

# Corporate Risk Management in Slovenian Firms

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In today's competitive environment the modern firm increasingly focuses on identifying, measuring and managing various risk exposures. Risk management is interwoven with the firm's business strategy and impacts considerably on its competitive position. Thus, management should develop an integrated approach to address it. Although hedging using derivatives accounts for just one part of such an approach, the article solely covers financial risk management using derivatives. Namely, it is found that even Slovenian blue-chip firms still have room to improve as they have only recently started to use derivatives. The article reviews some of the most interesting characteristics and practices of modern Slovenian financial risk management departments and provides a practically oriented case-study which describes the important steps a risk manager must take to hedge commodity price exposure.

*Key Words:* risk management, derivatives, corporate finance, hedging accounting, reporting, supervision, auditing

*JEL Classification:* G32

## Introduction

Modern corporations increasingly analyse and manage risk. They detail risk management strategies and put substantial efforts into communicating them with various stakeholders. Thus, one can find precise information about internal control mechanisms, critical assessments of crucial assumptions, and a valuation of exposures with the effects of hedge activities. The motivation for so doing is primarily the stronger pressure from owners and the business community as a consequence of debacles like Enron, Worldcom etc., and secondly the regulatory framework represented by the Turnbull Report and Combined Code in the UK, KonTraG

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Gesetz zur Kontrolle und Transparenz im Unternehmensbereich in Germany, the Sarbanes-Oxley Act in the US, and the Corporate Governance Code and Principles of Corporate Treasury in Slovenia. Disclosures and a fair valuation are also required by accounting standards and core corporate legislation.<sup>1</sup> Risk management and appropriate disclosure are the focus of the OECD Principles of Corporate Governance (2004). Besides those, voluntary disclosures that disclose but do not reveal valuable information and thus shield a competitive advantage are recommended by various professionals (Epstein and Rejc Buhovac 2006). Therefore, sound risk management and transparent disclosures are a critical determinant of success in today's competitive environment. It helps acquire additional external capital at a lower cost.

A survey conducted by the risk management consultant Tillinghast-Towers Perrin in 2003 indicated a high increase in awareness and activities of corporate treasurers regarding improved corporate governance requirements (Berk, Peterlin and Ribarič 2005). Besides better management and an adjusted strategic framework, activities are oriented to increasing transparency at all levels. The goal is to achieve a lower probability of the realisation of damaging or dissatisfying states of nature in various fields and, on the other hand, to improve the value-maximising view of a firm (Copeland and Copeland 1999). PwC consultants argue that a holistic approach prevents blindsightedness (PriceWaterhouseCoopers 2004). As a side effect of increasing shareholder wealth, benefits also reach other stakeholders including employees who work in a less turbulent environment and can thus better focus on the core business.

Risk management should not be perceived only as financial risk management. A holistic approach to risk management encompasses operational risk management, strategic risk management, capital budgeting risk management and market risk management (COSO 2002; Berk, Peterlin, and Ribarič 2005). Namely, the modern risk management function has recently become quite interwoven and well spread and thus nowadays requires wide identification and measurement systems. It in fact underpins every business decision and is well rooted in the corporate strategy (Clarke and Varma 1999; Epstein and Rejc Buhovac 2005; PriceWaterhouseCoopers 2004). Despite this, the goal of this article is not to address such a holistic approach but to locate financial risk management which represents ordinary and well accepted tools of a modern enterprise and to point out some shortcomings in establishing practices in Slovenia.

The article is structured as follows – after the introductory theoretical background about risk management, contemporary practices concerning the use of derivatives in Slovenian blue-chips and enterprises with the largest perceived exposures are outlined. Their derivatives practices are compared to the practices of US and German firms, which is interesting since firms in the two compared countries operate in a more developed business environment. At the end, a case study is presented that includes all the cornerstone accounting, valuation, supervision and reporting issues. As such, it should help Slovenian CFOs overcome the shortcomings that are identified.

### **Theoretical Background to Risk Management**

Broadly speaking, authors studying the significance of motives for risk management in non-financial companies can be divided into two categories. The first highlights various aspects of shareholder wealth maximisation, mainly tax savings, avoidance of underinvestment problems and minimisation of costs of financial distress (the shareholder wealth maximisation theory). Those in the other category build their arguments within the classical problem of relations between agents and principals (agency theory) (Tufano 1998).

In the perfect and efficient world of Modigliani and Miller without taxes and transaction costs, there are only rational investors who maximise their wealth in conditions of perfect information (Modigliani and Miller 1958). In such a setting, any risk management activity reduces their wealth. Namely, prices in capital markets are formed only on the basis of a company's systematic risk. Non-systematic risk is eliminated through diversification (Froot, Scharfstein and Stein 1993). Hence, any managerial activity aimed at reducing non-systematic risk (for example, the operating risk of a company) would unnecessarily reduce risk that has already been eliminated by rational investors by means of diversification. The wealth of shareholders is thereby reduced because of the increased costs (Fatemi and Luft 2002).

This is of course an extreme interpretation, valid only under the strict presumptions of the perfect Modigliani-Miller world and even then only for big public joint-stock companies. There are numerous arguments that undermine this breakthrough idea of the respected academics (Bartram 2000). First, the statements are made in an environment of a well-developed capital market, presupposing that all companies are organised as joint-stock companies where all investors optimally and rationally di-

versify their wealth, and invest in joint-stock companies proportionally to how they are represented in the capital market. Second, the authors neglect the existence of interest groups within the company, for example employees, the management team, suppliers, creditors etc. These are exposed to the company in question, which results in them bearing the consequences of the undesirable realisation of events affecting the company, irrespective of how these events reflect on the value of the company as estimated by the capital market. Third, the authors neglect the existence of numerous companies of a smaller size using diverse forms of organisation that do not aim at the objective of maximising the market value of the company but are pursuing different objectives, such as a comfortable lifestyle, a high level of environmental responsibility etc. Fourth, the authors do not consider transaction costs and taxes. The latter in particular play a dominant role in the theory of risk management in non-financial companies. Through event studies of share price reactions to company announcements relative to the extent of risk management within the company, Cassidy, Constand and Corbett (1990) came to the conclusion that these announcements are followed by periods of growth in share prices. In short, risk management is an activity about which a consensus has recently been reached regarding its benefits for investors and other interest groups.

A survey by the RCEF on the use of derivatives (RCEF-IFI 2005; Berk 2006) and a survey on the stage of development of the business-financial function (Berk 2003)<sup>2</sup> found that even the largest and most exposed companies are relatively unsophisticated in terms of risk management. It is therefore to be reasonably expected that their conduct is in accordance with the shareholder wealth maximisation theory, rather than the agency theory stating that managers overwhelmingly hedge exposures as they are more risk-averse than shareholders. Even the largest companies have started to use derivatives relatively late.<sup>3</sup> This means that the use of derivatives on a broader scale, at the level of the national economy, would make business results less unsteady and therefore contribute to avoidance of the underinvestment problem and to the occurrence of costs of financial distress. For consistent and precise (financial) risk management and supervision an integral system needs to be set up and human resources organised, which demands a lot of time. This article is directed at this aim.

Only in the second stage, when financial risk management systems have been established to a larger extent, can one expect the particular

relationships envisaged by agency theory. Due to its current relevance, only shareholder wealth maximisation theory is presented in detail in the following section.

#### MAXIMISING THE WEALTH OF SHAREHOLDERS

According to the shareholder wealth maximisation theory a company will, when management goals equal those of the shareholders, actively manage risk if can be the benefits outweigh the costs. While the latter are obvious and relatively simply measured (they represent direct transaction costs and indirect costs of all activities of risk management or transaction administration), the benefits are not so easy to identify. They originate from tax savings, financial distress cost reduction and/or a larger extent of realised investments with a positive net present value (Nance, Smith and Smithson 1993; Fatemi and Luft 2002).

The tax argument is closely connected to tax regulation and marginal tax rates. If the imposition of taxes on companies is progressive and companies are placed in between the tax brackets, if investments are eligible as tax relief and companies are allowed to transfer profits or losses among years, the benefits of risk management start emerging as companies can plan their tax burden with greater accuracy. The higher the degree of progressiveness (the more the taxation is convex), the more tax relief available to companies and the more possibilities of the transfer of profits or losses, the more companies can save using the tools of risk management (Smith and Stulz 1985). Greater variability of profits certainly leads to higher anticipated tax burdens.<sup>4</sup> The latest empirical studies show that tax effects alone do not justify the costs of active risk management – the motive for active risk management is the benefits arising from the two fields that are dealt with below (Fatemi and Luft 2002).

The benefits of protection from risk further derive from the lower variability of cash flows, which reduces the probability of the occurrence of financial distress in the company and the occurrence of the related costs. The benefits of risk management are a positive function of the probability that the company will experience financial distress and additional costs.<sup>5</sup> Smith and Stulz (1985) are advocates of the theory that emphasises the benefits of reducing the costs of financial distress. Their conclusions exert an influence on the capital structure of a company. Namely, if a company manages to reduce the variability of its business profits or business cash flow through risk management because borrowing costs are reduced,<sup>6</sup> it achieves a more stable coverage of fixed obligations –

times interest earned – and acquires additional borrowing capacities and extra benefits from tax shields. Copeland (2002) states an example of two companies, equal on the whole but with different variable cash flows. In this case, risk management is a substitute for equity. Smith and Stulz (1985) observed that hedging risk is reasonable because it brings a reputation and the possibility of more favourable financial conditions for subsequent borrowings – higher prices or lower borrowing costs. A company further reduces the costs of financial distress by having to comply with the restrictive covenants of contracts. As put by Mello and Parsons (1999), hedging policy is wealth-maximising as it changes the probability of exhausting the firms' cash balances and thus the value of the firm. Thus, a hedging program relieves the firm of a cash-balance constraint. However, Copeland and Copeland (1999) stress that a sole variance reduction is neither a necessary nor a sufficient condition for reducing the probability of business disruption. Other factors such as transaction costs, the coverage ratio defined as the ratio of operating cash inflows and outflows to come to the optimal hedge shall be considered.

Third, the hypothesis of the shareholder wealth maximisation theory attributes risk management benefits to possibilities of avoiding situations where the company does not perform enough projects, which would have positive net present values. Namely, in certain circumstances a company is inclined to an underinvestment problem. The advocates of this theory – Froot, Scharfstein and Stein (1993) – at the same time hold the view that this is the most important reason why companies are actively concerned with risk management. The authors refer to the following typical circumstances in companies which are the basis of their theory – first, companies make or increase the value for shareholders with investments in projects with positive net present values; second, business financing (of new investments) is in accordance with Myers' (1977) pecking-order hypothesis;<sup>7</sup> and, lastly, changes in interest rates (variability), commodity prices and foreign exchange rates have a negative effect on net operating cash flows.

Therefore, if the most important source of capital is not protected the company may not carry out all of its profitable projects with a positive net present value, which in turn means that shareholder wealth will not be increasing optimally or will be diminished. If a company secures a stable net operating cash flow, it will not be forced to abandon profitable projects which will lead to an optimal increase in both the wealth of the company and of the shareholders (Froot, Scharfstein and Stein 1993).

### **The Use of Derivatives: Contemporary Practices**

Derivatives are one of the most important and highly resounding innovations in financial markets to which the breakthrough in the risk management field is linked. Previously, companies had been hedging risk by means of insurance policies (Berk, Peterlin and Ribarič 2005).

There are three basic types of derivatives – of the first generation – futures/forwards, options and swaps. 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 (Jorion 2005).

A forward contract is a contract where a future purchase or sale is agreed with all essential elements of the contract being determined today. Forwards are traded through banks, other agents or directly between customers – the principal-to-principal market. A future contract is a standardised forward contract which is traded on the stock exchange. The main differences from a forward contract are its trading place and the degree to which the underlying asset is standardised. A financial option is the right to buy or sell the underlying asset at a price agreed today. The cost of the option or the premium is subject to a determined or agreed price. An important difference between the option and the other derivatives is the freedom of the holder of the option, who can either on or before the expiry date of the option decide whether or not to exercise their right. This discretion is accorded with the payment of a premium (compensation) that at the same time limits the possible amount of loss of the option contract in question. The premium can be regarded as an insurance premium and its fair value depends on the fair value of the underlying asset at any time before the expiry of the option. Financial swaps are contracts where counterparties agree to swap two underlying assets in future at a rate decided on today. Both counterparties are in a debtor-creditor relationship until the settlement takes place – throughout the duration of the swap the credit position is changing (i. e. the creditor's net credit risk is increasing). The same applies to forwards and futures (Jorion 2005).

Forwards, futures and swaps are 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 (Jorion 2005). A com-

pany 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 (Giddy and Dufey 1995). 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. Researching a sample of US companies, Bodnar and Gebhardt (1998) found that the use of options is increasing with the variability of the cash flows.

The use of derivatives among Slovenian companies is on the rise, although it is still at a low level even among banks for which there is evidence that they are currently mostly focused on credit-risk models (Aver 2003; Aver 2004). A recent survey shows that 40% of banks do not offer derivatives to their customers nor use them for their own risk management (Bajuk 2005).

Among non-financial companies, the percentage of companies that use them is low in comparison with developed environments (Berk 2006); the best known derivatives category are forwards as a means of hedging foreign exchange risk (Doles 2004, 4). Amid the reasons for the modest use of derivatives, Doles (2000) lists the wrong perceptions of derivatives trading and related losses that Slovenian companies had incurred mostly before the year 2000, the poor flexibility of products and IT support regarding Slovenian conditions, the small size of the financial area where even trading in the cash market is relatively restricted, and the lack of knowledge.

Results of the RCEF-IFI survey (2005) allow interesting conclusions in the fields of the policies and characteristics of the use of derivatives. The primary purpose of the survey was to compare the Slovenian practice in financial risk management with the practices of developed environments. The surveys of the practices of US and German non-financial companies by Bodnar and Gebhardt (1998) and Bodnar et al. (1995) can be regarded as referential. US and German market environments are more developed than the Slovenian one and thus represent a reasonable benchmark for Slovenian firms. The authors of the US and German surveys had similar ambitions and the Slovenian survey was structured in the same manner. Before quoting the results, the next section explains the methodology of the survey.



#### METHODOLOGY

The sample of companies which were sent a questionnaire about the use of derivatives by the Research Centre at the Faculty of Economics of the University of Ljubljana (RCEF-IFI) in November 2004 was composed so as to include all companies that were expected to use derivatives to the largest extent. Such companies are those with the highest foreign exchange exposure.<sup>8</sup> The selection was determined by the value of the income originating from foreign markets and the proportion of that income in the total income of the company. The results of the survey do not reflect the situation in the Slovenian economy on the whole as there are probably some companies that are less exposed to financial risk and are not as developed as regards hedging with derivatives, or else they only use them to a smaller extent. Smaller companies have also some knowledge and staff restrictions. Moreover, they do not even realise their financial risk exposure, they have inadequate information support and are organisationally weaker.

The sample included all non-financial companies that had their securities listed on the Ljubljana Stock Exchange on 30 September 2004, the top 80 exporters and the top 80 relative exporters regardless of their main activity (relative export is measured by the proportion of income originating from foreign markets). In total, 257 questionnaires were sent out; 57 complete responses were received, which corresponds to a 22% response rate. Survey questions were constructed following US and German surveys conducted by Bodnar, Hayt, Marston and Smithson (Bodnar et al. 1995), Bodnar and Gebhardt (1998). Slovenian firms are significantly smaller. The size breakdown of firms (measured by total revenues) in all three economies under comparison shows that about 95% of the Slovenian firms are in the size group of up to EUR 0.25 billion, but only about 19% and 10% of US and German firms, respectively, are also in that group. At the upper end, there are just two (3.5% of all respondent firms) represented in size groups of more than EUR 0.5 billion, whereas about 64% of US and 82% of German firms are included in that size group.

#### THE PRACTICES OF DERIVATIVES USAGE IN SLOVENIAN BLUE-CHIP ENTERPRISES AND COMPARISON TO THEIR US AND GERMAN PEERS

US, German and also Slovenian companies most frequently use derivatives to hedge their foreign exchange exposure (see figure 1). The second most used derivatives are related to interest rates, while the least fre-

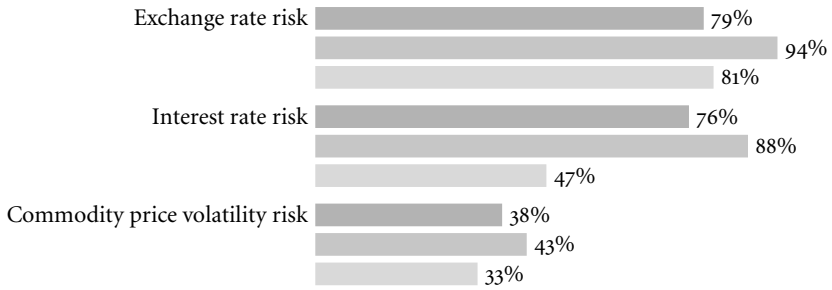


FIGURE 1 Usage of derivatives by different risks (dark gray – USA, gray – Germany, light gray – Slovenia; adapted from Bodnar and Gebhardt 1998; Berk 2006)

quently used are commodity derivatives. Compared to their US peers, a relatively high percentage of Slovenian companies uses derivatives linked to the exchange rate relative to the interest rate and commodity prices (RCEF-IFI 2005; Bodnar and Gebhardt 1998). The use of interest-rate-related derivatives is more modest – only 47.62% of Slovenian companies hedging with derivatives are using them while the percentage among their US peers is 75.90%. The use of derivatives is even higher in German companies, as much for the exchange-rate-related and interest-rate-related as for commodity derivatives.

Bodnar and Gebhardt (1998) claim that a majority of companies simultaneously uses different types of derivatives. This is true especially for German companies – 44.90% of them use derivatives for hedging all three types of financial risk, while 84.70% use a combination of exchange-rate and interest-rate-related derivatives. Among the US companies, there are 26.70% of them using derivatives for all three types of financial risk and 58.80% using a combination of exchange rate and interest-rate-related derivatives. Out of those Slovenian companies which reported the usage of derivatives, there are only 14.30% using them simultaneously to hedge their foreign exchange risk, interest rate risk and commodity price volatility risk. Exchange-rate and interest-rate-related derivatives are used by 35.30% of Slovenian companies (Berk 2006).

A comparison of the use of different types of derivatives shows that the most frequently used derivatives for hedging a foreign exchange exposure are forward contracts, followed by options, swaps and futures. Among Slovenian companies that hedge their foreign exchange exposure with derivatives, most (76%) use forward contracts while the relative importance of options is higher than in Germany. Options, swaps

and futures are much more frequently used by US companies, whereas their German peers more often use the simplest instrument (forward contract). Whereas forward contracts are most appropriate for hedging foreign exchange exposure, swaps are far most frequently used to hedge interest rate exposure. In comparison with their US and Slovenian peers, German companies rely more on forward contracts and OTC options. Also slightly more frequent than in the US case is their use of structured products. Slovenian and US companies use a wider range of derivatives to hedge their exposure to price volatility in the commodity market. Above all, they more frequently state the usage of swaps and options. Both instruments are used by 43% of Slovenian companies and more than half of US companies.<sup>9</sup> German companies mostly use forwards or futures (Bodnar and Gebhardt 1998; Berk 2006).

In the documentation of risk management policy there are no differences among US and German companies. About 80% of companies have their risk management policy documented, the largest companies have a slightly higher percentage figure while the lowest percentage (70%) can be found in the category of the smallest German companies. It was in 1994 that companies started forming their risk management policies quicker and more intensively, when there were huge losses in derivatives trading because companies were using them to speculate and not to hedge their exposures (Bodnar and Gebhardt 1998, 20). Slovenian companies are in this respect lagging behind considerably, as only one-third of the companies participating in the survey responded in the affirmative to the question on the existence of a documented risk management policy (RCEF-IFI 2005). Judging from the results of an analysis of the questionnaire, Slovenian companies are only beginning with their use of derivatives to hedge some types of risk exposure. In this first stage they are gathering knowledge and verifying their appropriateness; in the second stage we can expect with a high probability an increase in both the number and proportion of companies that will be systematically using derivatives to hedge their financial risk.

As Slovenian companies have poor documentation on risk management policy they also lack criteria for their counterparty ratings in derivatives transactions. This holds true for all transactions, regardless of their respective maturity dates.<sup>10</sup> There are a lot of differences between US and German companies on the issue of counterparty ratings in derivatives transactions. German companies have higher requirements than their US peers – this credit protection or conservatism in business

counterparty selection can explain why German companies are then relatively less concerned with the use of derivatives. The responses of Slovenian companies show the (un)importance of counterparty ratings when concluding derivatives contracts. The huge majority of companies do not have a clearly defined orientation in this field, which indicates they are not fully aware of the credit risk linked to it (Bodnar and Gebhardt 1998; RCEF-IFI 2005).

An important element of financial risk management is determining the level of possible influence of financial risk on the business results of a company. One of the financial risk valuation methods available to companies is the value-at-risk approach – *var*. Value at risk is the anticipated loss a company could suffer in a given time period and the given risk degree due to the fluctuation of risk factors in business – non-financial companies most often define their confidence level at 95%. Value at risk is determined on the basis of amounts of resources, debts and capital exposed to different risk factors regarding the historical variability of a given risk factor (Jorion 2005).

The measurement of value at risk for a given type of financial risk reveals a possible negative influence or the importance of particular risk exposure on the business outcome. Value at risk should therefore be measured before any risk management programme, it should determine the possible loss in the case the company does nothing. It is then illustrative to measure the value at risk again after the risk management programme has been carried out. In such a case, with a consideration of the instrument protecting the hedged item, the value at risk should of course be lower. The measurement of value at risk before and after hedging measures determines the accuracy or efficiency of the hedging decision. A company can take decisions about hedging instruments on the basis of such a test.

Slovenian companies did not prove to be very successful concerning the question about their methods of assessing financial risk. The value-at-risk approach is used by only 21% of Slovenian companies, while the figure for their US peers is 56% (Bodnar and Marston 1998).

Slovenian companies also only unsystematically and rarely assess the value of their derivatives. While a quarter of the US companies and almost half of the German ones assess the value of derivatives at least weekly, there is only one-fifth of such companies in Slovenia. Almost one-half only carries out an assessment when necessary or has not determined its frequency (Bodnar and Gebhardt 1998; RCEF-IFI 2005).

### **Case Study – Hedging against Raw Material Price Fluctuation with a Forward Contract**

With this case study we present a practical example of the use of derivatives under a hedging programme.<sup>11</sup> It presents all important elements that a company has to define and the steps that have to be taken to attain its purpose regarding hedging against a certain type of risk. We selected the case of hedging against price fluctuations of the key raw material of a notional company, AluXiX, Inc., which is exposed to two fundamental risk factors due to the nature of its business, namely to raw material price fluctuation risk (aluminium) and exchange rate risk.<sup>12</sup>

The valuation, revaluation and tax treatment of financial instruments depends on the type and intended use and we therefore expose them immediately in the continuation. Further on, it depends on the business and accounting policies how financial instruments will be recognised and derecognised in the company's assets and liabilities. In the hedging process financial instruments are broken down into hedged items and hedging instruments. Likewise, non-financial assets can appear in the hedging relationship, which are hedged against risk factors with financial instruments.

All derivatives are measured at their fair value, while other assets or liabilities of the company can be measured differently. The company's assets and liabilities that are hedged items and appear in hedging relationships have to be measured at their fair value just like hedging instruments. The attainment of the planned profit or loss is also thereby assured, besides the correct selection of the hedging instrument, which is reflected in attainment of the planned cash flow. Determination of the fair value depends on the market as the trading place and on the availability of information on trading (Peterlin 2005).

#### TYPES OF HEDGING RELATIONSHIPS

Three basic types of hedging relationship are defined in the IAS and IFRS – a fair value hedge, a cash flow hedge and a hedge of a net investment in a foreign operation.

A *fair value hedge* is a hedging relationship where a hedged item is already recognised in the company's assets or liabilities, or else there is a firm commitment to conclude an agreement. In this case, the hedged item and the hedging instrument are measured at fair value, and revaluation adjustments are offset in profit or loss. Hedge effectiveness is measured as an offset rate of revaluation adjustments of the hedged item with

revaluation adjustments of the hedging instrument. If the offset is 80% or more, it is considered that the hedge is effective and the company can continue hedge accounting.

A *cash flow hedge* means that the hedged item is not recognised in the company's assets or liabilities, and therefore revaluation adjustments of the hedged item cannot offset revaluation adjustments of the hedging instrument. In this instance, revaluation adjustments of the hedging instrument are recognised in equity, and the hedging relationship is transformed to a fair value hedge upon recognition of the hedged item, and capital revaluation adjustments are transferred to profit or loss, and revaluation adjustments are accounted for in profit or loss until derecognition of the hedging relationship.

A *hedge of a net investment in a foreign operation* presents a hedge of a capital contribution in an associated undertaking against the changes of the fair value of equity due to exchange rate changes.

Each hedging relationship is subject to an assessment of the hedge effectiveness.<sup>13</sup> Effectiveness is very important for the cash flow hedge, as the effectiveness threshold defined in the standard also represents the threshold of special accounting/tax treatment. So long as the hedge is effective, the revaluation adjustments of the hedging instrument can be recognised in equity, but if the hedge is ineffective, revaluation adjustments are recognised in profit or loss and are subject to taxation. The type of hedging relationship determines the recognition of the hedging relationship and we therefore must also determine the criteria for derecognition of the hedging relationship.

The objective of hedge accounting for the hedging relationship is the fair presentation of the company's profit or loss and assets. When derivatives were not subject to accounting, only hedged items (at that time without this definition) were the subject of revaluation, and a hedging instrument could not offset adjustments. Therefore, the influences on the tax base were unfair and accounting statements did not disclose a company's fair value (Peterlin and Glavina 2007).

RULES ON FINANCIAL INSTRUMENT ACCOUNTING  
AND CONTROL OVER THE FAIR VALUE MEASUREMENT  
OF DERIVATIVES

In the Rules on Accounting it is recommended that financial instrument accounting and hedge accounting should be accorded a special chapter. Besides that, we also define the organisational, operational and manage-

rial responsibilities of the finance department team. The company management is responsible for the fair value measurements and disclosures in the accounting statements. In order to fulfil its obligation, it has to: determine the fair value measurement and disclosure procedure; select the corresponding method to estimate (determine) the fair value; form starting assumptions for establishing the fair value and prove them correspondingly with evidence; prepare the fair value estimate, and assure that the fair value measurements and disclosures are in accordance with the accounting standards.

Many measurement methods based on estimates, including the fair price measurement, are inherently imprecise. In the case of fair value measurements, particularly those that do not involve contractual cash flows or for which market information is not available when making the estimate, the estimates often involve uncertainty in both the amount and timing of future cash flows. Fair value measurements may also be based on assumptions about future operating conditions or events whose outcome is uncertain and will therefore be subject to change over time.

Fair value measurements and disclosures underlie the audit which is addressed in ISA 545 and IAPS 1012 (IFAC 2003a; 2003b). This standard provides guidance on audit considerations relating to the measurements, the presentation and disclosure of material assets, liabilities and specific components of equity that are presented or disclosed at fair value in financial statements. The auditor should obtain sufficient appropriate audit evidence that the fair value measurements and disclosures are in accordance with the accounting standards.

The essential disclosures of financial risks and measures for financial risk management are disclosures of exposure to certain types of risk, fair value measurement, risk management policy and hedging measures, and time limits and circumstances connected with financial instruments, and disclosures of accounting policies.

AN EXAMPLE OF A HEDGE AGAINST RAW MATERIAL PRICE  
FLUCTUATION WITH A FORWARD CONTRACT

In August we need 100 tons of aluminium. In May we conclude a contract at market prices with the supplier for the delivery of 100 tons on 20 August. At the same time, we conclude a forward contract with a financial organisation for the purchase of 100 tons of aluminium at 1,615.50 USD/t. In this way we have assured the aluminium price in advance and obliged ourselves to pay USD 161,550 for 100 tons of aluminium in August.

TABLE 1 Calculation of VaR for the period from 20 May 2004 to 20 August 2004

Item	Quantity	Value	USD
1. Nominal value	100	1,605	160,500
2. Daily aluminium price volatility in USD (250 days; i. i. d.)		1.10%	
3. Daily exchange rate volatility EUR/USD (250 days; i. i. d.)		0.67%	
4. Daily aluminium price volatility in EUR (250 days, i. i. d.)		1.44%	
5. Conclusion	20 May 2004		
6. Maturity	20 August 2004		
7. Working days		63	
9. Risk rate	5%	$z = 1.65$	
10. VaR (aluminium in USD)	14.3% HI		23,023
11. VaR (exchange rate EUR/USD)	8.8% HI		14,083
12. VaR (aluminium in EUR)	18.9% HI		30,269

NOTES HI – hedged item.

We decided not to hedge against EUR/USD exchange rate fluctuations.<sup>14</sup>

It must be emphasised that we consciously decided not to hedge against the USD exchange rate, even though it would have been appropriate. Thus, we can distinguish between a non-hedged liability for the purchased aluminium in USD, and a hedged aluminium price. They could both be hedged and the hedged item would have two hedged risk factors. This time we hedged only against an aluminium price fluctuation. The influence of an individual risk factor on the company's cash flow and profit or loss can thereby be shown more clearly.

#### *Activities on 20 May 2004*

First we precisely define the risk factor – and in our case this is the price of aluminium. We first analyse historical aluminium daily price movements from 20 May 2003 to 20 May 2004 in order to estimate its volatility. Aluminium prices are expressed in USD. For this reason we also analyse movements in the EUR/USD exchange rate in the same period.

We only want to hedge against aluminium price fluctuations, but in spite of this we estimate the risk position that arises from the volatility caused by individual risk factors linked with a firm commitment to purchase 100 tons of aluminium (table 1).



Value at Risk (VAR) is the expected loss a company could suffer from the impact of the volatility (fluctuations) of risk factors in operations, calculated with pre-determined probability and in a precisely defined time period based on assets, liabilities and equity, exposed to an individual risk factor, regarding the risk factor volatility. Historic data are used for the calculation and therefore the current market situation and rational expectations have to be considered.

Accounting standards state that a company must prove the asset or liability risk that it would like to classify in the hedging relationship, and VAR is the appropriate tool to achieve this. With this tool we can also verify the correctness of our decision about a hedge as the VAR of the hedging relationship must be significantly lower than the VAR of the hedged item, otherwise we may have doubts about the economic value of such a hedge.

Concluding a forward contract, we prepare an annex to the contract in which we define the hedging relationship. We also prepare a document which proves that the hedging relationship is appropriate for hedge accounting. The document's contents must comprise at least:

- The objectives and the purpose of hedging: Guidelines for financial risk management that the company's top management approved on 15 February 2002 precisely define the hedging objectives and strategy of a firm commitment.
- Definition of the hedging relationship: The form with sequence number 13 is an annex to the contract and contains a definition of the hedging relationship.
- Assessment of hedge effectiveness: It is expected that the hedging relationship will be very effective as the forward contract is concluded for the purchase of the same quantity and same type of raw material as agreed in the transaction that is a hedged item. The fair value of the forward contract upon conclusion of the contract is zero.

In the strategy of financial risk management the company AluXiX, Inc. has defined its methods for measuring hedge effectiveness. On concluding a (prospective) hedging relationship we need to estimate whether the hedge will be effective all the time. In our case it should be, as the nominal amount of the forward contract is equal to the purchase agreed in the contract (100 tons of aluminium), and the day of ending the forward contract is the same as the aluminium delivery date in the purchase contract (20 August). Since we do not prepare accounting statements be-

TABLE 2 Definition of the hedging relationship (Annex to the Contract)

<i>Hedging instrument</i>	
Annex number	13
Name of financial instrument	Commodity forward contract
Description of transaction	Forward purchase of aluminium
Conclusion date	20 May 2004
Maturity date	20 August 2004
Instrument concluded by	Company AB, d. d.
Forwards rate	1,615.50 USD/t
Transaction right	Receipt of 100 tons of aluminium
Liability arising from the transaction	Payment 161,550 USD
<i>Hedged item</i>	
Period of exposure to (hedged) risk	20 May 2004–20 August 2004
Definition of a hedged item	A firm commitment to purchase 100 tons of aluminium
<i>Hedge against risk</i>	Aluminium price fluctuation risk
<i>Hedge type</i>	A fair value hedge of a firm commitment

tween the day the hedging relationship is concluded and the day it ends, we will estimate the hedge effectiveness between them (retrospectively) by comparing the change in the fair value of the firm commitment and the forward contract. We expect to achieve a 100-percent offset. We only consider changes in the fair value of the firm commitment and the forward contract that were caused by aluminium price fluctuations. We do not hedge against the EUR/USD exchange rate risk and the influence of this risk on the value of the firm commitment, and the forward contract is disclosed directly in profit or loss (we do not use hedge accounting).

On 20 May the forward contract is not recognised in the balance sheet as the net fair value of the forward contract right and liability is zero.

#### *Activities on 20 August 2004*

We first analyse the price situation in the market and establish that the aluminium price has considerably increased since the contract was concluded with the supplier.

First we evaluate the change in the value of the firm commitment that appeared in the period under consideration due to the impact of the risk factor that we hedge against (the aluminium price). As the value of the

TABLE 3 Value and change in the fair value of the firm commitment

Date	Value of firm commitment
20 May 2004	EUR 138,741
20 August 2004	EUR 131,416
Difference (exchange rate)	EUR -7,325
20 May 2004	USD 161,550
20 August 2004	USD 172,000
Difference (aluminium price)	USD 10,450
Difference in EUR	EUR 8,501
Net change (total)	EUR 1,176

firm commitment is also exposed to the risk of changes in the EUR/USD exchange rate, we estimate the changes in the fair value of the firm commitment that can be attributed to changes in the exchange rate. This separate valuation of changes in the fair value of the firm commitment is obligatory, as the purchase value of raw material upon recognition (when the firm commitment is made) is adjusted by the amount of accumulated changes in the value of the firm commitment that can be attributed to the risk that we hedge against. The forward contract is measured at fair value. The value of the firm commitment has changed by EUR 7,325 due to changes in the EUR/USD exchange rate. This further means that our liability to the aluminium supplier decreased due to the influence of this factor. In the same period the value of the firm commitment changed by EUR 8,501 due to the aluminium price fluctuation. This means that our liability to the aluminium supplier increased due to the influence of this factor. Aluminium price fluctuations and changes in the EUR/USD exchange rate led to an increase in the value of the firm commitment (liability) by EUR 1,176.

The presented analysis of changes in the value of the firm commitment is also used for estimating changes in the fair value of the forward contract, except that the direction of changes is the opposite. The exchange rate decreased the value of the forward contract, but the aluminium price fluctuation increased it; the net change is the increase in value by EUR 1,176.

In respect of accounting treatment, it is important to bear in mind the following activities and accounting:

- The change in fair value of the firm commitment (EUR 1,176) is

recognised in the balance sheet and correspondingly in profit or loss.

- We received the purchased raw material. The aluminium price on the invoice date is 1,720 USD/t. The transaction is valued at this price and calculated to EUR at the spot rate, which is 1.2293 EUR/USD. This event is the basis for charging the raw material inventory and for disclosing a liability to the supplier.
- We adjust the purchase value of the inventory by the amount of the value adjustment of the firm commitment that can be attributed to the risk of an aluminium price fluctuation. The change in the value of the firm commitment, which can be attributed to the risk of changes in the EUR/USD exchange rate, is recognised in profit or loss.
- We recognise the change in fair value of the forward contract in the balance sheet and correspondingly also in profit or loss.
- We settle the forward contract with the counterparty. From the counterparty (the company AB, Inc.) we receive USD 10,450, which can be converted to EUR 8,501 on the spot market.
- We close the account of the forward contract and transfer the difference between EUR 8,501 and EUR 1,176 EUR to profit or loss. This difference was caused by the change in the EUR/USD exchange rate.
- Then we assess the hedge effectiveness in the period between 20 May and 20 August.
- We record a payment to the supplier (USD 172,000) and present the exchange rate differences from 20 May to 20 August 2004. On 20 August 2004 the EUR/USD exchange rate is 1.2168.

The influence of the net change in the fair value of the firm commitment and the forward contract in respect of aluminium price fluctuations on the profit or loss of the company AluXiX, Inc. is thus zero. The decision not to hedge against the exchange rate risk meant that the fall in the USD value had a direct influence on profit or loss as it was not covered by the hedging relationship – through positive exchange rate differences. The change in the value of the firm commitment that appeared due to the risk impact that we hedged against (the aluminium price) neutralised the increased purchase value of the aluminium raw material, which would impair profit or loss. We achieved the purchase price that we established on 20 May, i. e. 1,615.50 USD/t, which is USD 161,550 or EUR 131,416 on 20

August 2004. The hedging objective has been. Namely, the planned cash flow was realised, regardless of the aluminium price volatility.

### **Conclusion**

Modern firms increasingly analyse and manage risk. They detail risk management strategies and put substantial efforts into communicating them with their various stakeholders. It is nowadays common that firms disclose information about internal control mechanisms, critical assessments of crucial assumptions, the valuation of exposures and perceived as well as accomplished effects of hedge activities. One reason for these increased activities are the corporate debacles seen in the last few years and the strengthened supervision of various stakeholders. The second reason reflects the recently reshaped regulatory framework.

There are two main theories explaining corporate risk management behaviour. The first one is based on the shareholder wealth maximisation premise, whereby managers optimise the tax burden, minimise the cost of financial distress and try to avoid the underinvestment problem. The second one rests on the classical principal-agent relationship between shareholders and managers. According to the identified fact that even Slovenian blue-chip firms have only recently started to use basic instruments to hedge their exposures, one may suspect that the shareholder wealth maximisation theory is more of a reality than the agency theory in Slovenia. Therefore, Slovenian managers are only after some starting years expected to push through less risky projects in order to hedge their own non-diversifiable employment risk.

The use of derivatives among Slovenian firms is gaining in importance, although even banks were recently found to be poorly equipped for such tasks. Reasons for such a moderate scope are: wrong perceptions about derivatives hedging and trading activities, the low level of flexibility of products and insufficient IT support, the small size of the domestic financial market and a lack of knowledge.

Slovenian firms predominantly use derivatives to hedge their foreign exchange exposure which also holds for their US and German peers. The second most frequent is interest rate exposure, and only in third place – and much less often addressed – is commodities exposure. A comparison by type of risk shows that foreign exchange exposure is being dealt with by forward contracts, followed by options and only then by swaps. The far most frequent instruments to hedge interest rate risk are swaps, however. Although very similar in these characteristics, Slovenian firms lag

behind US and German ones in terms of the established and approved procedures and documentation policies. According to this finding, the fact that there are no established rules regarding the rating of a derivative transaction counterparty should not come as a surprise. In addition, Slovenian firms lack frequent financial risk exposure measurement, e. g. *VAR* as the most commonly used measure of exposure is only used rarely and only by some responding firms (21 vs. 56 percent among US firms).

Although the same set of questions was posed in the three surveys which enabled direct comparison of financial risk management practices one should bear in mind some potential shortcomings. Firstly, Slovenian firms are much smaller than their US and German counterparts. According to the impact of fixed costs of a hedging programme they are more restricted from the economic point of view. Secondly, results of the comparison depend heavily on institutional setting, potential different macroeconomic positions and circumstances in financial markets and their closely related markets in times of conducting a survey. Exposures and thus requirements to hedge are by all means dependent on industry characteristics. However, the three surveys do not allow testing for the differences of financial risk management practices among various industries. Testing for those differences would require the inclusion of a much larger number of companies.

To address the use of derivatives from a practical viewpoint and to encourage Slovenian firms to grasp this efficient risk management tool-kit, we presented a specific case study that discussed all cornerstone accounting, and valuation aspects and shed light on the appropriate documentation and supervision issues. Hedging only commodity risk, despite the fact that a commodity is quoted in a foreign currency, is chosen so that the reader can better grasp the notion of the interplay of the two risk drivers in a single transaction. The case study provides a strong incentive to hedge, as real-world numbers show that derivatives (when properly used) can substantially reduce the volatility of a firm's cash flows and profit, which is the primary motivation for engaging in risk management activities.

### Notes

- 1 See Financial Operations of Companies Act (*Zakon o finančnem poslovanju podjetij*), Art. 9, and Companies Act (*Zakon o gospodarskih družbah*), Art. 70.
- 2 The survey was carried out with the co-operation of the Slovenian Insti-

tute of Auditors and the Research Centre at the Faculty of Economics of the University of Ljubljana.

- 3 In 2000, there were only two companies out of twenty-one that had confirmed the use of derivatives had actually started using derivatives (RCEF-IFI 2005); in 2001, there were three companies, five in 2002, three in 2003 and one in 2004.
- 4 In years with high taxable profits a higher marginal tax rate is applied, and a lower one in years with lower profits. If the rates are progressive the variability itself induces the use of too high rates and therefore a higher amount of tax paid. Because of the more than linear growth of the marginal tax rate and the tax, the term convex tax schedule is used.
- 5 The costs are direct (court expenses, legal expenses etc.) and indirect, opportunity costs – the costs of missed opportunities and costs of lost confidence.
- 6 As the company is less risky, its creditors require lower profitability.
- 7 The advocates of this theory argue that internally produced funds – net operating cash flow – are the most important source of capital.
- 8 Because of the difficulty of determining which companies are most exposed to financial risks (thus taking into account the exchange, interest and price volatility of commodities), only exposure to foreign exchange was considered.
- 9 Only seven Slovenian companies responded to the question about the hedging of commodity price volatility risk.
- 10 The question inquired about the lowest ratings of a counterparty (financial institution) with which the company would conclude a derivative contract.
- 11 Accounting treatment is based on IAS 39 (Commission Regulation (EC) No. 1751/2005; Commission Regulation (EC) No. 1864/2005; Commission Regulation (EC) No. 2086/2004; Commission Regulation (EC) No. 2106/2005) and IFRS 7 (Commission Regulation (EC) No. 108/2006).
- 12 This is a Slovenian company which operates in EUR, and the aluminium price in the global market is listed in USD.
- 13 The method for performance measurement has to be stated in the accounting policy and the accounting rules.
- 14 The particularity of the case lies in the separation of risk factors, even though the factors are logically linked. The exclusion of USD, in which aluminium is listed, as the hedged item, means that USD is left to speculation and only the aluminium rate is hedged. In the valuation of a hedged item we distinguish changes in its fair value due to individual risk factors, and in the hedging relationship we include only such risk factors that we decide to hedge or secure.

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