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CORPORATE RISK MANAGEMENT PRACTICES IN CROATIAN COMPANIES

In this paper we present the research results on corporate risk management practices in the large Croatian non-financial companies. The implementation of different risk management strategies and the use of risk management instruments are investigated. Additionally, we have explored which financial institutions and intermediaries are the most important in providing risk management instruments and what are the reasons why Croatian companies do not manage corporate risks or use derivative instruments. The survey has revealed that the majority of analysed companies are using some form of interest-rate, foreign exchange or commodity price risk management and that price risk and foreign exchange risk have the highest influence on the company's performance, while companies are not so affected by interest-rate risk. Regarding the use and importance of different risk management instruments in risk management strategy, survey results have clearly indicated that Croatian non-financial companies stick primarily with simple risk management instruments like natural hedging. In the case of derivatives use, forwards and swaps are by far the most important instruments. The majority of the analysed companies does not have a documented risk management policy and do not measure their risk exposure, while the hedging horizon for financial risk management is typically less than one year. The primary goal

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of hedging is managing volatility of cash flows, but Croatian firms focus also on managing balance sheet and financial ratios. Commercial banks are the primary source for derivatives transactions. The insufficient supply of risk management instruments offered by domestic financial industry, the high costs of establishing and maintaining risk management programs which exceed the benefits of it, as well as difficulties in pricing and valuing derivative instruments are amongst the most important reasons why Croatian companies do not manage corporate risks.

Key words: interest rate risk, commodity price risk, exchange-rate risk, risk management, risk management instruments, large Croatian companies

1. Introduction

Schmit and Roth (1990) have argued that risk management can be described as the performance of activities designed to minimise the negative impact of risk regarding possible losses. Because risk reduction is costly, minimising the negative impact will not necessarily eliminate risk. Rather, management must decide between alternative methods to balance risk and cost, and the alternative chosen will depend upon the organisation's risk characteristics. It might be helpful to arrive at agreement on just what the function of risk management is in a corporation. The most important function of risk management is transferring to someone else a risk that the company is unwilling or unable to assume itself. Sometimes, it also involves buying a service that another can perform for the company, better or cheaper than the company can itself (Smith, 1964). In this paper we present the research results on corporate risk management practices¹ in the large Croatian non-financial companies. The implementation of different risk management strategies and the use of risk management instruments are investigated. This evidence is important for evaluating the overall risk characteristics of firms that use different hedging instruments, which is of interest to bankers, investors, the monetary authorities, and to scholars as well. We have explored how many companies manage financial risks, whether they manage all three types of financial risks and what kind of risk management instruments they use. We also asked financial managers about the intensity of influence of financial risks on the performance of their companies. Managers were questioned about the firm's hedging horizon, the corporate risk management goals and the use of VaR or Monte Carlo analysis or some other type of simulation techniques as measures of the firm's risk exposure.

¹ In this paper, financial risks are equated with the corporate risks, and the analysis includes interest-rate risk, exchange-rate risk and commodity price risk.

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2. Theoretical Framework

Financial risks - the risks to a corporation stemming from price fluctuations - are pervasive, and directly or indirectly influence the value of a company. Financial risk management can be conducted in two different ways. Either the firm can engage in activities which together result in less volatility than they would exhibit individually, or the firm can engage in financial transactions that will have a similar effect. The first approach is the application of diversification strategy in the portfolio of businesses operated by the firm, while the second is the firm's purchase of derivative instruments. Diversification is corporate risk management strategy that was promoted in the management literature for a long time. Corporate diversification is often justified on the grounds that it reduces risk, or volatility in rates of return, by reducing a firm's exposure to the cyclicity of any single industry. The theoretical rationale for this concept is borrowed from the modern portfolio theory (Markowitz, 1952).

However, diversification based upon conglomerate activity, while once a popular strategy, has fallen out of favour. During the 1950s and 1960s many corporations undertook massive diversification programs. In a few decades the trend has reversed, with a study by Comment and Jarrell (1995) documenting and confirming a return to specialisation. This push toward focus apparently resulted from the view that unrelated diversification actually decreases firm value. Theoretical arguments suggest that diversification has both value-enhancing and value-reducing effects. The potential benefits of operating different lines of business within one firm include greater operating efficiency, less incentive to forego positive net present value projects, greater debt capacity and lower taxes (see: Weston, 1970; Stulz, 1990; Lewellen, 1971). However, the potential costs of diversification include the use of increased resources to undertake value-decreasing investments, cross-subsidies that allow poor segments to drain resources from the better-performing segments, and misalignment of incentives between central and divisional managers (see: Myerson, 1982; Harris, Kriebel and Raviv, 1982; Stulz, 1990; Jensen's, 1986; 1988; Meyer, Milgrom and Roberts, 1992; Berger and Ofek, 1995).

The above papers have not distinguished between related and unrelated diversification. In this context, Lubatkin and Chatterjee's (1994) findings make the difference. Instead of a linear relationship, they have found a curvilinear relation-

ship, suggesting that there is an optimal level of diversification for firms. It appears that risk, however measured, is best minimised by some midrange level of diversification, such as a constrained strategy, in which opportunities to share tangible and intangible assets are numerous. Lubatkin and Chatterjee's (1994) findings are therefore contrary to the popular portfolio theory. Firms that diversify in a constrained manner are able to realise synergies that other diversification types can not achieve, and these synergies help to protect the firm from macroeconomic uncertainties. Their results have important implications and suggest that diversifying into new markets only for the purpose of hedging may actually increase corporate risks. It could be concluded that it is better for corporate managers to focus their attention on building competitive advantages in each market in which they participate, and that can be accomplished through a constrained diversification strategy.

Operational hedging is a way to conduct a multinational diversification strategy, which provides a reason for direct foreign investments by firms, and may further explain the existence of multinational firms with production facilities at several foreign locations. An example of an operational hedging policy would be to locate production in a country where significant sales revenues in the local currency are expected. Multinational corporations often sell products in various countries with prices denominated in corresponding local currencies. The effect of unexpected changes in exchange rates and foreign demand conditions on domestic currency value of sales revenues are hedged by similar changes in the domestic currency value of local production costs (Chowdhry and Howe, 1998).

In the place of diversification strategy, firms, concerned about the volatility of earnings, have turned to the financial markets, due to the fact that the financial markets have developed more direct approaches to risk management that transcend the need to directly invest in activities that reduce volatility. The task of managing corporate risks has been facilitated by the increasing availability of a variety of instruments to transfer financial price risks to other parties. Allen and Santomero (1998) have written that, during the 1980s and 1990s, commercial and investment banks have introduced a broad selection of new products designed to help corporate managers in handling financial risks. At the same time, the derivatives exchanges, which successfully introduced interest rate and currency derivatives in the 1970s, have become vigorous innovators, continually adding new products, refining existing ones, and finding new ways to increase liquidity. Markets for derivative instruments such as forwards and futures, swaps and options, and innovative combinations of these basic financial instruments, have developed and grown at a breathtaking pace, and many corporations have become active participants in derivatives markets. Since then, the range and quality of both exchange-traded and OTC derivatives, together with the depth of the market for such instruments, are intensively expanding. The emergence of the modern and innovative deriva-

tive markets allowed corporations to insulate themselves from financial risks, or to modify them. Using derivatives, a corporation is increasingly able to determine the environment in which it will operate, and to create for itself a private “derivative reality,” a synthetic world released from risks that a corporation considers undesirable (Hu, 1995; 1996). Therefore, under these new conditions, shareholders and stakeholders increasingly expect management to be able to identify and manage exposures to corporate risks.

Instead of managing risk through hedging, firms could pursue alternative activities that substitute for financial risk management strategies. Although they are not considered as a special kind of risk management strategy, it should be noted that the literature has argued that alternative financial policies, usually referred to as “hedge substitutes”, can also reduce a firm’s risk without requiring the firm to directly engage in risk management activities. Firms could adopt conservative financial policies such as maintaining low leverage, a low dividend pay-out ratio, or carrying large cash balances to protect them against potential financial difficulties (a form of negative leverage). Greater use of these substitute risk management activities should be associated with less financial risk management activities. Thus, a firm with a relatively conservative capital structure and dividend policy is “hedging” against adverse business conditions since any future earnings shortfall can be compensated more easily by, for example, drawing down cash available from a large cash balance (Froot, Scharfstein and Stein, 1993; Nance, Smith and Smithson, 1993). A question should be raised regarding the management choice to select such a conservative capital structure. If the reasoning behind their decision lies in the inability to predict financial prices trends, they should reconsider their decision. What they have done is use low leverage instead of different kinds of hedging instruments to protect against the risk in those economic variables. It should be emphasised that reducing the debt-equity ratio can be unattractive because it also reduces debt-related tax shields and increases the firm’s tax liability. An alternative management strategy would be to take on more debt and then hedge those risks directly, for example, in the derivatives markets.

Structured debt, also referred to as hybrid debt (e.g. putable or convertible bonds), can be seen as another example of “hedge substitutes” (see: Nance, Smith and Smithson, 1993; Smith and Stulz, 1985). A firm that issues structured debt can achieve the identical market exposure by issuing debt and entering into a derivatives contract. For example, commodity-linked bonds typically contain embedded long-dated forwards or options on commodity prices that are not available on organised exchanges (Smithson and Chew, 1992). Another potential benefit of managing price risks with structured debt is that it avoids the corporate costs associated with the use of derivatives like the costs of building expertise in derivatives markets, the costs of managing the counterparty credit risk, the costs of managing the funding and operational risks associated with all derivatives (e.g. see: Culp,

1994). In addition to the structured debt, the firm could use preferred stock rather than straight debt (Nance, Smith and Smithson, 1993; Smith and Stulz, 1985). Preferred stock reduces the probability of financial distress as firms can omit a preferred dividend payment without being forced into bankruptcy. In contrast, bankruptcy filing is virtually inevitable if an interest payment on debt is not met.

Risk exposure refers to the extent to which external environmental contingencies affect a company's performance (Miller, 1998). There are several ways companies can measure their risk exposure. Many financial institutions quantify the probability of lower-tail outcomes by using a very popular and well known-measure called Value at Risk (VaR) (e.g. see: Dowd, 1999; 2000). The biggest advantage of VaR is its ability to compress the expected distribution of bad outcomes into a single number. Regardless of its advantages, VaR is not an adequate measure in the case of non-financial companies and cannot be used as an effective tool for corporate risk management. VaR is a measure calculated for a short period and it tells the maximum extent of a company's losses in 95 cases out of 100 (VaR evaluated at the 5 per cent level of significance) in a given day, or in a given month. VaR does not give useful information when management's concern is whether firm value will fall below some critical value over an extended period of time.

An alternative to VaR is future cash flow simulation in order to estimate the default probabilities of a company. The most practical approach to assessing a company's probability of financial distress is to conduct a sensitivity analysis on the expected distribution of cash flows. Using Monte Carlo simulations, a company's cash flows can be projected over a ten-year horizon in a way that reflects the combined effect of, as well as interaction between, all the firm's major risk exposures on its default probability. To do this properly, the financial manager must specify a range of likely future economic scenarios and how the firm's cash flows will be affected by these developments. The probability of distress over the period would be measured by the fraction of simulated distributions that falls below a certain threshold level of cumulated cash flow. Such a technique could also be used to estimate the expected effect of various hedging strategies on the probability of distress. One of the advantages of using simulation techniques in this context is their ability to incorporate any special properties of the cash flow that are not normal. The VaR approach assumes that the gains and losses from risky positions are not dependent. This assumption is not likely to be real when it is applied to operational cash flows of a non-financial company. There is a high probability that the poor cash realised flow today will negatively affect cash flow tomorrow. Simulation techniques have an ability to anticipate and build the interdependence of cash flows in the probability analysis that a company will face financial distress (Stulz, 1996).

3. Data Collection and Methodology

Empirical research was conducted on the largest Croatian non-financial companies because these companies are exposed to corporate risks to a greater extent than small and medium sized companies. Financial firms were excluded from the sample because most of them are also market makers, hence their motivation in using risk management instruments (e.g. derivatives) may be different from the motivations of non-financial firms. Companies needed to meet two out of three conditions required by the Croatian Accounting Law² that relate to large companies to be selected in the sample - 1) a value of total assets higher than 108 million kuna, (2) income in the last 12 months higher than 216 million kuna, and/or (3) annual number of employees higher than 250. List of the largest 400 Croatian companies, published by Privredni vjesnik (*in English: Business Herald*), for the year 2005 has been used and 157 companies that have met the required criteria were selected in the sample.

The greatest challenge of this research was to find an appropriate data set, because the analysed companies have not been very public about their risk management activities. Data were collected from two sources: from annual reports and notes to the financial statements for the fiscal year 2005, and through our survey. We relied more on the survey data than on the annual reports for several reasons. *Firstly*, we wanted to explore perceptions of financial or risk managers regarding the risk management policies and strategies in their companies. Also, we wanted to find out what are the reasons why companies that classified themselves as non-hedgers do not manage risks. These data we could not find in the annual reports. *Secondly*, a part of the data that we have used as explanatory variables was not reported in the annual reports, therefore we needed to find them by using different sources. The last and the most important reason for relying on survey data was that not all of the analysed Croatian companies were obliged to report risk management activities in notes to the financial statements. This obligation refers only to those companies that are listed on the stock-exchange, while many companies in our sample are not public joint-stock companies. Therefore, annual reports could not be the only data source in the case of our research and we needed to rely on a survey.

A survey questionnaire was addressed to the firm's chief financial officer or, if there was no such position, to the financial controller or the treasurer, and was mailed at the beginning of September 2006. The implicit assumption was that these are the persons most likely to have the relevant information. The questionnaire has covered three broad areas; foreign exchange rate risk management, in-

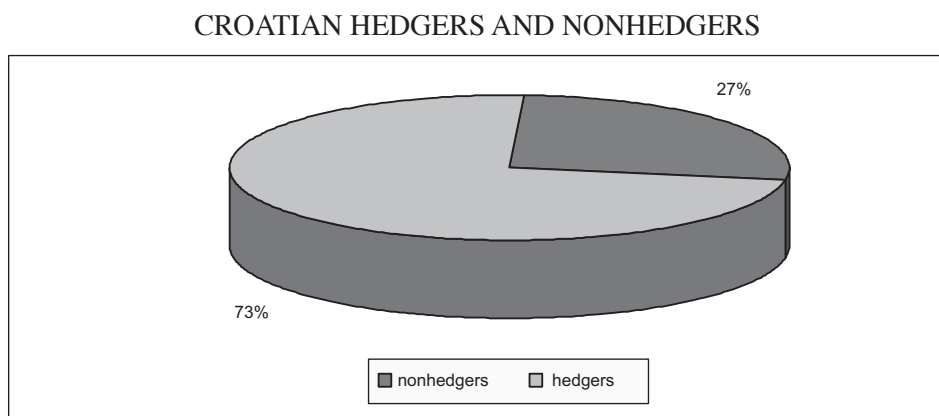
² In Croatian: Zakon o računovodstvu, *Narodne novine* 146/05

terest rate risk management and commodity price risk management. Additionally, a part of the questionnaire referred to those companies that classified themselves as non-hedgers in order to search for reasons not to manage financial risks. It should be emphasised that the problem with a survey is that the person who fills in the questionnaire out does not necessarily have the relevant information or the motivation to provide careful and truthful answers. Moreover, questions are not always interpreted correctly. We tried to gauge accuracy in different ways. First, we wanted to make sure that the people who completed the questionnaire had the information we were interested in. This is why the questionnaire was sent to the chief financial officer or to the controller and the treasurer of the firm. Then we asked firms to tell us who actually filled out the questionnaire. In the vast majority of the cases (more than 90 per cent), the answering person was the CFO, the treasurer or the controller. Unless people who complete the questionnaire are dishonest or careless, we should therefore have received accurate information.

In order to encourage willingness to participate, the respondents were promised a copy of the summarised results. Only 19 companies answered by the end of September, so a follow-up letter was sent to the non-respondents. Sending a follow-up letter encouraged a response rate from 12 to 31 per cent. An adequate response rate is the problem that has been often raised in research based on a survey. We believe that the accomplished response rate is satisfactory for statistical generalisation (e.g. the response rate of the 1998 Wharton survey of derivative usage, as reported in Bodnar, Hayt and Marston (1998) is 21 per cent). However, it is important to mention that the inability to compare the survey results to the data of non-responding companies should be treated as a limitation of this research.

4. Research results

A survey has revealed that 73.5 per cent of respondents are using some form of financial risks hedging to manage interest-rate, foreign exchange, or commodity price risk, while 26.5 per cent of them do not manage financial risks at all.

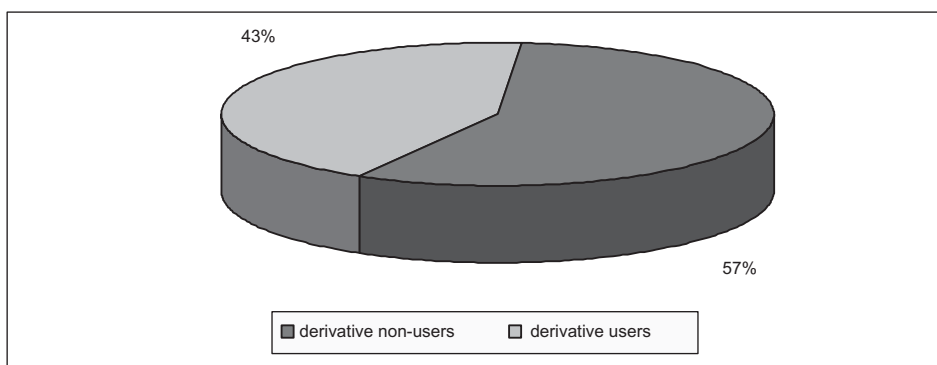
Graph 1.

Source: Croatian survey data

Additionally, we have expanded our analysis to companies that use or do not use derivatives as risk management instruments. Thus, among companies that manage financial risks, there is a substantial number of hedgers who do not use derivatives, but manage risk exposure with some other instruments like natural hedge, operational hedging, hedge substitutes, etc. It can be seen that even 41 per cent of companies that declare themselves as hedgers manage corporate risks, but do not use derivatives as a risk management instrument. In other words, 43 per cent of the responding Croatian companies use derivative instruments for managing corporate risks, while 57 per cent use other less sophisticated risk management instruments or do not manage corporate risks at all (see graph 2).

Graph 2.

DERIVATIVE USERS AND NONUSERS AMONG CROATIAN COMPANIES



Source: Croatian survey data

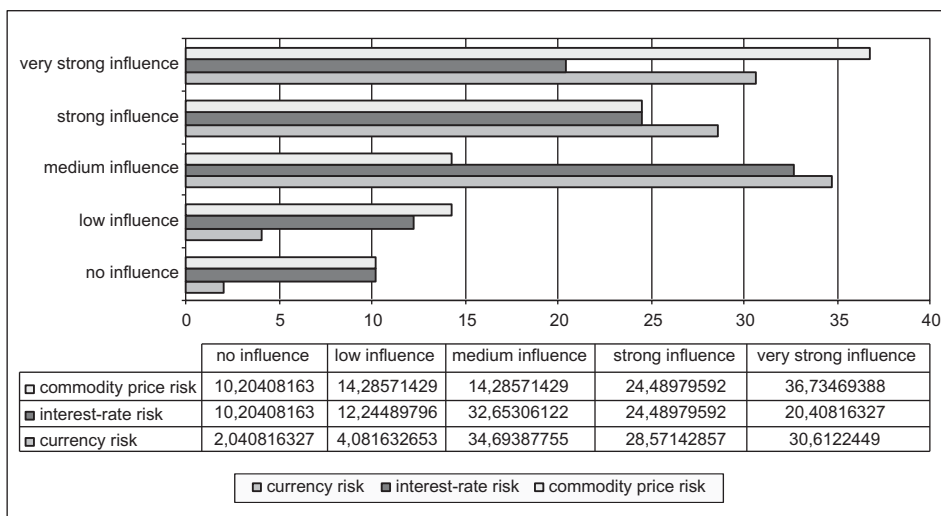
Interesting evidence is revealed through the correlation analysis. Correlation analysis was conducted by calculating Pearson's correlation coefficient as it is the most common measure of linear correlation when variables are of interval/ratio nature (Bryman and Cramer, 1997). We have found that companies that are hedgers or derivative users have managers that finished educational programmes in risk management ($p=0.002$; Pearson's $\rho = 0.425$ for derivative users, $p=0.001$; Pearson's $\rho = 0.473$ for hedgers). Additionally, there is positive correlation between decision to hedge corporate risks and level of manager's formal education ($p=0.038$; Pearson's $\rho = 0.297$). On the basis of these results it can be concluded that formal education like Master's or PhD degree, or education in risk management influence corporate level of hedging. We have also found positive relation between decision to hedge and share of the company owned by foreign investors ($p=0.029$; Pearson's $\rho = 0.312$) which points out that foreign ownership of a company plays an important role in the decision to hedge risks. This result could be explained by the fact that investing companies which have headquarters in various countries (major investors in the Croatian business sector are companies from Austria, Germany, Italy, etc.), have enforced employment of corporate risk management in the acquired Croatian companies.

In the survey questionnaire we asked financial managers about the intensity of influence of all three types of financial risks on the performance of their companies. Results showed that the price risk and currency risk have the highest

influence - 61.2 per cent of financial managers claim that price risk has a strong or very strong influence on the company performance, while 59.2 per cent of them think the same for currency risk. These numbers are followed by 44.9 per cent of managers who claim that the influence of interest-rate risk is strong or very strong. On the basis of their answers, both hedgers and nonhedgers, it could be concluded that Croatian companies are highly exposed to all three types of financial risk. We believe that these findings could be explained by the fact that Croatia is small and relatively open economy, which results in the great exposure of companies to financial risks, especially to foreign exchange risk and commodity price risk due to the high dependence of the Croatian economy on international trade, especially on import activity. Exposure to the interest-rate risk is a result of external financing through borrowing activity, what is confirmed by the correlation analysis that has shown positive relation between the intensity of interest rate risk influence on the performance of the company and long term debt-to-assets ratio ($p=0.001$; Pearson's $\rho = 0.448$). Miloš (2005) has argued that the majority of Croatian companies are highly dependent on bank loans as the most important instrument of external corporate financing, while raising capital through debt securities is very rare among Croatian companies. However, our results have shown that the long-term debt-to-assets ratio as a measure of corporate indebtedness ranges from 0 to 72.5 per cent, while the mean value for Croatian companies is 21.7 per cent. Graham and Campbell (2001) have argued that companies are highly leveraged if the debt-to-assets ratio exceeds 30 per cent, therefore it could be concluded that Croatian companies in the sample are not highly leveraged, which may explain why interest-rate risk has been ranged as less important in comparison with currency and commodity price risks.

Graph 3.

FINANCIAL RISKS INFLUENCE ON THE CROATIAN COMPANIES' PERFORMANCE



Source: Croatian survey data

Regarding the use and importance of different risk management instruments in risk management strategy, we have presented results in tables 1, 2 and 3. It could be concluded that the currency structure match of assets and liabilities is the most important instrument in managing currency risk. In respect to the use of derivatives, the currency forward is the most important and frequently used instrument, followed by currency swap as the second most important derivative instrument. Other derivatives such as currency futures, stock-exchange and OTC options, and structured derivatives are not frequently used by Croatian companies. As well, hybrid securities and operational hedging are not important currency risk management instruments.

Table 1.

**CURRENCY RISK MANAGEMENT INSTRUMENTS
USED BY CROATIAN COMPANIES**

Instrument	Per cent of companies that use the instrument	Importance 1-3 (frequencies of companies that use the instrument)		
		1 = less important	2 = important	3 = very important
1. Matching currency structure of assets and liabilities (e.g. debt in foreign currency)	61	1	14	15
2. Currency forward	30.6	3	5	7
3. Currency futures	4.1		2	
4. Currency swap	10.2	2	1	2
5. Stock-Exchange Currency option	0			
6. OTC (over-the-counter) currency option	4.1	2		
7. Structured derivatives (e.g. currency swaption)	0			
8. Hybrid securities (e.g. convertible bonds or preferred stocks)	2.0		1	
9. Operational hedging (International diversification – moving part of the business abroad)	6.1	1	2	
10. Other instruments - avoidance of operations in volatile currencies	2.0		1	

Source: Croatian survey data

Interest rate risk in Croatian companies is hedged most frequently by matching maturity of assets and liabilities (a form of natural hedging). Again, forward contract and swap are the most important derivative instruments in risk management strategy, but in contrast to currency risk management, interest rate swap is more important than interest rate forward and is used by 16.3 per cent of companies that declare themselves as hedgers. Similarly to currency risk management, other derivative instruments do not play an important role in managing interest rate risk, but hybrid securities that are considered as substitutes for hedging have gained importance in comparison with currency risk management.

Table 2.

INTEREST-RATE RISK MANAGEMENT INSTRUMENTS USED BY CROATIAN COMPANIES

Instrument	Per cent of companies that use the instrument	Importance 1-3 (frequencies of companies that use the instrument)		
		1 = less important	2 = important	3 = very important
1. Matching maturity of assets and liabilities	53.1	1	8	17
2. Interest rate forward	8.2	1	2	1
3. Interest rate futures	0			
4. Interest rate swap	16.3	5	3	8
5. Stock-Exchange interest rate option	2.0		1	
6. OTC (over-the-counter) interest rate option	0			
7. Structured derivatives (e.g. cap, floor, collar, corridor or swaption)	2.0	1		
8. Hybrid securities (e.g. convertible bonds or preferred stocks)	6.1	2	1	
9. Other instruments – combining debt with fixed and fluctuating interest-rates	2.0		1	

Source: Croatian survey data

There is a lower frequency of commodity risk management amongst Croatian companies. Price risk management is usually hedged naturally by managing assets and liabilities. Among derivatives instruments the commodity forward is the most important, but not as popular as the currency forward. For the first time, futures contracts are used as representatives of standardised derivative instruments traded on the financial market. Contrary to the findings presented while analysing currency and interest-rate risk, the commodity swap has not been used at all, and the same is true of other derivative instruments. Business diversification through mergers, acquisitions, and other business combinations is quite important in managing price risk and has been used by 16.3 per cent of the analysed Croatian companies.

Table 3.

**COMMODITY PRICE RISK MANAGEMENT INSTRUMENTS
USED BY CROATIAN COMPANIES**

Instrument	Per cent of companies that use the instrument	Importance 1-3 (frequencies of companies that use the instrument)		
		1 = less important	2 = important	3 = very important
1. Managing assets and liabilities	55.1	1	6	20
2. Commodity forward	8.2		2	2
3. Commodity futures	4.1		1	1
4. Commodity swap	0			
5. Stock-Exchange commodity option	0			
6. OTC (over-the-counter) commodity option	0			
7. Structured derivatives (combination of swaps, future contracts and options)	0			
8. Business diversification through mergers, acquisitions, and other business combinations	16.3	2	2	4
9. Other instruments – like market diversification or long term contracts with suppliers where prices of goods are fixed	6.1	1	1	1

Source: Croatian survey data

The results of the survey clearly indicate that Croatian non-financial companies stick primarily with simple risk management instruments like natural hedging. Where derivatives are used, forwards and swaps as representatives of over-the-counter plain-vanilla instruments are by far the most important vehicles of corporate risk management. These findings are consistent to Bodnar *et.al.* (1995), Jesswein (1995), Bodnar, Hayt and Marston (1998), Bodnar and Gebhardt (1998) as well as to Bodnar, Jong and Macrae (2003). They have found that, among the various risk management instruments, a forward contract remains the hedging vehicle of choice, and the popularity of forward contracts has not been threatened by the introduction of more sophisticated instruments. The next group of more popular products is swaps and over-the-counter options. Though falling in the same category, the exchange-traded products have substantially smaller percent-

ages of adoption. The greater use of over-the-counter products is probably attributable to their flexibility and convenience as they are custom-made and are likely to fit better to the specific needs of a company. Use of “exotic, third-generation” products like structured derivatives is quite limited. Although the innovations of the third generation have received much attention in the academic literature, their adoption is less common as it would be expected. The likely explanation is that most of companies’ business needs are already well covered by the more common plain-vanilla products.

Correlation analysis has shown that the share of a company owned by management, as well as company’s size and indebtedness influence the decision which risk management instrument to use. The analysis has revealed positive relation between the value of equity owned by management and use of currency swap ($p=0.004$; Pearsons $\rho = 0.478$), interest rate swap ($p=0.007$; Pearsons $\rho = 0.487$) and commodity forward ($p=0.025$; Pearsons $\rho = 0.424$), while there is negative relation between the value of equity owned by management and use of maturity match of assets and liabilities ($p=0.002$; Pearsons $\rho = -0.541$) as well as natural hedge or netting ($p=0.013$; Pearsons $\rho = -0.463$). These results lead to conclusion that managers who are also the owners of company stocks use more sophisticated risk management instruments like derivatives, while those who do not have stock ownership stick primarily with natural hedging.

Similar results have been proven in the case of the company’s size measured by the value of total assets and total sales revenues. Positive relation between the value of total assets and use of interest rate forward ($p=0.000$; Pearsons $\rho = 0.623$) and total sales revenues and use of interest rate forward ($p=0.000$; Pearsons $\rho = 0.627$) exists. Also there is positive relation between the value of total assets and use of interest rate swap ($p=0.024$; Pearsons $\rho = 0.419$) and total sales revenues and use of interest rate swap ($p=0.033$; Pearsons $\rho = 0.397$), while negative relation exist between the value of total assets and use of natural hedging as risk management instrument ($p=0.044$; Pearsons $\rho = -0.384$) and total sales revenues and use of natural hedging as risk management instrument ($p=0.026$; Pearsons $\rho = -0.420$). Regarding the impact of company’s indebtedness to the choice of risk management instruments, there is negative relation between leverage debt-to-assets ratio and use of maturity match of assets and liabilities as risk management instrument ($p=0.021$; Pearsons $\rho = -0.427$) and long term debt-to-assets ratio and use of maturity match of assets and liabilities as risk management instrument ($p=0.036$; Pearsons $\rho = -0.391$). Additionally, analysis has shown positive relation between long term debt-to-assets ratio and use of currency swap ($p=0.007$; Pearsons $\rho = 0.457$) and interest rate swap ($p=0.003$; Pearsons $\rho = 0.538$), as well as positive relation between interest cover ratio and use of interest rate forward ($p=0.005$; Pearsons $\rho = 0.523$). It can be concluded that bigger companies that are more leveraged use swaps and interest rate forwards as risk

management instruments to a greater extent, while smaller companies that are not highly indebted use less sophisticated risk management instruments like natural hedging.

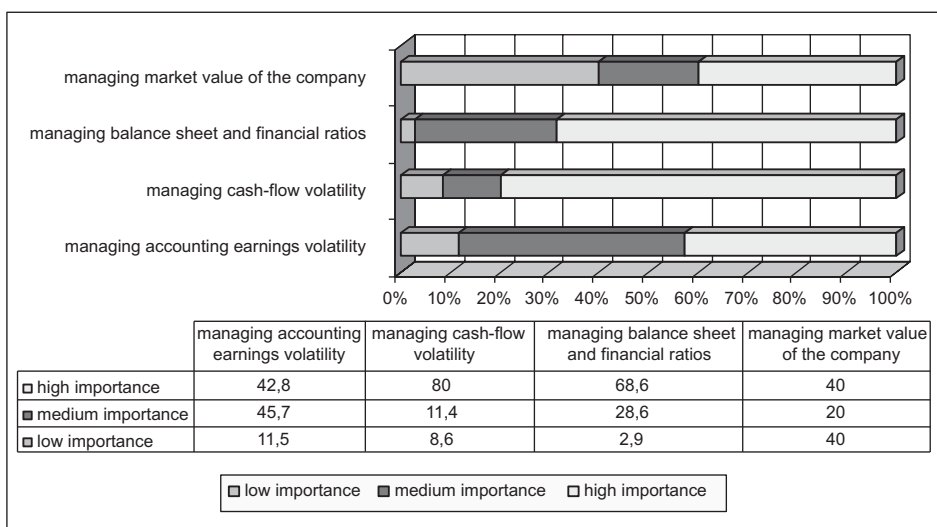
Our results are consistent to the findings of previous studies. Campbell and Kracaw (1987), Bessembinder (1991), Nance, Smith and Smithson (1993), Dolde (1995), Mian (1996), as well as Getzy, Minton and Schrand (1997) and Haushalter (2000) have found empirical evidence that firms whose capital structures are highly leveraged hedge more by using derivatives. The probability of the firm encountering financial distress is directly related to the size of the firm's fixed claims relative to the value of its assets. By reducing the variance of a firm's cash flows or accounting profits, hedging decreases the probability, and thus the expected costs, of financial distress (see: Mayers and Smith, 1982; Myers, 1984; Stulz, 1984; Smith and Stulz, 1985; Shapiro and Titman, 1998). The argument of reducing the costs of financial distress implies that the benefits of derivatives use should be greater the larger the fraction of fixed claims in the firm's capital structure. Also, results of empirical studies like Nance, Smith and Smithson (1993), Dolde (1995), Mian (1996), Getzy, Minton and Schrand (1997) and Haushalter (2000) have proven that larger firms are more likely to use derivatives. The assumption underlying this rationale is that there are substantial economies of scale or economically significant costs related to derivatives use. For forwards, futures, options, and swaps, this cost consists of out-of-pocket costs such as brokerage fees and the implicit cost of the bid-ask spreads. Then, there are agency costs that such activities bring, which include the costs of the internal control systems to run the hedging program. These include the problems associated with the opportunities for speculation that participation in derivative markets allows (Allen and Santomero, 1998).

Regarding other survey results, only 36 per cent of the companies that manage financial risks have a documented policy regarding the use of financial risk management instruments, while the majority of hedgers manage risks without an official policy. Additionally, only 8.3 per cent of hedgers use Value-at-Risk as a measure of risk exposure, while 11.1 per cent of them use Monte Carlo analysis or some other type of simulation techniques as measures of risk exposure. The survey has revealed that 71 per cent of analysed companies manage risk for transaction with maturity up to a year's time. Therefore, it could be concluded that the hedging horizon for financial risk management is typically less than one year. An important issue in corporate risk management is defining its goals. The theoretical financial literature strongly recommends focusing on cash flows or on the value of the company. A focus on accounting numbers is generally discarded (Bodnar and Gebhardt, 1998). However, the results of the Croatian survey have shown that the primary goal of hedging is managing volatility of cash flows, but that Croatian firms focus also on managing balance sheet and financial ratios. Some

80 per cent of respondents indicate that their key motive behind financial hedging is to decrease the volatility of cash flows; however, stabilising balance sheet and financial ratios is a close second (68.6 per cent respectively). Only 40 per cent of them claim that the market value of the company is the primary goal of corporate risk management. It should be emphasised that there is a strong link between the Croatian financial accounting and tax accounting. As a result of those institutional features, we believe that there is a strong focus on accounting earnings in all business decisions and consequently also in hedging decisions.

Graph 4.

CORPORATE RISK MANAGEMENT GOALS IN CROATIAN COMPANIES

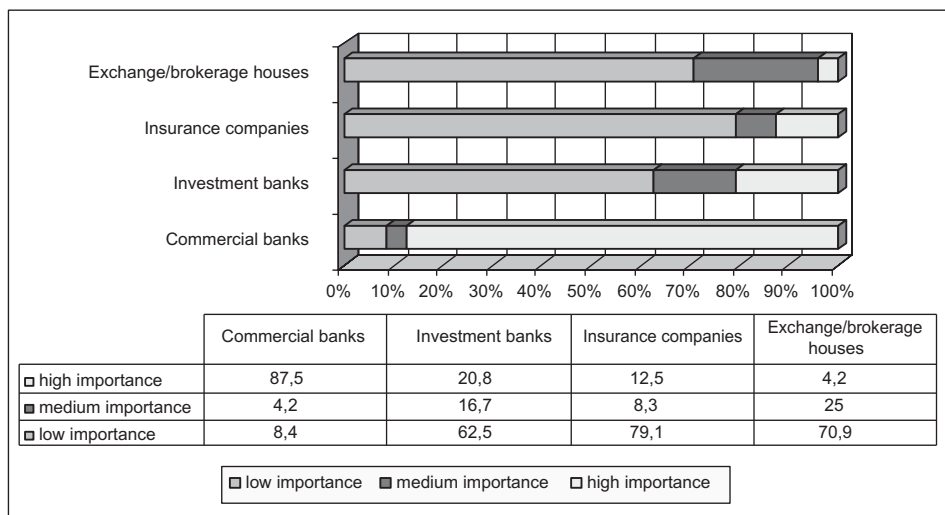


Source: Croatian survey data

Commercial banks are by far the primary source for derivatives transactions for 87.5 per cent of Croatian hedgers. Investment banks, insurance companies and exchange/brokerage houses are not a very important source for derivative transaction, and very few Croatian firms use them as counterparties.

Graph 5.

IMPORTANCE OF DIFFERENT COUNTERPARTIES IN PROVIDING RISK MANAGEMENT INSTRUMENTS



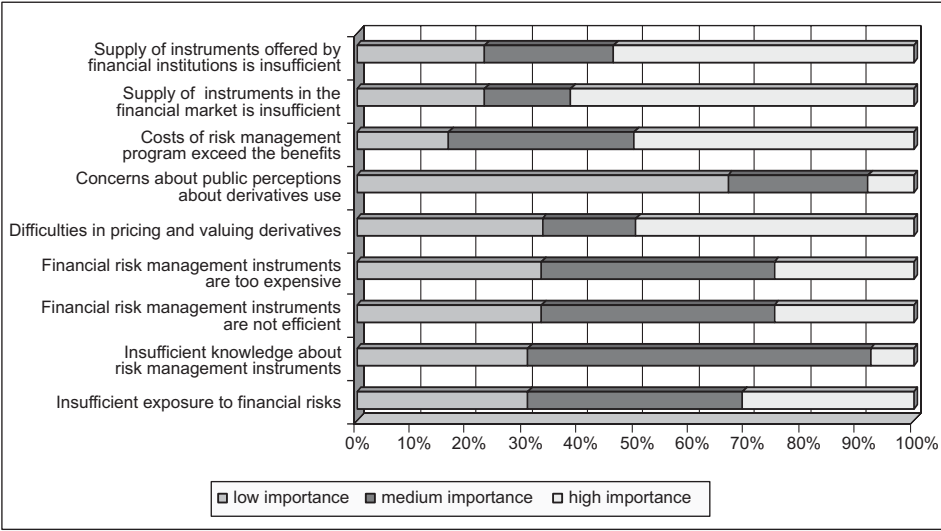
Source: Croatian survey data

The most important reasons why companies do not use derivatives as risk management instruments, judged by financial managers' opinion, are as follows. Some 53.9 per cent of managers argued that the supply of risk management instruments offered by Croatian financial industry is insufficient. Very important reasons that have influenced decision not to hedge financial risks are the costs of establishing and maintaining risk management programmes that exceed the benefits of it, as well as difficulties in pricing and valuing derivatives (50 per cent of financial managers numbered these two reasons as very important). Other reasons like concerns about perceptions of derivatives use by investors, regulators and the public, insufficient exposure to financial risks, insufficient knowledge about financial risk management instruments, and inefficiency and high costs of risk management instruments are not very important reasons why companies in Croatia do not hedge. On the basis of the respondents answers and informal interviews conducted at the 3rd Annual Conference of the Croatian Association of Corporate Treasurers held in September 2006, it could be concluded that, despite the fact that there is an increasing number of non-financial companies which are

aware of the importance of corporate risk management, a lack of suitable instruments offered to them by domestic financial industry becomes a leading factor why many companies do not use derivatives when managing risks. This problem has the strongest impact on the shipbuilding industry. Anecdotal evidence collected through contacts with managers in a few Croatian shipbuilding companies has revealed that they are highly exposed to foreign exchange risk due to the sales revenues being denominated in the US dollars, while operating cost are in the Croatian national currency. Unfortunately, providers of currency risk management instruments (mainly commercial banks) are not able or willing to offer them adequate instruments which would protect their cash-flows from the currency risk that emerges from their specific economic position.

Graph 6.

REASONS WHY CROATIAN COMPANIES
DO NOT USE DERIVATIVE INSTRUMENTS



Source: Croatian survey data

5. Conclusion

Corporate risk management can be conducted in two rather distinct ways - either the company can embark upon a diversification strategy in the portfolio of businesses operated by the firm, or the company can engage in financial transactions that will have a similar effect. Additionally, firms could pursue alternative activities that substitute for financial risk management strategies like conservative financial policies or use of hybrid securities (structured debt or preferred stock). The Croatian survey has revealed that 73.5 per cent of respondents are using some form of interest-rate, foreign exchange or commodity price risk management, while 43 per cent use derivatives among other instruments of corporate risk management. Survey results have shown that price risk and foreign exchange risk have the highest influence on the company's performance, while companies are not so affected by interest-rate risk. We believe that these findings could be explained by the fact that Croatia is very small and relatively open economy, which results in great exposure of companies to financial risks, especially to the foreign exchange risk and commodity price risk due to the high dependence of the Croatian economy on international trade, especially on import activity. Also, Croatian companies in the sample are not highly leveraged, which may explain why interest-rate risk has been ranged as less important in comparison with currency and commodity price risks.

Regarding the use and importance of different risk management instruments in risk management strategy, survey results have clearly indicated that Croatian non-financial companies stick primarily with simple risk management instruments like natural hedging. In the case of derivatives use, forwards and swaps are by far the most important instruments. The majority of the analysed companies do not have a documented risk management policy and do not use Value-at-Risk, Monte Carlo analysis or some other type of simulation techniques as measures of risk exposure, while the hedging horizon for financial risk management is typically less than one year. The primary goal of hedging is managing volatility of cash flows, but Croatian firms focus also on managing balance sheet and financial ratios. Commercial banks are so far the primary source for derivatives transactions.

Interesting evidence is revealed through the correlation analysis. It has been proven that managers of companies who have Master's or PhD degree, as well as education in risk management manage corporate risks more likely. Ownership of the company by foreign investors also plays important role in managing risks as Croatian companies acquired by foreign companies manage corporate risks to a greater extent than companies owned by domestic investors. Correlation analysis has shown that the share of company owned by management, as well as company's size and indebtedness influence a decision which risk management instru-

ment to use. The analysis has revealed that managers who are also the owners of company stocks use more sophisticated risk management instruments like derivatives, while those who do not have stock ownership stick primarily with natural hedging. Additionally, bigger companies that are more leveraged use derivatives as risk management instruments to a greater extent, while smaller companies that are not highly indebted use less sophisticated risk management instruments like natural hedging.

Amongst the most important reasons why companies do not manage corporate risks, financial managers have addressed the following problems: the insufficient supply of risk management instruments offered by domestic financial industry, the high costs of establishing and maintaining risk management programs which exceed the benefits of it, as well as difficulties in pricing and valuing derivative instruments. On the basis of the respondents' answers and informal interviews conducted at the 3rd Annual Conference of the Croatian Association of Corporate Treasurers held in September 2006, it could be concluded that, in spite of the fact that there is an increasing number of non-financial companies which are aware of corporate risk management importance, a lack of suitable instruments offered to them becomes a leading factor why many companies do not use derivatives when managing risks. Therefore, the communication between the suppliers and buyers of the risk management instruments should be improved as it is obvious that supply and demand are not well balanced. In general, it would be useful to provide a high quality education to people involved in risk management decisions and to formalise and better conceptualise risk management programmes at the corporate level. Additionally, Croatia will develop markets for derivative instruments and increase the range of financial risk management instruments after it becomes the member of the European Union. A further growth and development of derivative markets will have an impact to the decrease of the transaction costs related to the use of derivative instruments what should make these instruments more available and feasible to a broader class of companies in different industries. All the factors mentioned above should enhance risk management practices in the Croatian companies and allow better protection of the companies' cash flow from the adverse fluctuation of financial prices.

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PRAKSE UPRAVLJANJA KORPORACIJSKIM RIZICIMA U HRVATSKIM PODUZEĆIMA

Sažetak

U ovome su radu prikazani rezultati istraživanja o praksi upravljanja korporacijskim (financijskim) rizicima u velikim hrvatskim nefinancijskim poduzećima. Istražena je primjena različitih strategija upravljanja rizicima te korištenje različitih instrumenata. Dodatno, istraženo je koje su financijske institucije najvažniji poslovni partneri u ponudi instrumenata zaštite od rizika, a dio istraživanja posvećen je analizi razloga zašto određeni broj analiziranih poduzeća ne upravlja korporacijskim rizicima. Istraživanje je pokazalo da većina analiziranih poduzeća koristi neki oblik upravljanja kamatnim, valutnim ili cjenovnim rizikom te da su poduzeća u Hrvatskoj prvenstveno izložena valutnom i cjenovnom riziku. Hrvatska poduzeća primarno koriste jednostavne metode upravljanja rizicima poput prirodnog hedginga. U slučaju korištenja izvedenih vrijednosnih papira, najviše se koriste unaprijednice i zamjene. Većina analiziranih poduzeća nema službenu politiku upravljanja rizicima te ne mjeri svoju izloženost pojedinim vrstama korporacijskih rizika, a horizont upravljanja je u pravilu kraći od godine dana. Osnovni cilj upravljanja rizicima je upravljanje volatilnošću novčanih tokova poduzeća, no hrvatska se poduzeća također fokusiraju i na upravljanje bilancom i financijskim pokazateljima. Banke su najvažniji poslovni partneri poduzećima pri nabavci instrumenata zaštite od rizika. Među najvažnijim razlozima zašto hrvatska poduzeća ne upravlja rizicima su nezadovoljavajuća ponuda instrumenata zaštite od rizika koje nudi domaća financijska industrija, visoki troškovi uspostave i održavanja programa upravljanja rizicima te poteškoće u vrednovanju i poslovanju s izvedenim vrijednosnim papirima.

Ključne riječi: kamatni rizik, cjenovni rizik, valutni rizik, upravljanje rizicima, instrumenti upravljanja rizicima, velika hrvatska poduzeća