case of CBTCs, the firm's exposure is sensitive when the firm possesses yearly CBTCs, gained at auctions in Croatia, Romania, Serbia, Macedonia and Hungary.

3.2.3 Volatility and correlation coefficients of relevant foreign currencies

The reasons behind the firm's FX exposure are fluctuations in exchange rates. The euro is the principal currency of the firm. The most important foreign currencies for the firm in the net terms of the volume of operations are the Serbian dinar (RSD), the Hungarian forint (HUF), the Croatian kuna (HRK), and the Romanian leu (RON).

Before the calculation and presentation of three exposures (transaction, economic and translation) of the firm, I will in next paragraphs firstly present basic information regarding the most relevant currencies from the firm's exposure perspective.

According to last Classification of exchange rate arrangements and monetary policy frameworks of International Monetary Fund (2008), Croatia implements the exchange rate regime of a conventional fixed peg arrangement and has the euro as an exchange rate anchor. The monetary authority, the Croatian National Bank, prevents too excessive exchange rate fluctuations by occasional market interventions in an attempt to maintain relative stability of the exchange rate. The exchange rate of the Kuna against the German mark and the euro fluctuated within a narrow band of $\pm 6\%$ around the average exchange rate in the period from kuna introduction on 30 May 1994 until present time (O tečaju kune, 2011). The exchange rate policy can be thus characterized as a corridor around the hypothetical central rate of 7.5 HRK/EUR.

Hungary in the 1990s initially opted for a crawling peg in which HUF was pegged to the basket made up of ECU (70 %) and USD (30 %) and allowed to fluctuate within a narrow band $\pm 2.25\%$ around the gradually devaluating central rate. In January 2000, the currency basket was substituted by the euro; and the bandwidth was widened to $\pm 15\%$ in May 2001. The crawling band was abandoned in October 2001. Since then, Hungary has adopted a fixed parity regime against the euro with $\pm 15\%$ margin along with the inflation targeting strategy.

On 26 February 2008, however, the National Bank of Hungary introduced free floating as the new official exchange rate arrangement (Stavárek, 2009, 169), while the monetary policy regime continues to pursue the inflation targeting strategy (IMF, 2008).

Romania used a managed floating regime for a long period of time to drive nominal depreciation of RON. This arrangement was sometimes characterized as de facto implicit crawling band. USD was the reference currency until the end of 2001. Over the period 2002–2004 RON was linked to a EUR/USD basket. The euro has been the only reference currency since early 2005. In August 2005, National Bank of Romania started with implementation of inflation targeting and loosening of the managed floating regime (Stavárek, 2009, 169). The National bank of Romania is stating (Exchange rate regime of the leu, 2011) that the current exchange rate regime of the leu is that of a managed float, which is in line with using inflation targets as a nominal anchor for monetary policy and is allowing for a flexible policy response to unpredicted shocks likely to affect the economy.

Serbia in the 1990s had a fixed exchange rate regime without full convertibility. And, as is easily understood, a fixed exchange rate without full convertibility easily creates a “black” market for foreign currency. Therefore, Serbia had two foreign exchange markets. On the official foreign exchange market there was a fixed exchange rate and the central monetary authority controlled the currency trade. On the “black” market, the exchange rate was a result of the supply and demand of both the national currency (dinar) and foreign currencies (mostly German mark). In 2000, following political changes, Serbia devaluated the dinar from 6 to 30 dinars per German mark and announced that they managed to officially float the exchange rate regime (Miljković & Vučković, 2006, 249–250). Serbia has currently, similar as Romania, a managed floating exchange rate regime for the dinar from 2008 on. The central bank has taken preliminary steps toward inflation targeting and transition to a full-fledged inflation targeting (Decision on the dinar exchange rate regime, 2011).

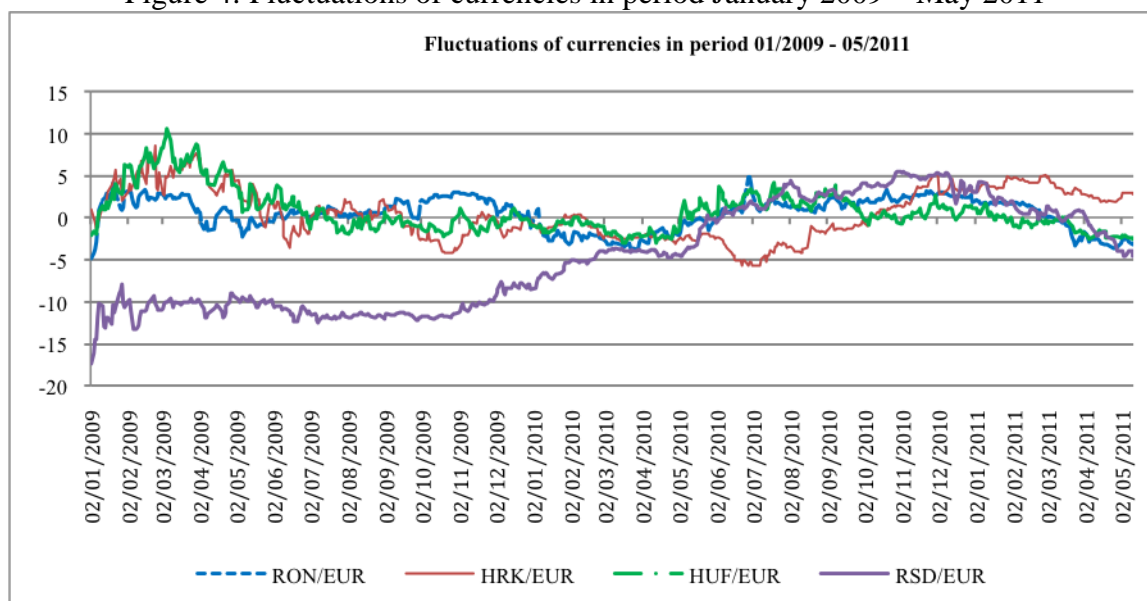
As we can conclude, neither of the mentioned currencies is exclusively determined with free-floating exchange rate through FX market demand and supply. All currencies are local and minor currencies in the FX world, and therefore national banks constantly intervene when the change of exchange rate is substantial.

Figure 4 is showing movements of the four currencies’ exchange rates against the euro in the last two years and a half while Table 2 reports on volatility exchange rates for last five years (for Figure 4 I limited the period due to presentation reasons).

The currency’ fluctuations in Figure 4 are presented with standardized values for the purpose of easier comparison. The exchange rates’ values were standardized using the theoretical (population) mean and a standard deviation. We can see from the figure that HRK/EUR and HUF/EUR exchange rates were floating in similar direction with some deviations in period from January 2009 until June 2010, while from June 2010 on RON/EUR, HUF/EUR and RSD/EUR synchronized its movements. On the other hand, the RSD/EUR exchange rate had

until June 2010 unique movement, while from June 2010 on the HRK/EUR is expressing its own, depreciation-oriented movement.

Figure 4: Fluctuations of currencies in period January 2009 – May 2011



Source: *The Firm, Internal review on banking's data, 2011f, own calculation and presentation.*

Table 2 presents the calculated volatility of exchange rates for four relevant currencies in past five years. The most widely used measure of exchange rate volatility is the standard deviation of the first difference of logarithms of the exchange rate. This measure has the property that it will equal zero if the exchange rate follows a constant trend, which presumably could be anticipated and therefore would not be a source of uncertainty (Clark, Tamirisa & Shang-jin, 2004, p.30). Proxy for the nominal exchange rate uncertainty is thus measured as standard deviation of the first difference of the logarithmic exchange rate based on daily central bank middle exchange rates. The standard deviation is calculated over a five-year period, as an indicator of long-run variability. The most volatile on daily level is HUF/EUR exchange rate, while HRK/EUR had minor daily percentage changes.

Table 2: Volatility of currencies

| Currency | Currency's mean over last five years – 2006–2011: | Standard deviation over last five years – 2006–2011: |
|------------------|---|--|
| Romanian leu | 3.8260 | 0.0020 |
| Croatian Kuna | 7.3089 | 0.0007 |
| Hungarian forint | 264.99 | 0.0032 |
| Serbian dinar | 89.48 | 0.0021 |

Source: *The Firm, Internal review on banking's data, 2011f, own calculation of currencies' volatility.*

The volatility of exchange rates is of vital importance for decision-makers and risk managers, in order to decide and choose the most appropriate hedging techniques, accordingly to open positions and overall company's exposure.

Yet another important aspect, which should be considered when company manages the portfolio of currencies, are correlations between different currencies. Therefore, Table 3 reports of correlation coefficients between Romanian leu, Croatian Kuna, Serbian dinar and Hungarian forint.

The correlation coefficients are calculated based on the covariance of the samples and the standard deviations of each sample. As stated in the Table 3 the correlations among exchange rates of RON, HUF, HRK and RSD are between 0.00 and 0.50, which means that currencies have positive but low correlation. This indicates that RON, HUF, HRK and RSD move in the same direction against the euro but with relatively low degree of co-movement.

Table 3: Correlation coefficients among exchange rate movements

| CORRELATIONS | RON | HRK | HUF | RSD |
|--------------|------|------|------|------|
| RON | 1.00 | | | |
| HRK | 0.07 | 1.00 | | |
| HUF | 0.45 | 0.11 | 1.00 | |
| RSD | 0.19 | 0.09 | 0.22 | 1.00 |

Source: The Firm, Internal review on banking’s data, 2011f, own calculation of correlation coefficients.

The thesis will, in next subchapters, devote attention to analysis of risk detection, evaluation of FX exposure and assessment of managing of exposures due to currency fluctuations, based on performance data and indicators of one of the firm’s organizational units (the one that deals with electricity trading) and its subsidiaries. Despite this selection, I will still use the term *the firm*, but there should be an awareness that data is explicitly taken from performance of organizational unit, which deals with electricity trading, and from its subsidiaries.

3.3 The firm’s risk detection

The firm in its annual reports states that is exposed to many different risks, such as financial risks (managing liquidity and credit risks), market risks (managing open position in portfolios; price, currency, interest-rate, quantity, quantity-liquidity risks) and operational risks (human resources, legal, IT, regulatory risks). It also provides a description of all major and identified risks, methods for measuring them, and responsibilities and activities used to manage them.

The tool used for the purpose of evaluation of risks is the risk assessment matrix and is a graphic depiction of the estimated probability of events and the estimated amount of damage or loss of economic benefits. It represents an important part of the general risk management policy of the firm. Based on these estimates, the firm sets risk management priorities and defines the most suitable measures. Owing to the regular implementation of risk management measures, the firm was able to set up highly effective processes for managing all of the above risks, maintaining them within acceptable parameters (The Firm, 2010).

The codes contained in the matrix determine the classification of risks into basic categories,

where “F” means financial risks, “M” means market risks, and “O” means operative risks. The most critical events from the firm’s risk detection perspective are “M4” and “M5”, which corresponds to market risks. The “M4” presents the risk associated with production volumes, while “M5” present significant (unexpected and sudden) changes in electricity prices. Both risk factors have the possibility of causing significant damage in the business year, which can result in a loss of up to 5 million EUR. The probability of such events is assessed to be 20 % (medium) and may occur no more than 50 times per 250 events. The same probability, but with expected lower damage in the business year, is applied also to the next risk factors: “M7” – significant interest-rate changes, “M8” – significant change in guarantee fees, “F1” – risk of non-payment by end-customers, “M6” – significant changes in foreign currency, “M9” – risk of consumption quantities in open contracts, “M11” – changed market depth due to changes in market conditions, “O17” – loss of key employees. On the other hand, the same (significant) damage (up to 5 million EUR) applies also to “O14” – failure of IT equipment and connections, but has very low probability. It can happen in no more than 12 times per 250 events (The Firm, 2010).

Table 4: Risk assessment matrix of the firm

| | | DAMAGE IN BUSINESS YEAR | | | |
|--------------------|---|--------------------------------|-------------------------|----------------------|----------------------|
| | | MINOR | MODERATE | SIGNIFICANT | SEVERE |
| | | Loss up to 0.5 mio EUR | Loss up to 2.5 mio EUR | Loss up to 5 mio EUR | Loss up to 5 mio EUR |
| PROBABILITY | HIGH more than 20% more than 50 times per 250 events | | | | |
| | MEDIUM up to than 20% no more than 50 times per 250 events | M7, M8 | F1, M6, M9, M11, O17 | M4, M5 | |
| | LOW up to 10% no more than 25 times per 250 events | | F2, O13, O15 | | |
| | VERY LOW up to 5% no more than 12 times per 250 events | F3, O19, M10, O20 | O12, O16, O18 | O14 | |

Note: - F = Financial risks; - O = Operative risks; - M = Market risks; - M6 = Significant changes in foreign currency.

Source: The Firm, Annual report for the 2009 business year, 2010, Risk assessment matrix.

As can be seen from the Table 4, the currency risk (M6) is assessed to have medium probability for possible emergence and in the case of appearance; it can cause moderate damage in one business year, which is assessed with the loss up to 2.5 million EUR.

3.4 The firm's FX risk exposure

The firm is subject to constant changes and fluctuations of electricity prices and prices of CBTCs in the light of a FX risk. The next sections will evaluate the firm's currency exposure and analyze used hedging techniques and give some further recommendations regarding hedging all three types of FX exposure.

3.4.1 Transaction exposure

For an assessment of transaction exposure, to which the firm is subjected I will calculate its net cash flows in each currency and measure the potential impact of the currency exposure. One of the relevant methods for measuring transaction exposure is also the Value-at-risk method.

3.4.1.1 Estimation of net cash flows of the firm

Focusing on transaction exposure is relevant especially for an upcoming short-term period (such as the next month or quarter) for which the company has known, contractually binding future foreign currency-denominated cash flows. To measure its transaction exposure, a company needs to project the consolidated net amount in currency inflows or outflows, categorized by the currency. The consolidated net cash flows help determine a company's overall position in each currency.

The firm's cash flow constitutes from energy as well as CBTCs' contracts. The assessment of the firm's transaction exposure is prepared on basis of energy transactions only, since CBTCs present just a small percentage of total firm's cash flow.

Table 5 shows that there is an expected net cash inflow from energy deals for the determined quarter in all four currencies. The firm will be thus favorably affected by possible appreciation of all four currencies against euro.

The expected exchange rates in Table 5, except the rate for Serbian dinar, are forward exchange rates, which were in force at the end of June 2011 and as quoted and provided by one of the firm's operating banks. The expected exchange rate for Serbian dinar was calculated based on spot exchange rate of RSD/EUR as of 30th of June using the discount. The forward discount was derived from annualized interest rate differential between the Euro Area and Serbia, taking into account the number of days to delivery (90 days).

The calculated expected net cash inflows in EUR from energy deals, which the firm so far conducted for third quarter of 2011, are especially high in Romania (2,035,726 EUR), as consequence of predominant sales to partners.

Table 5: Consolidated quarterly net cash flow of the firm

| Currency | Total expected inflow for Q3 2011 [local currency] | Total expected outflow for Q3 2011 [local currency] | Net inflow or outflow in local currency [local currency] | Expected exchange rate [currency /EUR] | Spot exchange rate 30.6.2011 [currency/EUR] | Net inflow or outflow as measured [EUR] |
|------------------------|--|---|--|--|---|---|
| Croatian Kuna (HRK) | 1,617,592 | 1,594,597 | 22,995 | 7.4337 | 7.3774 | 3,093 |
| Serbian dinar (RSD) | 1,717,026,649 | 1,715,810,495 | 1,216,154 | 101.70 | 99.01 | 11,958 |
| Hungarian forint (HUF) | 2,129,439,454 | 2,120,348,811 | 9,090,643 | 270.50 | 265.57 | 33,607 |
| Romanian leu (RON) | 28,464,053 | 19,808,961 | 8,655,092 | 4.2516 | 4.1060 | 2,035,726 |

Source: The Firm, Internal review on consolidated net cash flow in 2010, 2011b.

On the other hand, net cash inflows are low in Serbia (11,958 EUR), Hungary (33,607 EUR) and Croatia (3,093 EUR) due to reasons of natural hedging or usage of currency clauses. The natural hedging means that the company tries to eliminate any possible exposure by the conduction of opposite (purchase/sale) contracts in a single currency, while currency clause that is negotiated within a contract, fixes the exchange rate of the deal and protects the company from the difficulties of payment caused by changes of exchange rates.

Table 6 is gathering range of estimated net inflows and outflows in the principal currency at the end of third quarter 2011. The estimated exchange rates are calculated on the basis of expected exchange rates, as in Table 5, taking into account currency volatility and 95 % confidence level.

Table 6: Estimating the range of the firm's net inflows or outflows

| Currency | Net inflow or outflow in local currency [local currency] | Range of estimated exchange rates [currency/EUR] | Range of estimated net inflows or outflows in EUR |
|------------------------|--|--|---|
| Croatian Kuna (HRK) | 22,995 | 7.41 - 7.46 | +3,103 – +3,084 |
| Serbian dinar (RSD) | 1,216,154 | 100.88 – 102.53 | +12,056 – +11,861 |
| Hungarian forint (HUF) | 9,090,643 | 266.48 – 274.52 | +34,113 – +33,115 |
| Romanian leu (RON) | 8,655,092 | 4.22 – 4.29 | +2,052,596 – +2,019,130 |

Source: The Firm, Internal review on consolidated net cash flow in 2010, 2011b.

The firm has net cash inflow in all four currencies and will be thus favorably affected when exchange rate of foreign currency against the euro appreciate. The firm is witnessing the

highest exposure with Romanian currency with the possible loss or profit up to app. 33,000 EUR (difference between 2,052,596 EUR and 2,019,130 EUR), according to depreciation or appreciation of exchange rate, respectively. Profit/loss that could arise when converting money flows from other three foreign currencies to principal currency is not significant, ranging up to 1,000 EUR.

It should be noted that the net inflows and outflows in principal currency, after conversion from foreign currencies, and the exchange rates at the end of the period are uncertain. Thus, it is reasonable for a company to develop a range of possible exchange rates for each currency, revising currency positions within a certain period and afterwards decide regarding additional hedging for lowering transaction exposure. In addition, the further into the future a company measures its transaction exposure; less accurate will be the measurements. Therefore, it is important that a company's overall exposure can be assessed only after considering each currency's variability and the correlations among currencies.

3.4.1.2 Measurement of the potential impact of the currency exposure

The net cash flows of the firm are viewed as a portfolio of currencies. The exposure of the portfolio of currencies can be measured by the standard deviation of the portfolio, which indicates how the portfolio's value may deviate from what is expected. The firm's exposure to multiple currencies is influenced by the variability of each currency and the correlation of movements between the currencies. The correlation coefficients between relevant currencies were already calculated and presented in one of the previous sections. Main finding was that all four currencies move in the same direction against the euro but with relatively low degree of co-movement.

Table 7: Impact of cash flow and correlation conditions on an MNE's exposure

| If the MNE's expected cash flow situation is: | And the currencies are: | The MNE's exposure is relatively: |
|--|--------------------------------|--|
| Equal amounts of net inflows in two currencies | Highly correlated | High |
| Equal amounts of net inflows in two currencies | Slightly positively correlated | Moderate |
| Equal amounts of net inflows in two currencies | Negatively correlated | Low |
| A net inflow in one currency and a net outflow of about the same amount in another currency: | Highly correlated | Low |
| A net inflow in one currency and a net outflow of about the same amount in another currency: | Slightly positively correlated | Moderate |
| A net inflow in one currency and a net outflow of about the same amount in another currency: | Negatively correlated | High |

Source: M. Madura, International financial management, 2006, Exhibit 10.4.

The firm has outstanding net inflow from Romanian currency for the third quarter of 2011.

Since Romanian FX position is already netted and neither of other three currencies has about the same net amount to undertake offsetting activities, the firm's exposure due to Romanian currency is relatively high.

Other three currencies also recorded net inflow for third quarter of 2011, but are rather small compared to RON. Serbian dinar and Hungarian forint have net inflow with approximate ratio 1:3 (12,000 EUR after converting from RSD and 34,000 EUR after converting from HUF). Since currencies are slightly positively correlated (0.22) the firm's exposure can be, according to Table 7, assessed as relatively low to moderate.

3.4.1.3 Assessment of transaction exposure based on Value-At-Risk

Another method for assessing exposure is the Value-At-Risk (VAR) method, which incorporates volatility and currency correlations to determine the potential maximum loss on the value of positions of a company that is exposed to exchange rate movements. The VAR method can be used to assess one-day loss on the value of the positions, to measure exposure over longer time horizons or to measure exposure of currency portfolio (Madura, 2006, p. 306–309). For the firm, the usage of VAR method is relevant for assessment of exposure over longer periods and of currency portfolio.

The firm will in the future settle net receivables in all four currencies, as already presented in Table 5 under the Net inflow or outflow in a local currency for Q3 2011. Before actual receivables the euro value of the four-currency portfolio is currently estimated to be approximately 2.1 million EUR (conversion based on expected exchange rates as in Table 5).

Table 8: VAR method for calculation of transaction exposure of the firm's four currencies' portfolio

| VAR method | Currency net inflows in EUR | Percentage value of portfolio | Standard deviation | Portfolio' standard deviation | Maximum one quarter loss |
|------------------------|-----------------------------|-------------------------------|--------------------|-------------------------------|--------------------------|
| Croatian kuna (HRK) | 3,093 € | 0.1 % | 0.96 % | 3.93 % | -6.49 % |
| Serbian dinar (RSD) | 12,044 € | 0.6 % | 4.11 % | | |
| Hungarian forint (HUF) | 33,607 € | 1.7 % | 4.73 % | | |
| Romanian leu (RON) | 2,035,726 € | 97.7 % | 3.99 % | | |

Source: The Firm, Internal review on consolidated net cash flow in 2010, 2011b.

Table 8 shows that Croatian currency presents the 0.1 % of the firm's total net inflow portfolio, Serbian dinar 0.6 % and Hungarian forint 1.6 %, while Romanian net inflow position presents 97.7 % of the overall portfolio. The data of exchange rates in last five years (2006–2011) estimate standard deviations of quarterly exchange rate changes to be 0.96 % for HRK and between 4 and 4.8 % for other three portfolio currencies. Under the assumptions of normal distribution and expected percentage change of 0 for each currency during next quarter, the calculated standard deviation of the firm's four-currency portfolio is 3.93 %.

If the quarterly percentage changes of each currency are normally distributed, then the quarterly percentage changes of the entire portfolio should be normally distributed accordingly. The maximum quarter loss of the currency portfolio is determined by the lower boundary of the probability distribution. Assuming an expected percentage change of 0 percent for each currency during the next quarter (and therefore an expected percentage change of zero for the portfolio), the maximum one-quarter portfolio's loss of the firm is -6.49 %, as stated in the Table 8. It means that if the firm does not hedge its four-currency portfolio and if fluctuation of currencies' exchange rate turns into unfavorable direction from the firm's perspective, the firm could loss up to 6.49 % of its portfolio value in one quarter. In case that maximum one-quarter loss occurs, than the firm might lose up to 135,282 EUR (-6.49 % x 2,084,470 EUR).

On the other hand, maximum one-quarter losses for individual currencies are even higher, except in the case of Croatian Kuna. The results are next:

- Croatian portfolio: maximum one-quarter loss is assessed to be -1.59 %, or based on upper amounts of net inflows: -49 EUR,
- Serbian portfolio: maximum one-quarter loss is assessed to be -6.78 %, or based on upper amounts of net inflows: -817 EUR,
- Hungarian portfolio: maximum one-quarter loss is assessed to be -7.81 %, or based on upper amounts of net inflows: -2,625 EUR,
- Romanian portfolio: maximum one-quarter loss is assessed to be -6.58 %, or based on upper amounts of net inflows: -133,950 EUR,
- Total maximum one-quarter loss: -137,441 EUR.

The maximum one-quarter loss of the four-currency portfolio is lower than the sum of maximum losses for either individual currency. This is attributed to the diversification effects. Therefore, the lower the correlation between the movements in the portfolio of currencies is, the greater are the diversification benefits.

3.4.2 Economic exposure

For assessment of the firm's economic exposure, I will use the method by which the sensitivity of earnings to exchange rates is measured. This method firstly classifies the cash flows into different income statement items and then subjectively predicts each income statement item based on scenario forecasts of exchange rates. By reviewing how the earnings forecast in the income statement changes in response to alternative exchange rate scenarios, the firm can assess the influence of currency movements on its earnings and cash flows.

The scenario exchange rates are based on quarterly trend of historical exchange rates and standard deviations for RON, HUF, HRK and RSD in past 5 years. All three scenarios are connected to current exchange rate as of 22nd of September 2011 of particular currency against the euro, since the meaning of measuring economic exposure is to assess sensitivity of future flows in different income statements on change of current and valid exchange rates

under the assumption that exchange rate can appreciate/depreciate substantially. The possible appreciation/depreciation of exchange rates for scenarios was calculated based on standard deviations and in accordance with normal distribution. The derived exchange rates for scenarios are therefore based on a 95 % confidence level.

The first scenario is based on current exchange rates, while exchange rates for the second two scenarios deviate from the current exchange rate for two standard deviations, either in positive or negative direction. The scenarios' exchange rates are gathered in Table 9, along with five-year quarterly moving averages and standard deviations for Hungarian, Serbian, Croatian and Romanian currency.

Table 9 shows that the quarterly moving averages of exchange rates in last five years clearly deviate from current exchange rate in all four currencies. RON and RSD recorded constant depreciation against the euro in past two years. Serbian dinar depreciated the most in year 2011; in April 2011 RSD even scored the exchange rate of 107.5 RSD/EUR. On the other hand, Croatian and Hungarian currencies move within certain bandwidth around the euro, but they did record substantial depreciation against the euro in the past few months. Croatian kuna dropped from 7.43 in June 2011 to 7.49 in September 2011, while Hungarian forint recorded a fall from 270.5 to 293.6 since June 2011.

Table 9: Indicators and used exchange rates for sensitivity scenarios of the firm's future cash flows

| | RON | HUF | HRK | RSD |
|--|------------|------------|------------|------------|
| Quarterly moving average of 2006-2011 | 3.82 | 265.1 | 7.30 | 89.2 |
| Standard deviation | 0.05 | 5.08 | 0.03 | 1.24 |
| Current exchange rate | 4.30 | 293.6 | 7.49 | 101.4 |
| Scenario 1 | 4.30 | 293.6 | 7.49 | 101.4 |
| Scenario 2 | 4.40 | 303.8 | 7.55 | 103.8 |
| Scenario 3 | 4.20 | 283.4 | 7.43 | 98.9 |

Source: The Firm, Internal review on banking's data, 2011f, own calculation of moving average.

Evaluation of the firm's economic exposure includes three sensitivity scenarios and compound of different income statement items. The first scenario gives actual market value as it was in September 2011 of the firm's anticipated future cash flows for different income statements for first quarter of 2012. The second scenario will provide assessment of sensitivity to possible depreciation of foreign currencies and scenario 3 to possible appreciation of those particular currencies.

The income statement items consist of two performance indicators: Revenue From Sales and Cost of Goods Sold. The item Costs, insensitive to exchange rate change, corresponds to costs of materials and labor. On the other hand, Costs, sensitive to exchange rate change, account for 0.5 % of total Costs of Goods Sold, what corresponds to purchases of goods for their further resale. Financing aspect is calculated with 7 % from net cash flow, which is derived from summing up performance indicators. To conclude, the FX sensitive income statement items are: both performance indicators, Costs, sensitive to exchange rate change and

Financing. Costs, insensitive to exchange rate change are denominated in parent currency and do not change with the firm's activity or fluctuation of exchange rates.

Table 10: The firm's income statements sensitivity scenarios by currency (denominated in 1000 EUR)

| SCENARIOS | RON | RON - 1 | RON - 2 | RON - 3 |
|----------------------------------|-------------|---------|---------|---------|
| Revenue From Sales | RON 27,883 | 6,491 | 6,337 | 6,652 |
| Cost of Goods Sold | -RON 27,209 | -6,334 | -6,184 | -6,491 |
| Operating Total | RON 674 | 157 | 153 | 161 |
| Costs, insensitive to exc.r.cha. | | -30 | -30 | -30 |
| Costs, sensitive to exc.r.cha. | -RON 136 | -32 | -31 | -32 |
| Operating Profit or Loss | RON 538 | 95 | 92 | 98 |
| Profit or Loss From Financing | RON 47 | 11 | 11 | 11 |
| Profit Before Tax | RON 585 | 106 | 103 | 110 |

| SCENARIOS | RSD | RSD - 1 | RSD - 2 | RSD - 3 |
|----------------------------------|----------------|---------|---------|---------|
| Revenue From Sales | RSD 2,587,298 | 25,526 | 24,916 | 26,167 |
| Cost of Goods Sold | -RSD 2,553,296 | -25,190 | -24,588 | -25,823 |
| Operating Total | RSD 34,002 | 335 | 327 | 344 |
| Costs, insensitive to exc.r.cha. | | -90 | -90 | -90 |
| Costs, sensitive to exc.r.cha. | -RSD 12,766 | -126 | -123 | -129 |
| Operating Profit or Loss | RSD 21,236 | 120 | 115 | 125 |
| Profit or Loss From Financing | RSD 2,380 | 23 | 23 | 24 |
| Profit Before Tax | RSD 21,236 | 143 | 137 | 149 |

| SCENARIOS | HUF | HUF - 1 | HUF - 2 | HUF - 3 |
|----------------------------------|----------------|---------|---------|---------|
| Revenue From Sales | HUF 7,752,342 | 26,404 | 25,521 | 27,351 |
| Cost of Goods Sold | -HUF 7,641,164 | -26,026 | -25,155 | -26,959 |
| Operating Total | HUF 111,178 | 379 | 366 | 392 |
| Costs, insensitive to exc.r.cha. | | -30 | -30 | -30 |
| Costs, sensitive to exc.r.cha. | -HUF 38,206 | -130 | -126 | -135 |
| Operating Profit or Loss | HUF 72,972 | 219 | 210 | 227 |
| Profit or Loss From Financing | HUF 7,782 | 27 | 26 | 27 |
| Profit Before Tax | HUF 80,755 | 245 | 236 | 255 |

| SCENARIOS | HRK | HRK - 1 | HRK - 2 | HRK - 3 |
|----------------------------------|-------------|---------|---------|---------|
| Revenue From Sales | HRK 77,692 | 10,378 | 10,295 | 10,463 |
| Cost of Goods Sold | -HRK 76,654 | -10,240 | -10,158 | -10,323 |
| Operating Total | HRK 1,038 | 139 | 138 | 140 |
| Costs, insensitive to exc.r.cha. | | -15 | -15 | -15 |
| Costs, sensitive to exc.r.cha. | -HRK 383 | -51 | -51 | -52 |
| Operating Profit or Loss | HRK 654 | 72 | 72 | 73 |
| Profit or Loss From Financing | HRK 73 | 10 | 10 | 10 |
| Profit Before Tax | HRK 727 | 82 | 81 | 83 |

Source: The Firm, Income statements 2010 for the firm's subsidiaries, 2011c.

Table 10 shows that the firm has anticipated more revenue than expenditure in the statement items regarding trading (Operating Total) in all four currencies for first quarter of 2012. The first column of each table reports on income statement items denominated in foreign

currencies, while other three columns show translated items into the firm's principal currency based on scenario's exchange rates as in the Table 9.

The first scenario, which is assessed according to the market with exchange rates as of 22nd of September 2011, gives next Profits Before Tax (second columns of the Table 10): RON 106,000 EUR, RSD 143,000 EUR, HUF 245,000 EUR and HRK 82,000 EUR. The possible depreciation of exchange rates of HUF, RSD, HRK and RON against the euro has negative effect on the firm's Revenue From Sales, but positive on firm's Cost of Goods Sold, as can be seen from the third columns of the Table 10 in comparison to the second columns of the mentioned table. Nevertheless, the positive effect of exchange rate depreciation on costs will not offset the reduced value of the firm's revenues. The Profit Before Tax would fall for 4.2 % in Serbia, for 3.7 % in Serbia and as much as 3 % in Romania. The lowest drop in Profit Before Tax will be recorded in Croatia, approximately 1.2 %. The overall Profit Before Tax in the case of depreciation of exchange rates is 558,000 EUR, what is approximately 3.1 % less profit than in the first scenario.

Table 10 exposes positive effect of exchange rates appreciation on the firm's anticipated revenue and negative on its costs. The effect is exactly the opposite to one of the second scenario. The rise in the revenue will be higher than the rise in the costs and the Operating Total would therefore increase, for 2.7 % in total. The variable expenses would also increase, since Costs of Goods Sold would be unfavorably affected by a stronger foreign currency. The overall Profit Before Tax in the third scenario for analyzed period would therefore be 596,000 EUR.

As can be seen from the Table 11 the firm has anticipated higher revenue than cost and when all four foreign currencies, which are taken into account, appreciate against the principal currency, the Profit Before Tax for the period would increase substantially.

Table 11: The firm's income statements sensitivity scenarios (denominated in 1000 EUR)

| SCENARIOS | SCENARIO 1 | SCENARIO 2 | SCENARIO 3 |
|----------------------------------|------------|------------|------------|
| Revenue From Sales | 68,799 | 67,069 | 70,632 |
| Cost of Goods Sold | -67,790 | -66,085 | -69,596 |
| Operating Total | 1,010 | 984 | 1,037 |
| Costs, insensitive to exc.r.cha. | -165 | -165 | -165 |
| Costs, sensitive to exc.r.cha. | -339 | -330 | -348 |
| Operating Profit or Loss | 506 | 489 | 524 |
| Profit or Loss From Financing | 71 | 69 | 73 |
| Profit Before Tax | 576 | 558 | 596 |

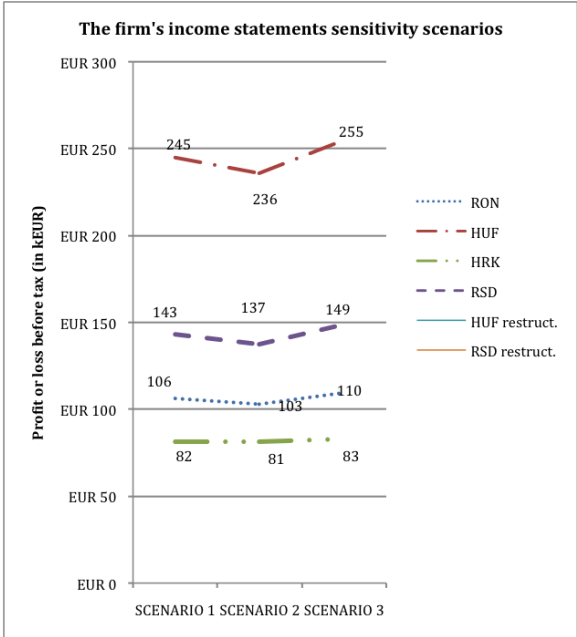
Source: The Firm, Income statements 2010 for the firm's subsidiaries, 2011c.

The scenarios 2 and 3 thus reflect the general assumption that a company with more (less) in foreign costs than in foreign revenue will be unfavorably (favorably) affected by a stronger foreign currency (Madura, 2006, p. 315). In the second scenario, the Profit Before Tax decreases from 576,000 EUR to 558,000 EUR when exchange rates depreciate. On the other hand, the overall Profit Before Tax increases in the case of appreciation of exchange rates,

from 576,000 EUR to 596,000 EUR.

The schematic effect of appreciation/depreciation of exchange rates is presented in Figure 5 by the slopes of the lines. The firm’s profit is most sensitive in the cases of Hungarian and Serbian currencies. The Romanian portfolio exposes a slight degree of sensitivity to exchange rate fluctuation, while profit translated from Croatian kuna, already reflect adequate composition of sales and purchases of energy.

Figure 5: The firm’s income statements sensitivity scenarios (denominated in 1000 EUR)



Source: The Firm, Income statements 2010 for the firm’s subsidiaries, 2011c.

The firm can reduce its economic exposure and sensitivity to currencies’ exchange rate fluctuations with restructuring activities, which involves shifting the sources of costs or revenue to other locations in order to match inflows and outflows in foreign currencies. The most sensitive currencies are Serbian dinar and Hungarian forint and it would be most reasonably to increase expenses for goods sold in either of the currencies and afterwards sell the goods in countries, where the euro is an official currency or to partners, which conclude the euro-denominated contracts. Therefore, the firm would be closer to matching inflows and outflows in Serbian dinar and Hungarian forint and this would lower firm’s sensitivity to exchange rate changes. On the other hand, the firm would increase its euro-denominated earnings from sales, which are not subjected to exchange rate changes.

If the firm decides and carries out the proposed restructuring activities, the firm’s sensitivity to exchange rate changes will fall accordingly. For example, the firm purchases for 10,000,000 RSD more energy in Serbia and for 40,000,000 HUF in Hungary. The bought energy is then sold to partners in neighbouring countries or still in Serbia/Hungary, but in the euro-denominated contracts, as shown in Table 12. After restructuring, the firm has 107,000 EUR of Profit Before Tax in case of Serbian dinar and 150,000 EUR in case of Hungarian forint, which do not change due to exchange rate, since the euro is the principal currency of

the firm and is not subjected to conversion activities.

Before restructuring the Profit Before Tax in case of Serbian portfolio was 143,000 EUR, 137,000 EUR and 149,000 EUR for first, second and third scenario, respectively. The values of RSD scenarios' Profit before tax deviate around ± 4.1 % from actual market value due to exchange rate changes. In Table 12, 100,000 EUR of Operating Profit in each scenario would, after successful restructuring, come from the euro-denominated anticipated earnings and would not be subjected to exchange rate fluctuations.

The euro-value of dinar-denominated net Operating Profit from the firm's trading activities is sensitive to currency fluctuations and would change from 18,000 to 23,000 EUR, based on scenario's exchange rates. The summed scenario's values of restructured Serbian portfolio are 144,000 EUR, 141,000 EUR and 147,000 EUR. The movement of Profit Before Tax can thus change just up to ± 2.1 % in either direction with regard to actual market value.

Table 12: The firm's income statements in RSD and HUF after restructuring (denominated in 1000 EUR)

| Income statement items | SCENARIO 1 - restructuring | | | SCENARIO 2 - restructuring | | | SCENARIO 3 - restructuring | | |
|------------------------|----------------------------|--------------|-------------------|----------------------------|--------------|-------------------|----------------------------|--------------|-------------------|
| | EUR | RSD (in EUR) | Together (in EUR) | EUR | RSD (in EUR) | Together (in EUR) | EUR | RSD (in EUR) | Together (in EUR) |
| Operating Profit | 100 | 20 | 120 | 100 | 18 | 118 | 100 | 23 | 123 |
| Profit from Financing | 7 | 17 | 24 | 7 | 16 | 23 | 7 | 17 | 24 |
| Profit Before Tax | 107 | 37 | 144 | 107 | 34 | 141 | 107 | 40 | 147 |

| Income statement items | SCENARIO 1 - restructuring | | | SCENARIO 2 - restructuring | | | SCENARIO 3 - restructuring | | |
|------------------------|----------------------------|--------------|-------------------|----------------------------|--------------|-------------------|----------------------------|--------------|-------------------|
| | EUR | HUF (in EUR) | Together (in EUR) | EUR | HUF (in EUR) | Together (in EUR) | EUR | HUF (in EUR) | Together (in EUR) |
| Operating Profit | 140 | 82 | 222 | 140 | 78 | 218 | 140 | 86 | 226 |
| Profit from Financing | 10 | 17 | 27 | 10 | 16 | 26 | 10 | 18 | 27 |
| Profit Before Tax | 150 | 99 | 248 | 150 | 94 | 244 | 150 | 103 | 253 |

Source: The Firm, Income statements 2010 for the firm's subsidiaries, 2011c.

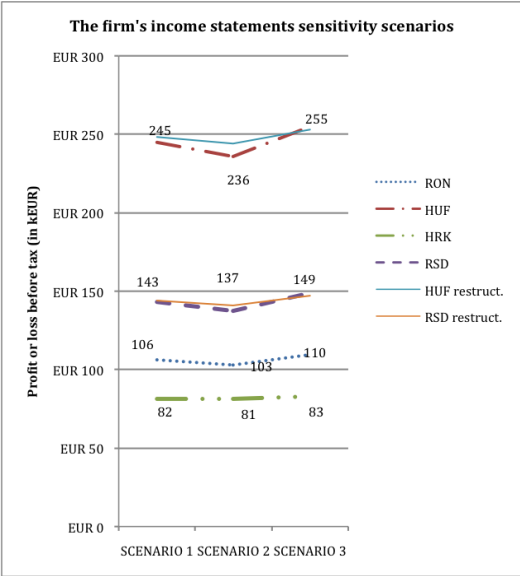
In the case of Hungarian currency the anticipated Profit Before Tax for first quarter of 2012 varies from 236,000 EUR to 255,000 EUR (see Table 10) due to possible forecasted exchange rate movements, what is approximately ± 4 % around actual market value as of 22nd September 2011. If the firm decides and carries out the restructuring activities, 150.000 EUR, the Profit Before Tax from the euro-denominated sales in Hungary or in neighbouring

countries (see Table 12, the column EUR in each restructuring scenario), would not be subjected to exchange rate changes.

The euro-denominated sales are a consequence of the firm’s anticipated additional buying of energy in Hungary (for 40,000,000 HUF) in order to match inflows and outflows in Hungarian forint and thus lowering its exposure due to exchange rate change. The remaining net value of Hungarian Operating Profit, which would be subjected to exchange rate changes, would vary from 78,000 EUR to 86,000 EUR. The summed scenario’s values of the restructured Hungarian portfolio are 248,000 EUR, 244,000 EUR and 253,000 EUR. The movement of Profit before tax can thus change just up to $\pm 2.0\%$ in either direction with regard to actual market value.

As we can see from the Table 12 and Figure 6, the sensitivity scenarios after restructuring show lesser distortion. The oscillations of Serbian portfolio could be lowered from $\pm 4.1\%$ to just $\pm 2.1\%$ around market value, while exposure of Hungarian portfolio could drop from around $\pm 4\%$ to just $\pm 2\%$, if mentioned restructuring is carried out properly.

Figure 6: The firm’s income statements sensitivity scenarios after restructuring (denominated in 1,000 EUR)



Source: The Firm, Income statements 2010 for the firm’s subsidiaries, 2011c.

The upper simulation could be first insight into assessment of economic exposure and it confirms general findings regarding economic sensitivity of a company’s future cash flows. The general conclusion, already mentioned, is that the firm with more foreign costs than foreign revenue will be unfavorably affected by a stronger foreign currency. Otherwise the restructuring activities are result of deliberate and longer-time planning, since there is no turning back. That is why the restructuring activities should be carried out with high degree of caution.

3.4.3 Translation exposure

As explained in one of the previous chapters, the translation exposure is “virtual” and thus does not affect cash flows directly. However, it does affect overall MNEs valuation. Therefore, a company is subjected to translation exposure when preparing periodical consolidated statements, especially when possible weakness of foreign currency occurs. Degree of translation exposure differentiates between companies and depends on the following:

- the proportion of its business conducted by foreign subsidiaries,
- the locations of its foreign subsidiaries,
- the accounting methods that it uses.

The firm is therefore to some degree exposed due to translation activities. The consolidated reports are prepared and converted into the firm’s functional currency. The consolidated financial statements on the parent company and its subsidiaries are prepared in accordance with the International Financial Reporting Standards (IFRS) as adopted by the EU (The Firm, 2010).

The translation exposure is probably the least important but it also needs a time for consideration. The actual consequences regarding translation activities occur when the profit is remitted from the subsidiaries to principal company. In the case of remittance, the money must be converted to the principal currency. The possible hedging techniques were already explained in one of previous chapters, together with all possible limitations. In the case of using standard hedging techniques there is a possibility to cause additional transaction exposure of the firm’s portfolio, which is not connected to core activities of the company. Perhaps one of the possible solutions for protection against translation exposure is fund adjustment, already presented in the master thesis. Yet another solution would be in the case when subsidiary would already know the amount of profit for the reporting period that would be remitted to the parent company. In this case, the company could use an option and hedge the already known remitted profit. The option would be far better solution than, for example, forward contract since it can benefit also from favorable exchange rate movements and profiting from the non-execution of option would offset the amount of the option premium.

Among accounting policies, the firm is following rules of a translation policy for foreign currency transactions and foreign operations. Foreign currency transactions are converted into the functional currency of the firm using the exchange rate applied on the day they arise. Cash, cash equivalents and liabilities denominated in foreign currencies are converted into the functional currency using the exchange rate applicable at the end of the reporting period. Positive or negative exchange differences are differences between the amortized cost in the functional currency at the beginning of the period, increased or decreased by the amount of effective interest and payments within the period, and the amortized cost expressed in foreign currency, converted using the exchange rate at the end of the period. Non-monetary assets and liabilities denominated in foreign currencies and measured at fair value are converted into the

functional currency at the exchange rate applicable on the day their fair value was determined. Exchange rate differences are recognized in the income statement. On the other hand, assets and liabilities of foreign companies are converted into the euro using the exchange rate applicable at the end of the reporting period. Revenues and expenses of foreign companies, with the exception of hyperinflationary economies, are converted into the euro at average exchange rates (The Firm, 2010).

Any resulting exchange rate differences are recognized directly in equity. As of 1 January 2005, these differences have been recognized in the foreign currency translation reserve (FCTR). When a foreign company is disposed of (in part or in full), the relevant amount in the FCTR is recognized in other comprehensive incomes (The Firm, 2010).

3.5 The firm's FX exposure management policy

The firm already in the first sentences of its annual reports, as part of its mission and vision, exposes importance of effective risk management for long-term success of a company. The key risks in energy trading, as recognized by the firm and already mentioned, are credit risks, market risks, liquidity risks and operational risks (The Firm, 2011d).

The firm defines the currency or FX risk as market risk, along with price and interest-rate risks, quantity and quantity-liquidity risk. These risks are associated with changes in the market conditions and are managed by using a comprehensive system for constant monitoring and analyzing of open positions. Open positions are most exposed to risks, i.e. the quantities and values defined as the difference between the aggregate quantity of purchases and the aggregate quantity of sales in a given period. This is why the effective management of such risks requires regular closing of open positions, which is achieved through ordinary physical trading and inclusion of financial trading tools (The Firm, 2010).

Currency or FX risks arise in connection with international transactions and are defined as the risks of loss resulting from the difference between the assumed and actual foreign exchange rates in the case where a company has a long position or short position on a net basis with regard to its assets and liabilities denominated in foreign (different) currencies (The Firm, 2011d).

In general, the firm effectively manages various business risks based on thorough and ongoing analyses, use of hedge instruments, and consistent application of rules and guidelines. The activities towards reduction of various risk exposures are centrally coordinated and linked to the daily monitoring of market changes (The Firm, 2010).

To hedge against currency risk, resulting from energy deals, the firm mostly uses a forward currency contracts, especially the non-standardized forward contracts. The firm is intensely hedging its open positions in Hungary and Romania by using outright forwards. The fragment review in Table 13 shows the firm's actual gains or losses from concluded energy deals in

Hungary and from hedging activities for month September 2010. The Total Effect of -14,628 EUR is the actual loss from outright forwards and is recorded in income statements for business year 2010.

In case the firm had not decided to hedge its deals in Hungary it would have incurred a profit of 18,115 EUR. The profit is result of favorable movement of exchange rate between issue date and payment date of the concluded energy deals. Altogether, the firm realized profit in the amount of 3,488 EUR.

Table 13: Fragmented review of the firm's P&L from outright forwards and real energy deals for Hungarian currency

| Month | Volume [MWh] | Value [HUF] | Exchange Rate at Trade Date – forward rate | Value at Trade Date [EUR] | Exchange Rate at payment date | Total Value at payment date [EUR] | Total Effect |
|------------------------------|--------------|-------------|--|---------------------------|-------------------------------|-----------------------------------|------------------|
| TOTAL SEPT10 - HEDGE | 40,640 | 544,218,000 | 281.24 | 1,935,066 | 279.13 | 1,949,694 | -14,628 € |
| TOTAL SEPT10 - ENERGY | | 673,985,083 | 281.24 | 2,396,477 | 279.13 | 2,414,592 | 18,115 € |
| | | | | | | Together: | 3,488 € |

Source: The Firm, Internal review of outright forwards for Hungarian forint, 2011e.

The usage of outright forward in this case was not necessary due to favorable movement of exchange rate, but Table 13 reports only a small segment of the overall hedging strategy that the firm pursues. In this case the movement of exchange rate was favorable from the firm's view, but is not always and this is the reason the firm adopted a hedging strategy, which focuses on overall hedging of all deals concluded in Hungarian forint.

Beside outright forwards the firm minimizes the FX risk also by currency clauses and by linking selling prices of goods to the currency used by the sources that finance the purchase of these goods. To a certain extent, FX risks between subsidiaries are reduced “naturally” because a part of the expected inflows from individual companies is balanced out by the expected outflows in the same currency.

Beside energy, the firm is also exposed in the case of obtained yearly CBTCs in Croatia, Macedonia, Serbia, Hungary and Romania, as already noted in subchapter 3.2.2. Such exposure arises due to existence of longer periods between conduct of auction and payment date and currency volatility reasons accordingly. However, the firm does not hedge against such FX risk.

To conclude, the firm is fairly young and thus actively involved in establishing a suitable infrastructure for foreign currency transactions and implementation of currency-hedging

mechanisms. Therefore, the next subchapter will provide a presentation, comparison and assessment of different and additional hedging techniques on the firm's exposed positions.

3.6 Assessments and recommendations for additional hedging activities

For the purpose of hedging transaction exposure, the firm uses some external hedging techniques, such as outright forwards, and some internal hedging techniques, such as currency clauses. Beside the mentioned and used techniques, there exist some other hedging instruments, whose relevance will be presented and assessed next, on the firm's net positions, as reported in Table 6.

The comparison will take into account four alternatives of hedging-versus-no-hedging activities. Among hedging techniques I choose a forward hedge, which is already in use by the firm, a money market hedge and a euro call option. These three hedging instruments will be compared to the alternative of no hedging at all.

The firm has net inflow in all four relevant currencies for third quarter of 2011. Usage of forward hedge means that the firm would sell its foreign-currency receivables 90 days forward. The exchange rate is known already at trade date of forward hedge and it does not change and thus the firm knows its exact value of receivables in advance. The forward rates for foreign currencies, except for Serbian dinar, which are stated in Table 14, were gathered from one of the firm's operating banks. Since forward rate for Serbian dinar is not quoted by any bank, it is calculated based on spot exchange rate of RSD/EUR as of 30th of June using the discount. The forward discount was derived from the annualized interest rate differential between Euro Area and Serbia, taking into account the number of days to delivery (90 days). The euro-value of receivables as at the end of third quarter 2011 is reported in Table 14, for each foreign currency separately.

Table 14: Forward hedge

| Currency | Net inflow — receivables | Forward exchange rate | Euro received in 90 days |
|------------------------|--------------------------------|--------------------------|-----------------------------|
| Croatian kuna (HRK) | 22,995 | 7.4337 | 3,093 € |
| Serbian dinar (RSD) | 1,216,154 | 101.70 | 11,958 € |
| Hungarian forint (HUF) | 9,090,643 | 270.50 | 33,607 € |
| Romanian leu (RON) | 8,655,092 | 4.2516 | 2,035,726 € |

Source: The Firm, Internal review on banking's data, 2011f, own calculation.

The firm expects receivables in foreign currencies and by using a money market hedge it could hedge its position by borrowing the currency now and converting it to needed currency, which is the euro. The receivables in foreign currencies will be used to pay off the loan. The 90-days borrowing and deposit interest rates are reported in Table 15 and were gathered from the offers of the firm's operating banks in foreign countries. The euro-value of the borrowed money after the 90-days deposit is reported in Table 15.

Table 15: Money market hedge

| Currency | Net inflow | Loan interest rate for 90 days. | Net inflow - to be borrowed | Euro value at the end of June | Deposit interest rate for 90 days. | Euro received in 90 days. |
|----------|------------|---------------------------------|-----------------------------|-------------------------------|------------------------------------|---------------------------|
| HRK | 22,995 | 6.75 % | 21,541 | 2,920 € | 3.15 % | 3,012 € |
| RSD | 1,216,154 | 10.69 % | 1,098,727 | 11,097 € | 6.94 % | 11,867 € |
| HUF | 9,090,643 | 6.08 % | 8,569,611 | 32,269 € | 2.00 % | 32,914 € |
| RON | 8,655,092 | 7.69 % | 8,037,230 | 1,957,435 € | 1.69 % | 1,990,467 € |

Source: The Firm, Internal review on banking's data, 2011f, own calculation.

Tables 16 reports on a euro call options as quoted by one of the firm's operating banks. Options for Serbian dinar are not quoted by any bank. The firm decides on the exercise price for the euro call option, while the bank calculates the corresponding premium, which is paid the option is exercised or not. Each euro-value of option in below tables is calculated based on the final price of the option plus the premium.

Table 16: The Euro Call option

| Currency | Foreign currency amount | Forecasted spot rate | Exercise price | Exercise option | Final price | Premium in EUR | Total (EUR) |
|----------------------------|-------------------------|----------------------|----------------|-----------------|-------------|----------------|-------------|
| EUR/HRK | 22,995 | 7.32 | 7.38 | No | 7.32 | 41 € | 3,101 € |
| EUR/HRK | 22,995 | 7.38 | 7.38 | Yes/No | 7.38 | 41 € | 3,074 € |
| EUR/HRK | 22,995 | 7.44 | 7.38 | Yes | 7.38 | 41 € | 3,074 € |
| EUR/HRK – actual spot rate | 22,995 | 7.49 | 7.38 | Yes | 7.38 | 41 € | 3,074 € |

| Currency | Foreign currency amount | Forecasted spot rate | Exercise price | Exercise option | Final price | Premium in EUR | Total (EUR) |
|----------------------------|-------------------------|----------------------|----------------|-----------------|-------------|----------------|-------------|
| EUR/HUF | 9,090,643 | 255.4 | 268 | No | 255.41 | 994 € | 34,599 € |
| EUR/HUF | 9,090,643 | 265.6 | 268 | No | 265.57 | 994 € | 33,237 € |
| EUR/HUF | 9,090,643 | 275.7 | 268 | Yes | 268.00 | 994 € | 32,926 € |
| EUR/HUF - actual spot rate | 9,090,643 | 293.6 | 268 | Yes | 268.00 | 994 € | 32,926 € |

| Currency | Foreign currency amount | Forecasted spot rate | Exercise price | Exercise option | Final price | Premium in EUR | Total (EUR) |
|----------------------------|-------------------------|----------------------|----------------|-----------------|-------------|----------------|-------------|
| EUR/RON | 8,655,092 | 4.00 | 4.23 | No | 4.00 | 41,127 € | 2,121,643 € |
| EUR/RON | 8,655,092 | 4.11 | 4.23 | No | 4.11 | 41,127 € | 2,066,786 € |
| EUR/RON | 8,655,092 | 4.21 | 4.23 | Yes | 4.23 | 41,127 € | 2,004,994 € |
| EUR/RON - actual spot rate | 8,655,092 | 4.30 | 4.23 | Yes | 4.23 | 41,127 € | 2,004,994 € |

Source: The Firm, Internal review on banking's data, 2011f, own calculation.

The possible (forecasted) spot rates are derived from spot rates from the end of June 2011 and by two quarter moving averages' standard deviations away in either direction. The quarterly

moving average' standard deviations for each currency were calculated for economic exposure and are presented in Table 9. Beside assessment of an euro-value of receivables on possible spot rate in 90 days, the Table 16 also reports on euro-value of receivables as it was at the end of September and in case on non-execution of the option. This serves for comparison of results if the firm decides for an option and does/does not execute one. The final price could be option's exercise price or spot rate on execution date.

The no-hedge alternative is presented in Table 17 and the euro-value of receivables is calculated on actual spot rates as of 22nd of September 2011.

Table 17: No hedge alternative

| Currency | Net inflow | Spot rate as of 22nd of Sep | Euro value of no hedge |
|----------|------------|-----------------------------|------------------------|
| HRK | 22,995 | 7.49 | 3,072 € |
| RSD | 1,216,154 | 101.36 | 11,998 € |
| HUF | 9,090,643 | 293.60 | 30,963 € |
| RON | 8,655,092 | 4.30 | 2,014,710 € |

Source: The Firm, Internal review on banking's data, 2011f, own calculation.

Table 18 reports regarding most profitable hedging technique of expected receivables at the end of third quarter of 2011. The foreign currency net inflows are calculated into euro-denominated receivables, which are expected at the end of September 2011 as the consequence of using different hedging methods.

Table 18: Comparison of hedging techniques – Euro-value of foreign currency-denominated receivables

| HEDGING ALTERNATIVES | Croatian kuna (in EUR) | Serbian dinar (in EUR) | Hungarian forint (in EUR) | Romanian leu (in EUR) |
|------------------------------|-------------------------------|-------------------------------|----------------------------------|------------------------------|
| FORWARD HEDGE | 3,093 € | 11,958 € | 33,607 € | 2,035,726 € |
| MONEY MARKET HEDGE | 3,012 € | 11,867 € | 32,914 € | 1,990,467 € |
| PUT OPTION - exercise | 3,074 € | no bank quote RSD option | 32,926 € | 2,004,994 € |
| NO HEDGE | 3,072 € | 11,998 € | 30,963 € | 2,014,710 € |

Source: The Firm, Internal review on banking's data, 2011f, own calculation.

The blue colored cells in the Table 18 highlight the most profitable among hedging alternatives. In case of Croatian Kuna the highest expected euro-value of foreign receivables express forward hedge (3,093 EUR) with the exercised euro call option (3,074 EUR) and no hedge alternative (3,072 EUR) being slightly behind. The similar situation arises in case of Hungarian receivables, expressing the highest euro-value in case of forward rate (33,607 EUR) and the exercised euro call option (32,926 EUR). The forward hedge (2,035,726 EUR) dominates also in Romanian case, followed by no hedge alternative (2,014,710 EUR) and exercised euro call option (2,004,094 EUR). There is limited choice for hedging of Serbian receivables, since no bank is interested in quoting the euro call option premium as well as

forward rate, which was not quoted but calculated from spot exchange rate using the discount. Otherwise situation for dinar is similar to Romanian situation with no hedge alternative (11,998 EUR) and forward hedge (11,958 EUR) being best hedging solutions.

The last hedging technique, the money market hedge, is expressing the lowest estimates of the future euro-denominated receivables and is thus considered as least profitable among hedging techniques. This results prove that money market hedge is essentially an operating tool of banking system and thus less suitable from the company's perspective.

To conclude, among hedging alternatives the forward hedge shows the best results, especially for portfolios with lower amounts in foreign currencies, and the euro call option is not lagging so much behind. The option is the most suitable when a company is dealing with higher amounts in foreign currencies, which is here the case of Romanian currency, and in case of quantity risk, which arises when a company cannot predict the exact amount of needed foreign currency' payables/receivables.

As already concluded in previous chapters, the firm is also exposed in the case of obtained yearly CBTCs and currently does not hedge against the corresponding FX risk. The latter arise since those capacities are awarded on yearly auctions before the year starts and paid on a monthly level with specified exchange rate on due date. The exchange rate can change significantly within a year, which can be seen from Table 2 where volatility calculations are made for four currencies to which the firm is most exposed. Therefore, it would be appropriate for the firm to reconsider hedging CBTCs obtained on yearly level in Croatia, Romania, Serbia, Macedonia and Hungary. On the other hand, the hedging activity is appropriate especially in the case of large net positions. In the case of CBTCs, the firm mostly concludes purchases and therefore imposes itself future liabilities, but the largest share of gained CBTCs is on monthly level. Therefore, the obtained yearly CBTCs present smaller proportion in the firm's future liabilities. Despite this fact, the firm should every year reconsider hedging yearly CBTCs, especially when higher proportion of liabilities is incurred at the yearly level.

CONCLUSION

Master thesis provides insight into one of more important factors when conducting trade internationally, which is the exchange rate. Trading across borders involves usage of different currencies and exchange rate is a basic benchmark when evaluating trading goods, assets or services in different countries.

Due to different exchange rates, which express different purchasing power of currencies, MNEs can be exposed to fluctuations of FX rates. Companies that engage in trading outside home countries are subjected to FX risk. The master thesis assessed exposure of *the firm*, which is an electricity trading company, to currency fluctuations and corresponding FX risk.

The findings can be summed as follows:

- The firm has transaction exposure due to conduct of energy and CBTCs trades in foreign currencies.
- The firm is exposed to energy transaction in Romania, Hungary and Serbia when currency clauses are not used.
- The firm is exposed when having obtained yearly CBTCs in Croatia, Macedonia, Romania, Hungary and Serbia, but just in case when yearly CBTCs present larger proportion of all types of CBTCs.
- The firm is exposed from the economic perspective of FX risk, since having anticipated higher net positions in foreign currencies.
- The firm is moderately exposed from translation view of FX risk, since it conducts some business with its foreign subsidiaries, which is subsequently translated into company's principal currency (the euro) and remitted to parent company.

Transaction, translation and economic exposure are three different aspects of FX risk and the evaluation of mentioned exposures is basis for the company's setting of strategies in order to hedge against FX risk. Master thesis evaluated the firm's exposures and presented used techniques for hedging. A company is currently using outright forwards for hedging transaction exposure in Romania and Hungary and currency clauses when trading in Serbia.

The firm's economic exposure expresses some FX risk since subsidiaries' anticipated income statements have quite high net position in foreign currency for the first quarter of 2012, which can be affected by exchange rate changes. The master thesis presented possible scenarios in the case of FX positions in Serbia, Croatia, Romania and Hungary and offers restructuring activities. The latter ones consist of increasing Costs of Goods Sold in Serbian dinar and Hungarian forint and increasing the euro-denominated revenue, which is not sensitive to exchange rate changes. The firm is therefore buying more energy in foreign currency and at the same time selling this energy to partners in the euro-denominated arrangements. Measurement of this exposure has shown as the hardest one where constant reviewing of positions and exchange rates is necessary.

Translation exposure is subjected to FX risk when subsidiaries carry out remittances to their parent company. The firm does not hedge against economic and translation exposure. Nevertheless, the firm has an internal risk management policy, but despite of mentioned internal guideline, the firm does not hedge against all exposure. Currently is undertaking actions just in order to eliminate transaction exposure in Romania and Hungary. Therefore, the firm is highly risk-averse when it comes to actual transactions in foreign currencies, but has low risk aversion regarding economic and translation exposure.

Regarding to above conclusions I can fully confirm the third hypothesis, while first and second one can be confirmed just partly:

- The international trading activity can cause certain degree of exposure due to FX risk, which is most easily reduced or eliminated by natural hedging.

Participation on several markets can lead to numerous and various risks. A company that concludes trading deals in foreign currencies is exposed to FX risk, since it will have to convert the receivables to parent currency or pay the liabilities in a foreign currency. Natural hedging is the best solution, since it matches the inflows and outflows in the same currency, but sometimes the companies cannot pursue this strategy. Therefore financial institutions offer variety of derivative financial instruments, which protect companies from adverse effect of exchange rates' movement and are the best replacement of no-hedge strategy as well as the strategy of natural hedging.

- The firm due to its youngness and predominant focus on growth and development in its core business does detect transaction exposure but does not hedge it perfectly.

The firm is aware of its transaction exposure to FX risk despite its youngness and development orientation what is reflected through perfect hedging of deals conducted in the Hungarian forints and in Romanian leu with the usage of forward contracts. Beside usage of external hedging methods in cases of open positions in forint and leu, the firm uses internal method (currency clause) in case of positions in Serbian dinar. Nevertheless, master thesis also proved that there exist limited possibilities for external hedging of Serbian dinar. On the other hand, the firm does not hedge any position in Croatian Kuna. This can be explained with Kuna's very low volatility, which, along with the firm's low-netted positions in the currency, can generate only lower degree of transaction exposure. Yet another reason for the firm's decision on hedging activity could be dealing with currencies (RSD, HRK, HUF, etc.), which are known to be minor currencies within the FX world and thus the firm has also limited possibilities for hedging.

- The firm's current organizational environment for management of exposures to FX risk is not yet prepared for assessment and management of economic and translation exposure.

The firm has the potential for possible improvements towards establishment of risk management department and daily monitoring and managing of the currency risk exposure.

Regarding to assessed activities of the firm I would also recommend hedging of obtained yearly CBTCs, reconsider using options in case of larger amounts of liabilities/payables in foreign currency, more consideration regarding management of economic exposure using restructuring activities and hedging possible subsidiaries' remittances to the parent company.

POVZETEK

Mednarodno poslovanje prinaša tako prednosti kot tudi nepričakovane in včasih neugodne izide poslovnih odločitev in dejanj. Multinacionalna podjetja se v mednarodnem trgovanju srečujejo tako s koristmi (kot sta možnost konstantne rasti podjetja in povečanja dobička) in tudi z različnimi ovirami in so velikokrat izpostavljeni različnim tveganjem. Mednarodna trgovina predstavlja menjavo blaga in storitev ter vključuje obvladovanje tveganj, ki variirajo od političnih in gospodarskih do ekonomskih in finančnih. Vsa omenjena tveganja nastajajo na ravni posamezne države in magistrsko delo se bo osredotočilo na valutno tveganje, ki izhaja iz nihanj deviznih tečajev. Devizne tečaje je težko natančno napovedati, zato je z vidika multinacionalnega podjetja pomembno, da meri in ocenjuje izpostavljenost tečajnim nihanjem. Merjenje izpostavljenosti je pomembno za nadaljnje ukrepe s področja upravljanja s tveganji in zmanjšanja izpostavljenosti. Potrebno se je zavedati, da je vsako podjetje na mednarodnem trgu izpostavljeno valutnemu tveganju in celo podjetja, ki so prisotna izključno na domačem trgu, so do neke mere izpostavljene nihanju domače valute zaradi dogajanj na mednarodni ravni. Magistrsko delo analizira transakcijsko, ekonomsko in prevedbeno izpostavljenost valutnemu tveganju v podjetju, ki trguje na trgu z električno energijo. Pomemben organizacijski vidik vsakega multinacionalnega podjetja je vzpostavitev in izvrševanje ustrezne politike upravljanja s tveganji. Zato magistrska naloga oceni in predstavi metode ščitenja pred valutnim tveganjem v analiziranem podjetju in poskusi priporočiti nadaljnje tehnike za uspešno obvladovanje izpostavljenosti valutnemu tveganju.

Magistrska naloga je sestavljena iz treh vsebinskih poglavij, sklepa in povzetka magistrskega dela v slovenskem jeziku. V nadaljevanju bom povzela vsa vsebinska poglavja v zvezi z zavarovanjem pred tečajnim tveganjem v podjetju, ki posluje na področju trgovanja z električno energijo.

Prvo poglavje predstavi osnovno terminologijo v zvezi z deviznimi tečaji, način določanja deviznih tečajev, teorije paritetnih pogojev, različne devizne sisteme in transakcije deviznega trga.

Terminologija razloži način predstavitve deviznega tečaja na deviznem trgu, kjer obstajajo direktne in indirektne kotacije ter promptni in terminski tečaji. Devizni tečaj se navaja direktno, kadar želimo dobiti podatek o številu enot domače valute, ki jo potrebujemo za nakup/prodajo ene enote tuje valute. Indirektna kotacija je ravno obratna in izraža vrednost enote domačega denarja, izraženega s številom enot tujega denarja. Promptni tečaj se uporablja za trenutne devizne transakcije oziroma transakcije, ki bodo izvedene v roku dveh dni. Terminski devizni tečaj je uporabljen za devizno transakcijo, ki se bo realizirala po več kot dveh dneh. V praksi se najbolj uporabljajo eno-, tri-, šest-, devet- in dvanajstmesečni terminski devizni tečaji.

Prodaja oziroma nakup valut poteka na deviznem trgu, ki deluje na osnovi povpraševanja in ponudbe. Na točki, kjer se povpraševanje in ponudba srečata, se oblikuje ravnotežni menjalni tečaj in izvrši menjava. Naraščajoča krivulja ponudbe (npr. funt/evro) pomeni, da v primeru naraščajočega menjalnega tečaja narašča število enot funta, ki ga lahko kupimo za en evro. To

pomeni, da postajajo dobrine evroobmočja relativno cenejše od angleških in posledično se bo povečala ponudba angleškega funta na deviznem trgu. Padajoča krivulja povpraševanja pa pomeni, da vrednost angleškega funta pada, zaradi česar bodo v evroobmočju kupovali več tujih dobrin in povpraševanje po angleškem funtu se bo povečalo. Naklona krivulje povpraševanja in ponudbe vplivata tudi na uvoz in izvoz. Kadar neka valuta aprecira (ko postane vredna več), se poveča uvoz v državo te valute in zmanjša izvoz. Kadar valuta deprecira (ko postane vredna manj v primerjavi z drugo valuto), se poveča izvoz in zmanjša uvoz v dotično državo.

Menjalni tečaj torej vpliva na proizvodnjo, inflacijo, zunanjo trgovino in mnogo drugih osrednjih ekonomskih in gospodarskih ciljev vsake države. Devizni tečaj je posledično lahko določen preko tržnih sil ponudbe in povpraševanja, mnogokrat pa na višino in smer menjalnega tečaja poskušajo vplivati tudi države same. Zato je potrebno razlikovanje med termini apreciacija/depreciacija in prevrednotenje/razvrednotenje. Prvi sklop izrazov se nanaša na tržno določitev menjalnega tečaja, medtem ko drugi sklop obravnavamo v povezavi z ukrepi države, ki umetno zniža/zviša ceno svoje domače valute.

Pet temeljnih teorij paritetnih pogojev predstavlja osnovo in pomoč za analiziranje sprememb, do katerih prihaja pri deviznih tečajih. Pariteta kupnih moči, pariteta obrestnih mer, Fisherjev učinek, mednarodni Fisherjev učinek in terminski tečaj kot nepristranska napoved prihodnjega promptnega deviznega tečaja so teorije, ki medsebojno povezujejo ključne domače in tuje monetarne indikatorje – inflacijske stopnje, obrestne mere ter promptne in terminske devizne tečaje.

Poleg inflacije in obrestnih mer na spremembo deviznih tečajev vplivajo še naslednji faktorji, ki jih na kratko predstavi tudi magistrska naloga: dogajanje na tekočem računu države, pričakovanja in špekulacije glede kratko- in dolgoročnih kapitalskih gibanj ter strukturne spremembe.

Kot že omenjeno lahko na devizni tečaj s svojimi ukrepi vplivajo tudi države. Razlog za takšno ravnanje je v prepričanju držav, da je menjalni tečaj preveč pomemben ekonomski faktor, ki bi ga prepuščali nereguliranemu deviznemu trgu. Tako so se v toku zgodovine oblikovali in razpadli različni sistemi deviznih tečajev. Danes se najpogosteje pojavljata dva: prilagodljiv in fiksni sistem deviznega tečaja. Za prvi sistem so znani drseči ali "plavajoči" menjalni tečaji in velja da so popolnoma prilagodljivi ter se spreminjajo izključno pod vplivom ponudbe in povpraševanja. Drugi je sistem fiksnih deviznih tečajev, kjer vlada določi tečaj, po katerem se domača valuta preračunava v druge valute oziroma obstaja povezava domače valute z določeno tujo valuto ali košarico mednarodno pomembnejših valut. Slednje pomeni, da država drsenje svoje valute poveže z drsenjem tistih mednarodno pomembnih valut, na katere se je navezala. Najbolj znana sistema fiksnih deviznih tečajev sta bila sistem zlatega standarda (pred prvo svetovno vojno) in Brettonwoodski monetarni sistem (po drugi svetovni vojni). Poleg omenjenih osnovnih dveh sistemov obstajajo še vmesne različice, med katerimi magistrsko delo izpostavi klasifikacijo Mednarodnega denarnega sklada.

Devizni trg je sestavljen iz vseh geografskih lokacij po svetu in poteka s pomočjo telekomunikacijskega omrežja med finančnimi centri, kot so London, New York, Tokio in drugi. Devizni trgi so največji segment vseh finančnih trgov na svetu. Skupni obseg transakcij na teh trgih je aprila 1989 znašal 600 milijard \$ na dan, aprila leta 2004 1,9 bilijona \$ na dan, medtem ko je aprila 2010 celoten obseg dosegel 4,0 bilijone \$ na dan, kar je 20 % več, kot je znašal iznos aprila 2007.

Na deviznih trgih udeleženci izvajajo transakcije. Transakcije delimo na promptne in terminske transakcije, ki so namenjene izvajanju čezmejnega poslovanja. Poleg tega pa se devizne transakcije izvajajo tudi za namen zavarovanja pred valutnim tveganjem (terminske transakcije, valutne zamenjave, terminske pogodbe in opcije) oziroma za namene špekulacije.

Promptne transakcije so transakcije nakupa oziroma prodaje deviz, ki se izvedejo v dveh delovnih dneh. Pri terminskih transakcijah je cena devize dogovorjena na dan sklenitve posla, realizacija transakcije pa je od sklenitve posla odmaknjena več kot dva delovna dneva. Terminske transakcije se razlikujejo od promptnih transakcij, vendar obstaja povezava, ki izhaja iz okvira paritete obrestne mere. Slednja je odgovorna za odpravljanje tržne neučinkovitosti, ki bi ustvarila možnosti za arbitražo dobička. Terminski tečaj se mora razlikovati od promptnega tečaja, tako da ni možnosti za arbitražo. To je doseženo preko premije oziroma diskonta promptnega tečaja, ki odraža ravno razliko v obrestnih merah med dvema državama. V praksi so terminske premije oziroma diskonti izraženi kot letna stopnja odstopanja od promptnega deviznega tečaja. Valutna zamenjava pa na drugi strani predstavlja sočasen nakup in prodajo določene količine tuje valute na dveh segmentih deviznega trga z različnima dnevoma valutacije. Dejansko gre za sočasno izvedbo dveh transakcij, ki spadata v okvir ene pogodbe.

Ostale glavne devizne transakcije so standardizirana in nestandardizirana terminska pogodba ter opcija in se uvrščajo med finančne derivative. Standardizirana terminska pogodba (tudi "futures" pogodba) ima specificirano tako količino deviz kot tudi vse druge elemente transakcije (npr. način kotacije valute, zapadlost pogodbe, dan poravnave, itd.). Po drugi strani je nestandardizirana pogodba fleksibilna glede elementov transakcije in je narejena po individualnih potrebah klienta komercialne banke. Opcija pa je finančni instrument, ki kupcu daje pravico, ne pa tudi obveznost, da kupi oziroma proda standardizirano količino tuje valute, s katero se trguje, po fiksni ceni in na določen dan oziroma do določenega dne v prihodnosti.

Vsi trije derivativi so namenjeni bodisi zavarovanju pred neugodnimi spremembami deviznega tečaja bodisi špekuliranju, vendar pa samo opcija kupcu omogoča, da izkoristi možnost ustvarjanja dobička, do katere prihaja v primeru zanj ugodnih sprememb v deviznem tečaju. Edina slabost opcije je plačilo premije za nakup opcije ne glede na to, ali kupec opcijo izvrši ali ne. Najmanj fleksibilen instrument med derivativi je standardizirana terminska pogodba, saj že vnaprej določa tako količino deviz kot datum zapadlosti, ki sta pri

nestandardizirani pogodbi dogovorjena v okviru potreb klienta.

Drugo poglavje se ukvarja z načini merjenja izpostavljenosti in upravljanja tečajnega tveganja. Tečajno tveganje se nanaša na izpostavljenost tveganju zaradi nezaželenih in nepričakovanih nihanj deviznih tečajev. Takšnemu tveganju so izpostavljeni izvozniki, kadar pričakujejo plačilo v tuji valuti. Prav tako so mu izpostavljeni investitorji, ki vlagajo kapital v tujo državo in pričakujejo plačila ter imajo obveznosti v tuji valuti. Zaznajo ga lahko celo celotna podjetja, ki poslujejo izključno v svoji državi, in sicer v primeru apreciacije domače valute. V tem primeru tuja podjetja povečajo svoj izvoz v to državo in posledično upade povpraševanje po izdelkih domačega podjetja zaradi konkurence cenejših izdelkov tujih proizvajalcev.

Zaradi nihanja deviznega tečaja in posledično valutnega tveganja obstajajo tri vrste izpostavljenosti: transakcijska, ekonomska in prevedbena izpostavljenost valutnemu tveganju.

Transakcijska izpostavljenost je najpogostejša in obstaja vedno, kadar ima podjetje denarni tok nominiran v tuji valuti in s pogodbeno osnovo ter kadar se le-ta pričakuje v bližnji prihodnosti. Tveganje nastopi, kadar obstaja nevarnost spremembe deviznega tečaja med trenutnim datumom in datumom poravnave. Za izračun transakcijske izpostavljenosti mora podjetje oceniti netiran denarni tok v posamezni valuti in izračunati potencialni vpliv zaradi izpostavljenosti valute. Za zmanjšanje transakcijske izpostavljenosti ima podjetje na voljo zunanje in notranje instrumente zavarovanja oziroma ščitenja. Zunanji elementi zavarovanja so: standardizirane (t.i. "futures" pogodbe) in nestandardizirane (t.i. "forward") terminske pogodbe, opcije in opcijske strategije ter "money market hedge". Trije instrumenti ("futures", "forward" in opcije) so bili predstavljeni že v okviru transakcij na deviznem trgu. Poleg slednjih obstajata še dva dodatna instrumenta zaščite: opcijske strategije in t.i. "money market hedge". Opcijske strategije ("strangle", "straddle", "knock-in", "knock-out", valutna ovratnica) omogočajo medsebojno netiranje premij in tako postanejo še učinkovitejši način zaščite pred tveganjem, saj eliminirajo premijo, ki jo je potrebno plačati neglede na izvršitev opcije. "Money market hedge" je način zaščite z uporabo posojil in dolgov na denarnem trgu, s katerim se pokrije prihodnje obveznosti oziroma terjatve podjetja. Tehnike ščitenja omogočajo podjetju znižati potencialno izgubo zaradi izpostavljenosti večjim nihanjem deviznih tečajev.

Poleg zunanjih tehnik zavarovanja pred tečajnim tveganjem pa obstajajo še notranje oblike zaščite, kot so zakasnitev ali predčasno poplačilo terjatev oziroma obveznosti, valutna diverzifikacija ter "cross-hedging", "matching" in netiranje. Valutna diverzifikacija se nanaša na dejansko geografsko diverzifikacijo podjetja, ki posledično prinese tudi obveznosti oziroma terjatve v tujih valutah. "Cross-hedging" je uporaben, kadar izpostavljenosti do določene valute ne moremo ščititi zaradi nedostopnosti oziroma neobstoja instrumentov ščitenja za dotično valuto. Tako se podjetje odloča ščititi valuto, v kateri ima prav tako nominirane obveznosti oziroma terjatve in ob upoštevanju podatka, da imata ti dve valuti (valuta, ki se ne more ščititi in tista, s katero se ščiti to valuto) visoko stopnjo korelacije. Razlika med "matching-om" in netiranjem je v sodelovanju tretje strani. Pri netiranju podjetje

samo ali skupaj s svojimi podružnicami netira prilive in odlive v tujih valutah, medtem ko “matching” vključuje sodelovanje tujega podjetja in ne podružnic podjetja.

Ekonomska izpostavljenost je izpostavljenost prihodnjih denarnih tokov podjetja zaradi spremembe deviznih tečajev. Nanaša se na vpliv sprememb deviznih tečajev na prihodnjo prodajo podjetja, cene izdelkov, stroške surovin in vrednost tujih naložb podjetja. Od transakcijske izpostavljenosti se razlikuje po tem, da vsebuje učinek nihanj deviznih tečajev na dolgoročno dobičkonosnost podjetja, ki izhaja iz sprememb v prihodkih in odhodkih. Medtem ko se transakcijska izpostavljenost pojavlja samo kot učinek nihanj deviznih tečajev na tekočih pogodbenih transakcijah, ekonomska izpostavljenost vsebuje torej še transakcijsko izpostavljenost in je dolgoročno pomembnejša za poslovanje samega podjetja.

Metoda merjenja ekonomske izpostavljenosti podjetja je merjenje občutljivosti prihodkov in denarnih tokov glede na devizne tečaje. Pri tem mora podjetje napovedati spremembo vsake postavke izkaza poslovnega izida na podlagi različnih napovedi tečajev. Ker je ekonomsko izpostavljenost podjetij težko meriti, saj je odvisna od stopnje internacionalizacije v strukturi stroškov in prihodkov podjetja, obstaja zgolj nekaj načinov upravljanja le-te. Sem uvrščamo diverzifikacijo poslovanja in razpršenost financiranja. Diverzifikacija poslovanja je povezana s prestrukturiranjem in diverzificiranjem proizvodnih enot, s čimer se posledično izvede tudi valutna diverzifikacija, ampak je slednja zgolj dodatna korist v širjenju poslovanja. Razpršenost financiranja pa pomeni, da diverzifikacija dolgov zmanjša skupno izpostavljenost podjetja zaradi večjih sprememb obrestnih in inflacijskih mer v posameznih državah.

Prevedbena oziroma računovodska izpostavljenost meri učinek spremembe deviznih tečajev na konsolidirane poslovne izkaze podjetja in je zgolj “papirnata” oziroma “virtualna”. Nanaša se na trenutna merjenja preteklih dogodkov in velja, da naj bi bili računovodski dobički oziroma izgube zaradi prevoda nerealiziran-i/-e.

Politika in tehnike ščitenja v podjetju so močno odvisne od stopnje zavedanja izpostavljenosti valutnemu tveganju in stopnje občutljivosti do valutnega tveganja. Na podlagi zavedanja se podjetje tudi odloča o vrsti in višini ščitenja: zavarovanje delne izpostavljenosti, zavarovanje celotne izpostavljenosti, selektivno ščitenje odprte pozicije.

Tretje poglavje se ukvarja z aplikacijo teorije na realni primer podjetja. Zaradi razlogov, ki so zaupne narave, podjetje ostaja anonimno, vendar pa so uporabljeni podatki resnični. Podjetje, ki je prisotno na trgu električne energije v srednji in jugozahodni Evropi, je zelo mlado. Kljub mladosti je danes prisotno že na več 15 evropskih trgih in beleži stabilno rast v zadnjih petih letih. Podjetje ima v Sloveniji več organizacijskih enot in številne podružnice po Evropi. Njegove osnovne dejavnosti se delijo na odkup električne energije od kvalificiranih proizvajalcev, trgovanje z električno energijo ter prodajo električne energije končnim odjemalcem. V okviru samega poslovanja je pomembna tako energija kot tudi čezmejne prenosne zmogljivosti, ki so potrebne za prenos energije med državami.

Magistrska naloga se v okviru upravljanja s tveganji zaradi nihanj deviznih tečajev osredotoči na poslovanje organizacijske enote, ki se ukvarja s trgovanjem z električno energijo in na poslovanje podružnic podjetja. V okviru trgovanja, ki obsega nakup/prodajo električne energije in nakup/prodajo čezmejnih prenosnih zmogljivosti, je podjetje izpostavljeno predvsem zaradi nihanj naslednjih valut: srbskega dinarja, madžarskega forinta, romunskega rona in hrvaške kune. Magistrsko delo izračuna in predstavi vse tri izpostavljenosti podjetja valutnemu tveganju: transakcijsko, prevedbeno in ekonomsko ter oceni način zavarovanja podjetja pred takšnim tveganjem.

Z vidika transakcijske izpostavljenosti so za podjetje še posebej relevantni denarni tokovi v tujih valutah, ki so predvideni za naslednji mesec oziroma kvartal. Na podlagi kvartalnih podatkov za že kupljeno/prodano energijo za tretje tromesečje leta 2011 je ocenjena transakcijska izpostavljenost podjetja izračunana na podlagi pričakovanega deviznega tečaja dinarja, rona, kune in forinta na koncu tretjega kvartala 2011 ter ob 95 % stopnji zaupanja. Pričakovani devizni tečaji so ocenjeni na podlagi dnevnih procentualnih odstopanj deviznih tečajev v zadnjih petih letih. Vse štiri valute imajo za tretje tromesečje pričakovane netirane prilive in najvišjo izpostavljenost izraža romunski ron, ki lahko zaradi nihanja deviznega tečaja pričakuje izgubo (v primeru apreciacije rona v primerjavi z evrom) oziroma profit (v primeru depriacije rona v primerjavi z evrom) do višine 33.000 EUR. Izpostavljenosti ostalih valut so manjše, do maksimalno 1.000 EUR.

Netirane denarne tokove v tujih valutah lahko obravnavamo tudi kot portfelj valut. Izpostavljenost slednjega se izračuna na podlagi standardnega odklona portfelja, na katerega vplivata variabilnost posamezne valute in korelacija nihanj med valutami, ki sestavljajo portfelj. Magistrska naloga tako izračuna korelacije med valutami, ki so najpomembnejše z vidika podjetja (HUF, RON, RSD in HRK), na podlagi kovarianco med podatki vzorca in standardne odklone vzorca. Izračunane korelacije za HUF, RON, RSD in HRK so med 0.00 in 0.50, kar pomeni, da imajo valute pozitivno vendar nizko stopnjo korelacije. To pomeni, da se gibajo v isti smeri proti evru, vendar z nizko stopnjo nihanja.

Izračun korelacij je pomemben za oceno transakcijske izpostavljenosti, ki temelji na metodi VAR (Value-at-risk). Slednja določi maksimalno izgubo v vrednosti pozicij podjetja zaradi nihanj deviznih tečajev. Magistrska naloga je izračunala maksimalno četrtno izgubo podjetja zaradi prihodnjih denarnih odlivov v portfelju valut. Podjetje pričakuje netiran priliv za tretje četrtletje v višini 2,1 milijona EUR. V podjetju posli, sklenjeni v romunskih ronih, predstavljajo večino, 97,7 % vrednosti celotnega portfelja, medtem ko je odstotek drugih valut v skupnem portfelju zanemarljiv, do 2 %. Na podlagi korelacij, standardnega odklona 4-valutnega portfelja (3,93 %) ter 95 % stopnje zaupanja na osnovi normalne porazdelitve, maksimalna četrtna izguba podjetja znotraj valutnega portfelja znaša -6,49 %. Če bi izračunali maksimalno izgubo za posamezen valutni portfelj, bi za romunski portfelj znašala -6,58 %, za madžarskega -7,81 %, za srbskega -6,78 % in za hrvaškega -1,59 %, kar je skupaj višje kot znaša izguba v primeru 4-valutnega portfelja. Razlog za takšno razliko leži v

diverzifikacijskih učinkih in korelaciji med deviznimi tečaji valut. Namreč nižja je korelacija v gibanju deviznih tečajev štiri-valutnega portfelja, večji so diverzifikacijski učinki.

Magistrska naloga se v okviru ekonomske izpostavljenosti osredotoči na izračun občutljivosti prilivov/odlivov podjetja zaradi nihanj deviznih tečajev. Trije scenariji ponazorijo ekonomsko izpostavljenost podjetja zaradi pričakujočih prilivov/odlivov v prvem tromesečju leta 2012. Prvi scenarij oceni evrsko vrednost različnih postavk poslovnega izkaza na podlagi trenutnih deviznih tečajev (v septembru 2011 za prvi kvartal 2012), drugi scenarij v primeru deprecijacije in tretji scenarij v primeru apreciacije deviznih tečajev. Ekonomska izpostavljenost podjetja lahko na podlagi treh scenarijev deviznih tečajev glede na trenutne izkaze poslovanja za prvi kvartal variira od 558.000 EUR do 596.000 EUR. Podjetje ima predvidenih več prihodkov kot stroškov iz naslova energijskih pogodb za prvi kvartal 2012, in že splošna predpostavka pove, da bo močnejši devizni tečaj tujih valut (RON, HUF, RSD, HRK) imel pozitiven učinek na vrednost poslovnega izkaza. Zaradi izračunane izpostavljenosti magistrska naloga predlaga povečanje stroškov iz naslova nakupa energije in predvidi prodajo kupljene srbske in madžarske energije partnerjem, s katerimi podjetje sklepa pogodbe v evrih, ali prodajo energije v evroobmočje. S tem se povečajo stroški nakupa dobrine v tujih valutah, kar rezultira v manjšem netiranem znesku prihodkov in odhodkov v tuji valuti. Končni učinek je znižana ekonomska izpostavljenost podružnic podjetja in občutljivost prilivov/odlivov podjetja na nihanje deviznih tečajev. Posledično glede na tri scenarije ekonomska izpostavljenost podjetja variira le še med 569.000 EUR in 593.000 EUR.

Prevedbena izpostavljenost podjetja je, kot že omenjeno, zgolj na papirju. Sicer pa je odvisna od odstotka poslovanja, ki se izvrši preko podružnic, od lokacije podružnic podjetja in od uporabljenih računovodskih metod. Analizirano podjetje je do neke mere izpostavljeno tudi zaradi prevedbenih aktivnosti, vendar pa se tečajne razlike, ki nastanejo pri preračunu tujih valut v EUR, neposredno pripoznajo kot prevedbena rezerva.

Podjetje že v svojih letnih poročilih omenja, da je upravljanje s tveganji pomemben faktor z vidika dolgoročne uspešnosti podjetja. V svoji matriki tveganj uvršča valutno tveganje med dogodke, ki imajo do 20 % možnosti za nastanek in lahko povzročijo, v primeru pojava, poslovno škodo do višine 2.5 milijona EUR.

Podjetje izvaja poslovanje na naslednjih trgih: Nemčija, Avstrija, Republika Češka, Madžarska, Italija, Slovenija, Hrvaška, Bosna in Hercegovina, Črna Gora, Srbija, Makedonija, Albanija, Grčija, Bolgarija, Romunija in Kosovo. Euro, ki je valuta matičnega podjetja, je nacionalna valuta v Nemčiji, Avstriji, Italiji, Sloveniji in Grčiji. Prav tako se uporablja v Črni Gori, Albaniji in na Kosovu. Bolgarija in Bosna in Hercegovina imata svojo valuto vezano na euro s fiksnim deviznim tečajem: 1,95583 domače valute za en EUR. Podjetje ima zgolj nekaj poslovnih partnerjev na Hrvaškem in v Makedoniji in ti dve državi služita zgolj kot tranzitni državi. Posledično je podjetje izpostavljeno na nihanje deviznih tečajev predvsem zaradi kupljenih čezmejnih prenosnih zmogljivosti, ki jih je potrebno plačati

v domači valuti. Na Češkem je podjetje trenutno prisotno le na borzi PXE, kjer trguje s finančnimi derivativi in so vse transakcije izvedene v EUR.

Podjetje trenutno v celoti ščiti energijske posle, ki so sklenjeni v madžarskih forintih in romunskih ronih. Za zavarovanje uporablja nestandardizirane terminske pogodbe. Uporaba letih se podjetju izplača, saj bi v primeru neščitenja lahko utrpelo poslovno škodo zaradi sprememb deviznih tečajev. Podjetje kot način zavarovanja v Srbiji uporablja valutne klavzule, ki so dodane znotraj pogodb z nekaterimi partnerji. Z njimi podjetje fiksira vrednost posla v evrih, ki je sicer izveden v srbski valuti. Podjetje trenutno še ne uporablja tehnik zavarovanja pred valutnim tveganjem v primeru nakupa čezmejnih prenosnih zmogljivosti. Prav tako ne ščiti prenosa dobička s podružnic na matično družbo, ki sodi v okvir prevedbene izpostavljenosti.

Magistrsko delo se zaključi s sklepom, ki je le povzetek vseh ključnih ugotovitev in nabor predlogov za dodatno zavarovanje podjetja pred valutnim tveganjem. V celoti je bil potrjena tretja hipoteza, medtem ko sta ostali dve potrjeni le delno:

- Mednarodna trgovina lahko povzroči določeno stopnjo izpostavljenosti valutnemu tveganju, ki pa je najlažje zmanjšana oziroma odpravljena z uporabo naravnega ščitenja.

Poslovanje podjetja na več različnih trgih pomeni tudi soočanje s številnimi in različnimi tveganji. Podjetje, ki sodeluje na deviznem trgu je podvrženo valutnemu tveganju oziroma tveganju zaradi nihanj deviznih tečajev. Naravni hedging je verjetno najboljša rešitev, saj izenačuje prilive in odlive v isti valuti in posledično zmanjšuje odprto pozicijo, vendar pa velikokrat podjetje ne more izvajati takšne strategije. Zato finančne institucije ponujajo številne finančne derivative, s katerimi se podjetje lahko zaščiti pred negativnimi vplivi nihanj deviznih tečajev. Takšni instrumenti so najboljša nadomestilo no-hedge strategije, kot tudi strategije naravnega hedging-a.

- Podjetje kljub svoji mladosti in poslovni usmeritvi v rast in razvoj sicer zaznava transakcijsko izpostavljenost, vendar jo ne ščiti popolno.

Podjetje se kljub mladosti in poslovni usmeritvi zaveda svoje transakcijske izpostavljenosti valutnemu tveganju, ki se izvaja s popolnim zavarovanjem odprtih pozicij v madžarskih forintih in romunskih RON-ih z uporabo forward hedge-ov. Poleg uporabe zunanjih metod ščitenja v primeru forinta in RON-a, podjetje uporablja tudi notranje metode ščitenja, kakršna je valutna klavzula v primeru srbskega dinarja. Magistrsko delo prav tako dokaže omejeno možnost zunanjega ščitenja s finančnimi instrumenti v primeru srbskega dinarja. Po drugi strani pa podjetje ne ščiti pozicij v hrvaški kuni, kar lahko razložimo z nizko stopnjo volatilnosti kune, ki skupaj z manjšimi netiranimi pozicijami podjetja v hrvaški kuni lahko povzroči le manjšo stopnjo transakcijske izpostavljenosti. Kot razlog za odločitev podjetja o svoji trenutni strategiji ščitenja pozicij v tujih valutah lahko navedemo tudi omejene možnosti ščitenja, ki so rezultat statusa valut (dinar, kuna, forint itd.) znotraj mednarodnih valutnih

tokov.

- Trenutni organizacijski okvir podjetja za upravljanje izpostavljenosti zaradi valutnega tveganja še ni pripravljen za ocenjevanje in upravljanje ekonomske in prevedbene izpostavljenosti.

Podjetje ima potencial za možne izboljšave v smeri ustanovitve oddelka za obvladovanje tveganj in dnevno spremljanje ter obvladovanje izpostavljenosti valutnim tveganjem.

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