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Tools and Techniques for the Management of Foreign Exchange Risk: Forward Foreign Exchange Auctions in Local Currency Applications Across Turkey, Mexico, Brazil and Indonesia

Döviz Riskinin Yönetimine Yönelik Araç ve Teknikler: Türkiye, Meksika, Brezilya ve Endonezya Genelinde Yerel Para Uygulamalarında Vadeli Döviz İhaleleri

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ÖZ

Ekonomik birimlerin, yatırım kararları alırken ve ticari faaliyetlerini sürdürürken karşı karşıya kaldıkları en büyük risk, geleceği doğru tahmin edememektir. Finansal serbestleşme ve globalleşme süreçleri ile birlikte, ihracat ya da ithalat yapan firmalar, finansal veya finansal olmayan risklerle karşı karşıya kalmaktadır. Bu nedenle işletmeler gelecekte maruz kalabilecekleri finansal risklerden, vadeli piyasalarda işlem yaparak korunmaya çalışmaktadır. Çalışmanın amacı, döviz piyasalarındaki derinliği arttırmak ve ulusal paraların değerinde meydana gelen yüksek volatiliteyi azaltmak amacıyla dünyada ve Türkiye'de uygulamaya konulan ulusal para birimi uzlaşmalı vadeli döviz alım-satım ihaleleri üzerine bir değerlendirme yapmaktır. Yapılan araştırmada, yerel para uzlaşmalı vadeli döviz satım ihalelerinin, gerek ihalelere gelen teklif miktarları gerekse ihalelerde oluşan fiyatların rekabetçi biçimde oluşması dikkate alındığında, piyasa açısından etkili bir araç olma potansiyeli taşıdığı kanaatine ulaşılmıştır.

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ABSTRACT

The greatest risk faced by economic agents in making investment decisions and continuing their business activities is not being able to predict the future. Along with the financial liberalization and globalization processes, companies exporting or importing face financial or non-financial risks. Therefore, companies try to protect themselves from future financial risks by trading in futures markets. The purpose of this study is the foreign exchange to increase the depth of the market and to reduce the high volatility in the value of the national currency in order to put into practice in the world and Turkey should reconcile national currency forward contracts, to make an assessment on selling auctions. In the research conducted, it was concluded that the forward foreign exchange auctions in domestic currency, which has the potential to be an effective tool in terms of the market, considering both the bid amounts received and the prices formed in the auctions in a competitive manner.

1. Introduction

Since the gold standard era, exchange rates have always fluctuated due to demand and supply shocks in the international market. With the liberalization of capital and the domination of the market economy, foreign exchange risk has started to take an important place in financial risks. Especially in developing countries, high volatility in

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exchange rates in accordance with the direction of global cash flows has brought the perception of exchange rate risk to the fore even in companies that do not export or import and establishing risk management units against this risk has become essential.

Exchange risk and hedging is an important task for companies that are exposed to exchange rate risk and want to minimize uncertainty about unexpected changes in the exchange rate. Firm managers are aware of the need to manage foreign exchange risk from a strategic perspective and take into account the long-term exchange rate movement and its impact on future cash flows (Dhani and Groves, 2001).

In the globalizing world, the exchange rate is directly linked to the transactions of firms. This connection occurs when firms have contracts in foreign currencies. In particular, when a firm issues goods under import contract obligations or imports intermediate inputs, when the transaction becomes clear in the future, it is exposed to exchange rate movements in terms of the need to convert revenue and cost into a national currency.

Firms operating in international markets use various techniques to be protected against losses arising from exchange rate risk. Some of the techniques of hedging against foreign currency risk in financial markets are; forward foreign exchange transactions, futures, foreign exchange options, swaps etc.

2. Foreign Exchange Risk Definition and Varieties

Exchange rate risk is a measure of a firm's profitability, cash flow and market value's potential to change due to changes in exchange rates (Eiteman, Stonehill and Moffett, 2004).

Investorwords (2019) defines exchange risk as the risk of being affected by changes in foreign exchange rates of an enterprise's activities or investment value, while investopedia (2019) takes a different perspective by defining it as the risk that an investor should take.

This situation is called ‘net foreign exchange position’. If the expected cash inflows exceed the cash outflows, there will be a long position, and vice versa, if the expected cash outflows exceeds the cash inflows, there is a ‘short position’. The situation that cash inflows and cash outs are equal in a certain period is called square position (Rodriguez and Carter, 1984). Losing a long or short position in a foreign currency due to negative fluctuations in foreign exchange rates; It is defined as "foreign exchange risk". This definition shows that exchange rate risk generally affects firms that export and / or import, but may also affect investors who invest internationally (Ganti, 2020).

The greatest risk faced by firms when making investment decisions and continuing their commercial activities is not being able to accurately predict the future. Especially firms exporting or importing have to follow these fluctuations very carefully as they face uncertainties caused by exchange rate changes. Some negativities that may occur in the opposite direction of the positions taken by firms in this regard may cause great financial losses to firms.

However, unless fluctuations in the exchange rate can be accurately predicted, it will create an uncertainty about the size of the profit expected from foreign trade (Maskus, 1986).

One of the functions of the foreign exchange market is to provide insurance against the risks that may lead to negative consequences of unforeseen changes in the exchange rate, which is defined as the rate of converting a currency to another currency. Exchange rate risk is also defined as the possibility of loss in economic and financial transactions as a result of negative movements in the contract currency, between the date of signing and the maturity date (Allayannis, Ihrig and Weston, 2001).

Choosing the appropriate hedging method is often seen as a difficult problem to solve for companies due to the complexity of measuring the current risk and deciding on the right risk degree. Firms need to know the types of exchange rate risk in order to take precautions against losses that may occur as a result of changing the exchange rate and to minimize the losses arising from the risk.

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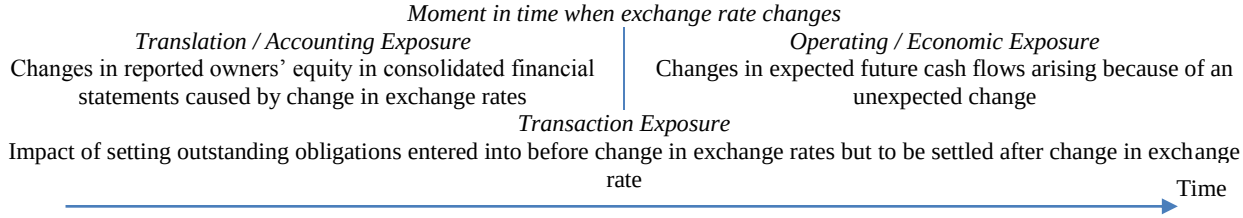
Assuming that firms are exposed to currency risk brings additional responsibility to the company manager. This responsibility requires measuring exposure and maximizing the firm's profitability, net cash flow and market value based on these measures (Marshall, 1999). The important point at this point is to know what kind of exchange rate risk they face in order to take measures against losses that may arise as a result of changing the exchange rate and to minimize the loss arising from the risk.

The success and failure of any firm depends on three financial factors: profit, market value and net cash flow. These elements may be exposed to currency risk. The three risks depend on the duration of the exchange rate and its consecutive effects on business initiatives today or in the near future.

Figure 1. Traditional Exchange Rate Exposure Types When the Exchange Rate Changes



Source: Eiteman, Stonehill and Moffett, 2011.

However, the exchange rate risk may arise from the various works performed by the firms or the way the financial results of the firm are expressed as a result of the fluctuation in the currency. Therefore, the exchange rate risk encountered due to foreign currency transactions is divided into three categories for firms. These; transaction risk, translation risk and economic risk.

(i). Transaction Exposure

To what extent the value of a firm's future cash transactions arising from current contractual liabilities may be affected by exchange rate fluctuation is known as transaction risk (Tiwari, 2019).

In other words, since the value of foreign currency contracts is affected by exchange rate movements, the sensitivity of the firm's foreign currency contract transactions to exchange rate movements is called transaction risk (Madura, 1996). Transaction risk is the changes in the cash flow resulting from the current contractual obligations as a result of fluctuations in a firm's exchange rates (Krister and Wedøe, 2010).

Transaction risk is mainly based on the effect of exchange rate movements arising in the transactions related to the payment of receivables arising from cash flows and debts or dividends arising from import contracts (Papaioannou, 2006). The risk arising from the exchange rate change in a contract causes direct transaction risk for the firm. Transaction risk can have significant effects on a firm's value. Although it is not unusual for a currency to change by 10 percent in a given year, if an exporter expresses its exports in foreign currency, a 10 percent decrease in this currency will decrease the dollar value of their receivables by 10 percent. This effect can also eliminate any profits from exports (Madura, 1996).

Accordingly, the activities that firms are likely to encounter with transaction risk can be listed as follows (Mishra, 2019);

- Purchasing or selling on credit goods and services when prices are stated in foreign currencies,
- Being a party to a forward agreement made in terms of foreign currency with low performance,

Obtaining assets or other liabilities valued by a foreign currency.

(ii). Translation Exposure

Translation risk, also known as accounting risk, arises when firms convert their assets and liabilities in foreign currency to "currency" for the purpose of finalizing accounts for a certain period (Francis, 2010).

Translation exposure is related to firm size, multinational status, foreign sales, international assets, and competitiveness and trade at the industry level hence the firms must vigorously adjust their behavior in response to exchange rate risk (Ukessays, 2019).

The necessity of foreign currency accounting contents translation is particularly significant in the recording of foreign currency transactions in the books of accounts and the preparation of an individual company's financial statements as well as the consolidation of foreign subsidiaries' financial statements with their parent company's financial statements on condition that they are not expressed in a common currency (Bogicevic, 2013).

Adequately translated financial data not only eliminate the information asymmetry between domestic and foreign users of accounting contents, but they are also a 'conditio sine qua non' for the international group financial statements consolidation and segment reporting (Bogicevic, 2013).

While preparing the financial statements of subsidiaries operating abroad, the results of the activities must be reflected in the financial statements of the parent firm. However, since subsidiaries prepare their financial statements with the money of the relevant country, accounting risk arises in reflecting the results of the activities to the financial statements of the parent firm, and thus, it can be reported with the monetary units of different institutions under the corporate roof to create consolidated financial statements worldwide (Law, 2014).

Accounting risk is the type of exchange rate risk encountered when the financial statement items expressed in foreign currency are converted into the national currency

due to the accounting transactions (Papaioannou, 2006). Accounting risk of financial assets for partnerships with branches in a foreign country is generally measured by exposure of net assets to possible exchange rate movements. Accordingly, accounting risk refers to the losses and earnings that arise for the parent firm due to the conversion of the affiliate balance sheets according to different rates (Seyidoğlu, 1996).

While the transaction risk arises as a result of physical trading, there is no physical trading in accounting risk. Accounting risk is based on cash flow or stock price perspective. Accounting risk of multinational companies depends on:

- The rate of work carried out by foreign affiliates,
- Locations of foreign affiliates,
- The accounting method it uses.

The greater the percentage of work carried out by foreign affiliates of the multinational firm, the greater the percentage of a particular financial statement item will be.

The locations of subsidiaries and the financial statement items of each subsidiary are typically measured in the country currency of the subsidiary, so they can affect the accounting risk. Accounting risk of a multinational company can be greatly affected by the accounting procedures used when consolidating the financial statement data (Madura, 1996).

(iii). Economic Exposure

Economic exposure, also referred to as operational exposure is similar to the two exposures mentioned above in the sense that it arises out of the unanticipated changes in the exchange rates of the country but unlike them operating exposure is said to have a long -term effect on the MNEs and therefore holds a lot more significance in eyes of the management.

The economic risk, also referred to as operational risk, resembles accounting and transaction risk in terms of the unexpected changes in the country's exchange rates, but unlike them, economic risk is said to have a long-term impact on Multinational Corporations (MNCs), and therefore much more is of great importance. Economic risk is more difficult to measure than transaction risk, as it also takes into account the effects of changes in future cash flows on the current value of the MNCs and its competitive position in the market. While making this determination, it is analyzed how the exchange rate changes affect items such as product and service prices, operating costs, revenues, profits, contributions and competitive advantage (Tiwari, 2019).

Economic risk expresses the effects of unexpected fluctuations in exchange rates on the future cash flows and firm value of the business (Holland, 1993). The exchange rate movements affect the financial structure of the firm and reflect the risk of the future cash flows to the current value of the firm (Papaioannou, 2006). The source of economic risk is the change in the competitiveness of imports and exports. The main difference between transaction and economic risk; The first is that it focuses only on changes in pre-committed cash flows, and the second focuses on changes in all future cash flows expected (Krister and Wedøe, 2010).

Exchange rate changes may cause changes in the relative prices of the firm's inputs and outputs. Relative price changes affect the firm's competitive market position by causing changes in cash flows and eventually firm value (Glaum, 2000).

2.1. Currency Risk Management

Currency risk management is the effective struggle against risks in order to identify and evaluate the risks faced by firms while performing their activities and to eliminate or reduce possible losses. Risk management is a process in which a number of future decisions are made based on bank policies and strategies to ensure that the risk based on losses due to future exchange rate fluctuations and the risk-free returns of assets are minimized to minimize profit (Ghosh, 2012: 45).

Hedging means minimizing the risk of exchange rate fluctuations. Therefore, it enables a firm that is exposed to foreign exchange risk to minimize the uncertainty of future transactions in foreign currency and to clarify future cash and profit flows (Goel, Gupta and Goel, 2011).

The need for currency risk management started to arise after the break down of the Bretton Woods system and the end of the U.S. dollar peg to gold in 1973. In the floating exchange rate regime that was put into practice instead of the Fixed Exchange rate regime after the Bretton Woods system, exchange rates can change instantly and it is difficult to predict its future value, as the exchange rates are determined by the supply and demand in the market. Fluctuations in the exchange rate expose foreign currency firms to foreign exchange risk. In this context, the higher the unexpected fluctuations in the exchange rate, the firms in question face a higher exchange rate risk (Papaioannou, 2001). In this context, multinational companies have established risk committees within their bodies to oversee the exchange rate risk management strategy (Lam, 2003). This shows the importance companies attach to risk management issues and techniques.

Firms will have the following gains by hedging (Eiteman, Stonehill & Moffett, 2011).

- The major motive for firms to hedge is to increase the present value of firms,
- The value of a firm, according to financial theories, is the present value of all expected future cash flows in the future,
- For expected cash flows with higher uncertainty (or risk), a higher discount rate should be applied to

calculating the present value and thus a lower present value for these cash flows is generated,

- A firm that hedges foreign exchange exposures reduces the variance (or risk) in the value of future expected cash flows. Thus, a lower discount rate is employed to calculate the present value of expected future cash flows, which implies the increase of the present value of the firm.

Many firms try to manage foreign exchange risks through hedging. Hedging will not increase the expected value for a cash flow. Actually, if taking the hedging cost into account, hedge transactions will decrease the expected cash flow. Hedging reduces the variability of future cash flows about the expected value of the distribution. This reduction of distribution variance is a reduction of risk. However, reduction in the variability of future cash flows may not be sufficient reason for currency risk management.

Opponents of currency hedging commonly make the following arguments;

- Shareholders are much more capable of diversifying currency risk according to their individual preferences and risk tolerance than the management of the firm,
- Although currency risk management can reduce the variance, it reduces the expected cash flow due to hedging costs, so, the net benefit of hedge depends on the trade-off between these two effects,
- Hedging activities are sometimes conducted to benefit the management at the expense of the shareholders. For instance, the true goal of hedging the variance of the company's income is to ensure the bonus of the management,
- Management may overuse the expensive hedge,
- Management may believe that it will be criticized more severely for incurring foreign exchange losses than for incurring similar or even higher hedge costs in avoiding the foreign exchange loss,
- Possibly due to the accounting rules: because the foreign exchange losses appear in the income statements as a highly visible item or as a footnote, but the hedging costs are buried in operating or interest expenses,
- Efficient market theorists believe that investors can see through the "accounting veil" and therefore have already factored the foreign exchange effect into a firm's market valuation,
- Although the translation exposure are only "paper" losses, there are still some firms to hedge this risk. However, the above argument implies that it is not necessary to hedge the translation (accounting) exposure.

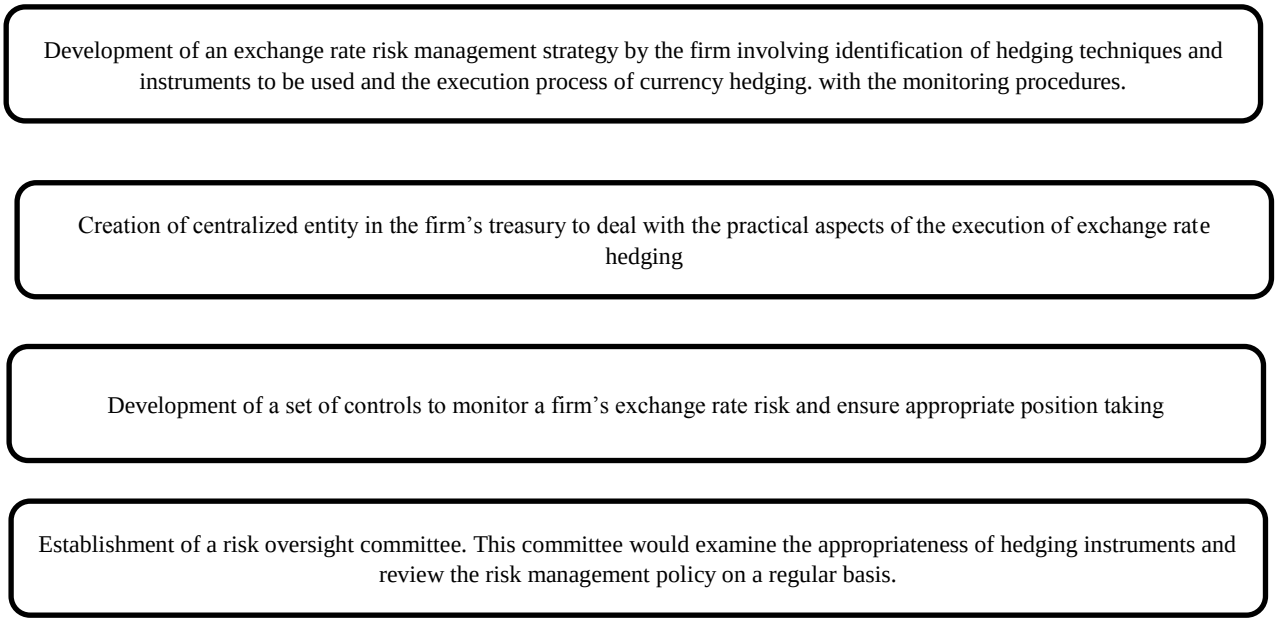
- Proponents of hedging cite the following arguments;
- Hedge can reduce the variance of future cash flows and thus may increase the firm's present value by reducing the discount rate,
- Firms should focus on the main business they are in and take activities to minimize risks arising from interest rates, exchange rates, and other market variables,
- Management is in better position than shareholders to recognize disequilibrium conditions quickly and to undertake the hedging activities immediately,
- Management has a comparative advantage over individual shareholders in estimating the actual currency risk of the firm and taking the correct hedging strategy,
- Reduction in risk in future cash flows improves the planning capability of the firm. Therefore, the firm can undertake more investment projects that it might not consider before,
- Since a firm must generate sufficient cash flows to make debt-service payments, reduction of risk in future cash flows reduces the likelihood that the firm's cash flows will fall below a necessary minimum (This minimum level of cash flows is also terms as the point of financial distress) (Eiteman, Stonehill ve Moffett, 2011).

Measuring and managing currency exposure is important to reduce the vulnerabilities of a firm that may result in exchange rate movements and negatively affect the value of profit margins and assets (Papaioannou, 2006). Foreign currency risk does not only affect cash flows or financial situation, but also affects the future competitive conditions and potential sales of firms. Exchange rate risk management, which aims to reduce the negative effects of currency fluctuations, is an integral part of the firm's risk decisions.

Every foreign exchange trading company is obliged to develop, implement and audit the appropriate procedure to manage and control the exchange rate risk in terms of the negative impact that the risk may have on the firm's profit margin and assets.

A company that is exposed to significant risk should form an operational framework of best practices, as outlined in Figure 2 (Tiwari, 2019).

Figure 2. Steps to Measure the Currency Risk



Source: Adapted from Papaioannou, 2006

3. Hedging Methods for Exchange Rate Risk

Firmwide risk management for multinational corporations (MNCs) is defining as the combined use of both financial and operational hedges as part of an integrated risk management strategy aiming at reducing exposure to foreign-exchange risk. Firmwide risk management is the coordinated use of both financial hedges, such as currency derivatives, and operational hedges, described by the structure of a firm's MNCs foreign subsidiary network, to manage currency risk (Carter, Pantzalis and Simkins, 2003).

Hedging, which is one of the risk management strategies is an approach designed to reduce or offset a possible loss arise due to unknown fluctuations in the investment prices and to lock the profits therein. Hedging can also be used to improve or maintain competitiveness. Companies don't exist in isolation; they compete with other domestic companies in their sector as well as globally (Tiwari, 2019).

3.1. Financial Hedging Methods

It is recommended that firms facing foreign currency risk and who do not act speculatively and who want to avoid the risk should be able to foresee the future cash and profit flows or to prevent fluctuations in them, by protecting open foreign exchange positions with one or more of several protection techniques. It is possible to divide the financial hedging method, one of the methods used for hedging purposes, into internal / natural (internal / natural) protection techniques and external protection techniques (Giddy and Dufey, 2012).

3.1.1. Internal Hedging Methods

Internal methods are the methods that the bank applies within its own structure against risks (Robinson, 2010).

3.1.1.1. Netting

The number of transactions carried out by the company can be reduced by consolidating and clarifying the risks of all units or subsidiaries. It is the most commonly used natural hedging method for most firms. A centralised unit such as the firm's treasury takes responsibility for identifying cash inflows and out flows denominated in the same currency between subsidiaries. Thus, transactions are reduced to ones that involve only payment of the difference between cash inflows and outflows (Sume, 2009)

3.1.1.2. Matching

Matching refers to the process in which a company matches its currency inflows with its currency outflows

with respect to amount and timing. When a company has receipts and payments in same foreign currency due at same time, it can simply match them against each other. Hedging is required for unmatched portion of foreign currency cash flows. This kind of operation is referred to as natural matching. Parallel matching is another possibility When gains in one foreign currency are expected to be offset by losses in another, if the movements in two currencies are parallel is called parallel matching (Gupta, 2016).

3.1.1.3. Leading and Lagging

Leading and lagging includes the time adjustment of payments or receivables, which aim to protect foreign currency losses by speeding up the collection of foreign currency receivables that are expected to depreciate and delaying their debts and accelerating their payments in foreign currency expected to gain value. A firm can reduce both operating and transaction exposure by leading (advancing) payables and lagging (postponing) receivables in "strong" currencies, and conversely, leading receivables and lagging payables in "soft" currencies. In a sense, lagging is delaying payment of weakening currencies and postponing receipt of strengthening currencies (Gupta, 2016).

3.1.1.4. Pricing Policy

There can be two types of pricing tactics: price variation and currency of invoicing policy. Price variation can be done as increasing selling prices to offset the adverse effects of exchange rate fluctuations. However, it may affect the sales volume of the firm. So proper analysis should be done regarding customer loyalty, market position, competitive position before increasing price (Gupta, 2016).

Another alternative is billing in the domestic currency. A way to avoid the total currency risk is to make invoices in the domestic currency. However, the currency risk is in this way only transferred to the foreign importer. Even if the firm has made the invoicing in domestic currency, changes in the exchange rate may cause the firm to lose its competitive conditions or decrease its sales volume. Therefore, items related to risk sharing can be included in the agreement between firms to reflect the effect of exchange rate fluctuations to both parties (Gupta, 2016). This is often the situation between firms with continuing buyer-supplier relationship, and it may help to maintain mutually beneficial long (Tiwari, 2019).

3.1.1.5. Government Exchange Risk Guarantee

Government agencies in many countries provide insurance against export credit risk and introduce special export financing schemes for exporters in order to promote exports. In recent years a few of these agencies have begun to provide exchange risk insurance to their exporters and the usual export credit guarantees. The exporter pays a small premium on his export sales and for this premium the government agency absorbs all exchange losses and gains beyond a certain level tutmaktadır (Gupta, 2016).

3.1.2. External Hedging Methods

The external hedging instruments are used for hedging the firm's cash flow against outcomes (Robinson, 2010). External hedging is done through derivative products. Derivative products can be used for different product groups and for different purposes. Foreign trade firms generally use foreign currency derivatives. Foreign currency futures; are contracts that give the obligation to buy or sell foreign currency in a certain term, at a predetermined exchange rate, quantity and breed. Foreign trade companies mostly use foreign currency derivatives for hedging. A company that wants to benefit from the external hedging technique can provide hedging against exchange rate risk through a bank channel or derivative markets. While external hedging is often seen to be more costly and more complex than internal hedging, these external techniques often yield successful results (Popov and Stutzmann, 2003).

3.1.2.1. Forward Contracts

Futures contracts are the currency risk management tool in which a certain amount of foreign currency is bought and sold at a future date at the exchange rate determined from today. The corporations can enter into forward contracts for the foreign currencies which it need for payment or which it will receive in future Since the rate of exchange is already fixed for the future transaction, there will be no variability in the cash flows. Hence, changes that take place between the contract date and the actual transaction date does not make any impact. This will eliminate the foreign exchange exposure. The future settlement date can be an exact date or any time between two agreed dates (Gupta, 2016).

3.1.2.2. Currency Futures

Currency futures contract involves a standardized contract between two parties to buy/sell an amount of currency at a fixed price on a specified date in the future and are traded on organized exchanges. Futures contracts are more liquid than forward contracts as they are traded in an organized exchange. A depreciation of currency can be hedged by selling futures and currency appreciations can be hedged by buying futures. Thus, inflow and outflow of different currencies with respect to each other can be fixed by selling and buying currency futures, eliminating the foreign exchange exposure. (Gupta, 2016).

3.1.2.3. Currency Options

Currency options are contracts which provides the holder the right to buy or sell a specified amount of currency for a specified price over a given time period. Currency options give the owner of the agreement the right to buy or sell but not an obligation (Gupta, 2016).

The main difference of option contracts from futures is that, in options, the right to buy or sell certain currencies at a price already agreed in the future; In foreign currency futures contracts, certain foreign currency has an obligation to buy or sell at a price already agreed in the future. While not having to exercise this right in options, the obligation must be fulfilled in foreign exchange futures contracts. Option contracts are traded in both organized markets and over-the-counter markets.

3.1.2.4. Currency Swaps

Currency swap is an exchange agreement that allows cash flow exchanges between two or more parties, according to a predetermined maturity, in which both parties exchange different interest payments and different currencies in a certain period of time (Gupta, 2016).

3.1.2.5. Foreign Currency Debt

Foreign debts are an effective way to hedge the foreign exchange exposure. This is supported by the International Fischer Effect[1] relationship. For example, a company is expected to receive a fixed amount of Euros at a future date. There is a possibility that the company can experience loss if the domestic currency appreciates against the Euros. To hedge this, company can take a loan in Euros for the same time period and convert the foreign currency into domestic currency at the spot exchange rate. And when the company receives Euros, it can pay off its loan in Euros. Hence the company can completely eliminate its foreign exchange exposure (Gupta, 2016).

3.2. Operational Hedging

Operational hedging method, another of currency risk management, emerges as a result of a firm's active transactions and its types are too many to list.

Operational hedging, a subset of strategic risk management, refers to the adjustment of strategies and the structuring of resources and processes to proactively reduce, if not eliminate, future risk exposure (Mieghem, 2009). For example, a multinational firm locating manufacturing facilities in foreign markets is an example of a real option that provides an operational hedge against currency fluctuations. A firm's ability to adjust output and thus cost is another important real option that functions as an operational hedge (Treanor, Carter, D.A., Rogers, D.A. and Simkins, 2013).

A firm can use both financial and operational protection methods at the same time and sometimes, however, complementing operational hedging with financial hedging may not be possible. For example, the planning horizon for a production facility may exceed 10 years. While operational hedging can be used, it is unlikely that financial hedging is available over that time-horizon. Financial hedging of capacity is also problematic if there is no capacity futures market that can replicate the capacity's cash flows (a swap can always be constructed if a counter party is available). Whether a company should use both financial and operational hedging is the topic of current academic research. The answer depends on the type of financial contract, the operational system, and the correlation between the underlying financial asset and the operational risk under consideration. With perfect correlation, operational flexibility and financial hedging can complement each other (Mieghem, 2009).

There is very limited empirical evidence on the combined use of financial and operational hedging measures in exchange rate risk management. One of the studies showing these findings is the study of Allayannis, Ihrig and Weston (2001) and found that operational protection is not effective for risk management.

The globalizing world has made the exchange rate directly linked to firm transactions. This link arises when companies have contractual arrangements in foreign currencies (Glaum, 2005). In particular, when a company exports goods or imports intermediate inputs under foreign-denominated contract obligations, it becomes exposed to the movements of foreign exchange rates in terms of the need to translate these revenues and costs into domestic currency when the transaction clears in the future. As long as volatility is costly for firms, higher Exchange rate exposure leads to more financial hedging. However, when firms both export and import at the same time, their net foreign-denominated position (and thus the actual exchange-rate exposure) becomes lower, providing for fewer incentives to hedge against it (Kuzmina and Kuznetsova, 2017).

Carter, Pantzalis and Simkins (2001) investigate the impact of firmwide risk management practices for US multinational corporations and find that currency risk can be reduced effectively through transactions in the forward exchange market. However, they find that operational and financial hedges are complementary risk management strategies. These studies analyze the relation between operational hedging and financial hedging and underscore the effectiveness of both strategies by conducting empirical analysis based on firms' stock return.

Allayannis, Ihrig and Weston (2003) also investigate both financial and operational exchange-rate risk management strategies of multinational firms and confirm that operational hedging strategies benefit shareholders only when used in combination with financial hedging strategies. Kim, Mathur and Nam (2006) investigate how operational hedging is related to financial hedging. They confirm that although operational and financial hedging

strategies are complementary, firms using operational hedging are less dependent on the use of financial derivatives.[2]

Bartram, Brown and Fehle (2009), report that about 60% of non-financial firms around the world use financial derivatives (forwards, futures, swaps, etc.), with the most popular type being currency derivatives (44%). These large numbers indicate the importance of risk management in general and hedging exchange-rate shocks in particular. The literature has suggested other ways of reducing such cash-flow volatility – through operational hedges. The examples include diversifying the company's operations and production geographically (Allayannis, Ihrig and Weston, 2001; Kim, Mathur and Nam, 2006).

4. Applications for Hedging of Firms in Turkey

Currency risk in financial risks brought about by globalization have begun to take an important place, especially the exchange rate fluctuations have occurred in developing countries like Turkey has made risk management an imperative.

The economic decisions taken on 24 January 1980 with non-statist structure and leave off Turkey's economy to foreign trade import-substitution policies, export promotion rather than passed to the way foreign trade policy. In order to facilitate the implementation of this policy, it has decided to implement the method of removing foreign exchange controls and setting foreign exchange rates free in the market. At the same time, the emerging liberalization tendency caused the foreign currency controls to disappear, while the increase in exports and the increase in foreign exchange transactions caused constant fluctuations in the exchange rates, and therefore, faced with new risks in the financial management of the enterprises. The process of determining the price of the product in domestic currency while selling, making the sale in foreign currency, making the collection after foreign currency, and treating the foreign currency to the domestic currency in the domestic market caused multiple effects on the foreign currency risks. As a result, many financial techniques need to be applied in terms of hedging foreign currency risk.

Using hedging techniques is an effective tool for managing and controlling exchange rate risk. Turkey also is being used to protect many financial instruments for risk management purposes, the date and comes at the beginning of the new financial instruments and derivative markets.

4.1. Derivative Markets

The diversity and development of derivatives has an important place among all financial products worldwide. Derivative products have also been widely used in the Turkish banking sector in order to control and protect the risks such as the exchange rate and interest rate, which have increased with the financial crises experienced in recent years. Derivative markets, one of the most important factors in the functioning of the financial system for developing countries, have been intensely included in the Turkish financial system since the 1990s.

Derivative markets are defined as the markets where any good or financial instrument is traded today for delivery or cash settlement at a future date. The definition of derivative markets includes forward, futures, swap and option contracts (Ersan, 1996: 42).

The markets where derivative products are traded are called derivative (futures) markets, and the products traded in these markets are called derivative products. Turkey's financial markets in the derivatives market are the most widely used products futures contracts (Apak and Uyar, 2011: 3).

4.1.1. Future Contracts

These are the contracts between the buyer and seller that regulate the purchase and sale of a standard quantity and quality asset at a predetermined price in the future (Aydın, Başar and Coşkun, 2007: 520-531).

Futures contracts allow the spread of transparent information in the markets due to the continuous pricing of uncertainties that may occur in the future. One of the most important benefits of these products is the price determination for future uncertainties in the underlying asset. In addition, derivative products have a very important insurance function in terms of managing future risks (Saltoğlu, 2014).

The most basic function of the markets in which derivative products are traded is the hedging function. Derivative products minimize risks against unexpected changes in prices, interest rates and exchange rates and provide the opportunity to hedge by taking appropriate positions for these risks. With hedging, risk is transferred to speculators. Thus, derivative products will provide the function of effectively distributing risks among different individuals and groups in the economy (İbis, 2015). Derivative products are used by firms and individuals to hedge against transaction risk and importers and exporters to hedge against currency risk (Apak & Uyar, 2011: 12).

4.1.1.1. Forward Foreign Exchange Auctions in Domestic Currency

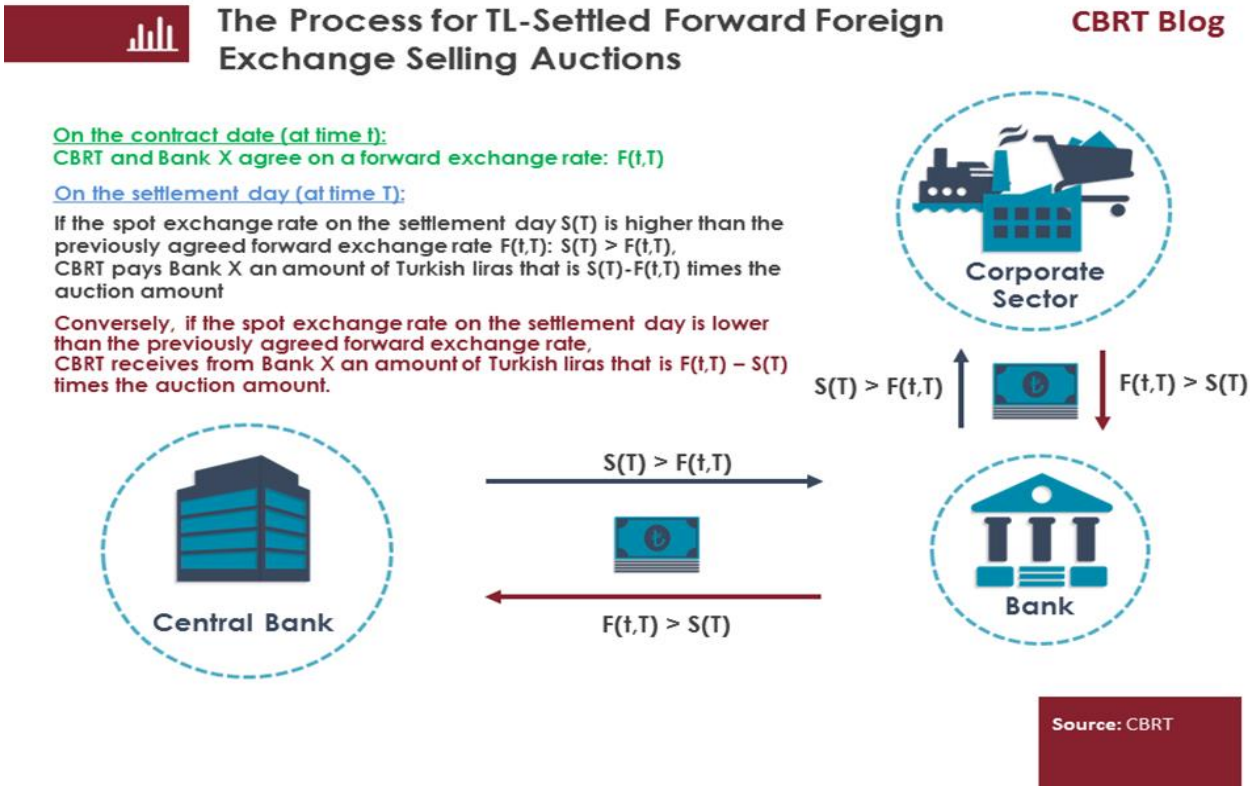
Forward foreign currency trading is a derivative product that obliges one currency to buy or sell its future value at the agreed price at the end of a predetermined maturity against another currency. 'Forward Foreign Exchange Auctions In Domestic Currency' is a new derivative product based on cash settlement in TL, where the parties do not change their principal at the end of maturity.

In order to hedge against currency exchange risk in the corporate sector, the Central Bank of the Republic of Turkey has started its 'Forward Foreign Exchange Auctions In Domestic Currency' should in 20.11.2017.

In the maturity dates, if the spot rate occurs below or above the exchange rate formed in the auction, the banks / CBRT pay the difference between the spot exchange rate and the forward exchange rate to the opponent party in TL. In these transactions, the CBRT is in the foreign exchange position and the banks that win the auction are in the foreign exchange purchase position. Banks can transfer their foreign exchange buying positions to the real sector or foreign markets as reverse positions in order to provide financial hedging against foreign exchange risk.

The position amount in the forward foreign currency purchase and sale auctions, and the price and maturity are the basic elements that need to be decided first. As part of the Forward Foreign Exchange Trading Program in Turkish Lira Currency, the CBRT organizes auctions in various maturities. These transactions are carried out at multiple prices using the traditional auction method with the banks that are members of the foreign exchange markets. The banks participating in the auctions transmit the amount of foreign currency they want to take positions for the relevant maturity and forward exchange rates. In the auction process, 2.5% of the foreign currency earned in the auction must be kept against the possible price and exchange rate changes at the CBRT. The auction is left on the bank that offers the highest exchange rate bid in the auction.

Figure 3. Central Bank Forward Foreign Exchange Auctions in Domestic Currency Process



In the event that the spot rate on the maturity date is above the exchange rate formed in the auction, the CBRT pays the difference between the spot exchange rate and the forward exchange rate in TL to the other party.

If it is realized above the spot exchange rate at the end of the term and below the agreed level, the CBRT is in the position to collect payment from the other party. In both cases, there is no change in the foreign exchange reserves of the Central Bank since no foreign currency payments are made on the maturity date. By using the advantage of net foreign exchange reserves, the Central Bank aims to increase the depth and efficiency in the forward foreign exchange markets to reduce volatility in foreign exchange markets (Kucuk, Guney and Kucuksarac, 2017).

Between 20.11.2017 - 31.12.2018, 312 auctions were held and $ 36.71 billion was sold in 240 of these auctions. Since there were no offers in 72 auctions, no sales were made. In the auctions held, the average selling rate was TL 4,65828.

Table 1. Central Bank Forward Foreign Exchange Auctions in Domestic Currency

Maturity (Day)	Number of Auctions Performed	Sale (MIO USD)
27	1	150
28	136	25358
29	2	300
30	5	750
31	8	1200
32	5	750
33	1	150
56	7	1842
90	4	309
91	40	3329
92	3	300
98	2	200
181	2	200
182	24	1874
Total	240	36.712

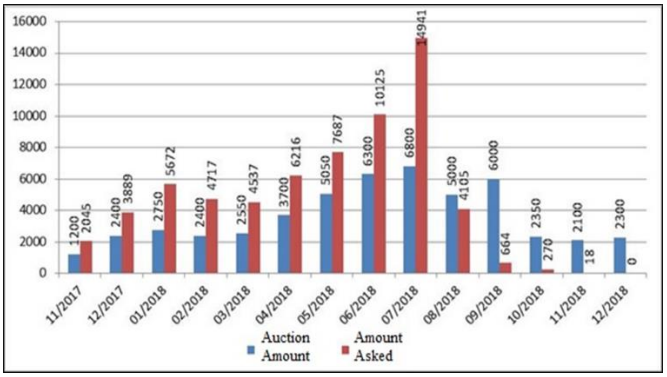
Number of Auction with Bid	240
Number of Auction Without Bid	72
Total	312

With the implementation of the Forward Foreign Exchange Auctions in Domestic Currency, domestic firms can hedge their foreign currency denominated debts and foreign investors' investments in the domestic currency against currency risk. In cases where institutional firms put forward foreign exchange demands to pay foreign currency loans in periods of depreciation in Turkish Lira, spot and forward foreign exchange market rates increase together. In Figure 4, the relationship between the weighted average price of the bids submitted to the auctions and the USD / TL exchange rate is given during the auction, and the weighted average price is generally above the USD / TL exchange rate.

Figure 4. Forward Foreign Exchange Auctions in Domestic Currency Average Dollar Sales Rate - USD / TL

While the total auction amount made by the Central Bank of the Republic of Turkey until 31.12.2018 was 46.7 Billion USD, the total bid amount was 64.8 Billion USD. Particularly, the bid amount made in the auctions held in July 2017 exceeded the total auction amount. In this case, the Central Bank tried to limit the foreign exchange demand, which was brought to the forefront in the spot market by increasing the total auction amount to 6.8 billion USD in July 2018. However, the total bid amount in this period increased to 14.9 billion USD (Chart2).

Figure 5. Forward Foreign Exchange Auctions in Domestic Currency Sale Auction and Bid Quantities



With the Forward Foreign Exchange Auctions in Domestic Currency Transactions, the private sector, which has a highly loaded foreign currency open position, enabled them to manage the exchange rate risk in a more liquid market with better prices. On the other hand, since the CBRT did not sell foreign currency directly and only paid the difference in Turkish Lira, there was no decrease in its reserves.

Generally, the private sector, which is cautious about hedging in general, made a high demand for Forward Foreign Exchange Auctions In Domestic Currency Sale Auctions, especially between 20.11.2017 - 08.08.2018, where the exchange rate volatility was high.

In the auctions after this date, the bid amount remained below the bid amount, and the balance was balanced in the 5.30 band, and no bids were submitted for the tenders opened as of 06.11.2018.

5. Forward Foreign Exchange Auctions in Domestic Currency Applications in Worldwide

The first application was made by the Central Bank of Brazil to prevent fluctuations in the exchange rates with Forward Foreign Exchange Auctions in Domestic Currency agreements. With the application started for trial purposes in June 2013, the desired result could not be achieved initially, but the increase in the exchange rate was stopped with the intervention of 100 billion dollars between August 2013 and April 2014. Brazil Real has gained more than 10% value against the currencies of developing countries (Garcia & Volpon, 2014).

DNDF (Domestic Non-Deliverable Forward), which is the intervention strategy of the Central Bank of Brazil (BCB), has been an effective means of protection for economic units during periods of reduced capital inflows and exchange rates. In addition, with the strategy using DNDFs, the US dollar was entered into Brazil through commercial banks, thus financing the current account deficit.

BCB's DNDF policy is an alternative intervention strategy only because of the features and legislation unique to the

Brazilian financial market. It is observed that other developing countries with different market characteristics may benefit from adopting a similar approach (Garcia & Volpon, 2014).

In Mexico, another country that successfully implemented the Forward Foreign Exchange Auctions In Domestic Currency agreements, in addition to the exchange rate hedging instruments, a 20 billion dollar Forward Foreign Exchange Auctions In Domestic Currency was made in February 2017, when the Mexican peso lost excessive value.

In the eight months after the announcement of the program, the Mexican peso has gained more than 5% against the dollar, becoming the sixth developing country currency. The top five countries, whose local currency appreciates more than 5% against the dollar, are all developing European countries that benefit from the appreciation of the euro.

Foreign exchange interventions in both Mexico and Brazil have been successful in creating a short-term effect on the exchange rate. On the other hand, it shows that foreign exchange interventions do not have an inflation effect in Mexico, but a high inflation effect in Brazil. Different foreign exchange intervention models create different inflationary costs, although their costs are higher in a model that includes different and high frequency interventions. Different models of foreign exchange intervention have higher costs in a model that includes different and high frequency interventions, but they create different inflationary costs. Regardless of the effects of foreign exchange interventions on the exchange rate, it is concluded that it is associated with high inflation rates in Brazil. In other words, the model of foreign exchange interventions adopted by Brazil seems to be associated with naturally higher inflation rates than the Mexican model (Martin and Renato, 2016).

Indeed, the high inflationary costs associated with the Brazilian model seem in part to the interaction between foreign exchange interventions and the interest rate (traditional monetary policy). Especially adopting a model that requires regular interventions makes it difficult to compensate for the increase in exchange rates with increases in interest rates.

Finally, the Central Bank of Indonesia (BI) started to implement the Forward Foreign Exchange Auctions in Domestic Currency agreement on September 28, 2018. Although it is a forward step towards deepening the domestic financial market, it has brought high current account deficit difficulties in the actual implementation of DNDF as Indonesia is among the countries with high current account deficit. In practice, since DNDF will be calculated with IDR instead of calculated with US Dollars, Indonesia's foreign exchange reserves will not be affected. DNDF is also expected to further deepen the local currency market and eventually prevent the exchange rate from rising excessively (Tanuwidjaja, 2018).

6. Conclusion

Unexpected fluctuations in foreign exchange rates cause foreign currency risk by creating a negative effect on the financial status of the enterprises. Exchange rate risk arises when the expected cash inflows in a given currency in a certain period differ from the expected cash outflows.

The main purpose of the transactions related to hedging against the exchange rate risk is to keep the losses that will occur as a result of the reverse price and currency fluctuations that may occur in relation to assets or liabilities to a minimum. Especially internationally operating enterprises make their financial decisions by taking into account the different costs and foreign currency risks of the many foreign currency and funds that can be obtained from various capital markets. In order for companies not to be exposed to exchange rate risk while performing their activities, it is necessary to determine and apply techniques to deal with risk effects.

In this context, as of 20 November 2017, “Forward Foreign Exchange Auctions in Domestic Currency” was implemented by the CBRT in order to increase the depth in foreign exchange markets and reduce the high volatility in Turkish Lira. With this policy tool, which is a new derivative product, it is expected to increase the capacity of the real sector to manage currency risk by facilitating access to a simple, deep and effective product.

As the auctions did not include foreign currency exchange, the auctions were effective in limiting the demand for foreign currency rather than meeting a foreign exchange demand that may occur in the spot foreign exchange market. The fact that institutional firms that have forward foreign exchange payments put forward their demands in times of depreciation in the Turkish lira may lead to an increase in both level and volatility on exchange rates in the spot foreign exchange market. Through these auctions, it was aimed to increase the capacity of the real sector to manage the exchange rate risk, as well as to reduce the short-term volatility in the exchange rates by limiting the corporate foreign exchange demand, which is especially emphasized in the foreign exchange markets during periods of stress.

The balance exchange rate of countries is determined by macroeconomic parameters such as current balance, foreign debt, growth, productivity, real interest rate in the long term. Forward Foreign Exchange Auctions in Domestic Currency transactions will have limited impact on the balance value of domestic currency. The depreciation of the Turkish lira during the periods when the auctions were held by the CBRT resulted from neither interest rates nor insufficient foreign currency liquidity in the market. The main factor of the depreciation of the Turkish lira can be stated as the appreciation of the dollar

on a global scale and in addition to the increase in the Turkish Lira's risk premium.

In this sense, Forward Foreign Exchange Auctions in Domestic Currency transactions were not used as an instrument to add value to the Turkish lira, but as a tool to reduce the need for foreign exchange stocking in case the currency falls in line with the future needs, by enabling companies to see their way ahead. The application has alleviated the buying pressure created by the corporate demand in the spot foreign exchange market and contributed to at least reducing the volatility even if it does not evaluate the Turkish Lira. Although it is not an application that hinders foreign currency demand of the private sector or foreign investors or increases the appeal of the Turkish lira, it is clear that without these auctions, it is likely that the pressure on the exchange rate will increase and the exchange rate will rise to higher levels.

As a result, it is considered that the Forward Foreign Exchange Auctions in Domestic Currency transactions offered by the CBRT have the potential to be an effective tool for the market considering both the bidding amounts and the competitive prices of the auctions. It can be concluded that the auctions in question, which will contribute to the increase of depth in the foreign exchange markets, play a balancing role in the markets.

Notes

[1] The Fisher Effect is an economic theory created by economist Irving Fisher that describes the relationship between inflation and both real and nominal interest rates. The Fisher Effect states that the real interest rate equals the nominal interest rate minus the expected inflation rate (Fisher, 1930).

[2] They use a sample of 424 firm observations from the Compustat Geographic Segment files for 1998.

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