

# DEPARTEMENT BEDRIJFSECONOMIE

## A SURVEY INTO THE USE OF DERIVATIVES BY LARGE NON-FINANCIAL FIRMS OPERATING IN BELGIUM

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WORKING PAPER  
98-263  
April 1998

D/1998/2263/3

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*A survey into the use of derivatives by large non-financial firms  
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**Abstract**

Empirical evidence on the use of derivatives for risk management on the European continent is virtually non-existent. To fill this gap, our survey documents the usage of derivatives by non-financial large firms operating in Belgium. Since we are interested in the end users of derivative products we have excluded financial firms. This paper gives an overview of several questions that are raised in the literature. Which financial risks are being managed? How widespread is the use of derivatives? Which derivatives are used for which purposes? How is a risk management policy implemented? How are performance measurement and reporting structured? ...

**Keywords:** derivatives, risk management, hedging

**JEL classification:** G20, G28, M40

**Acknowledgement:** The authors would like to thank A. Jalilvand for making available the questionnaire he used. Furthermore we would like to thank L. Freyne (Treasurer of Janssen International), W. Possemiers (Treasurer of Pauwels n.v.) and F. Smulders (Treasurer of Agfa Gevaert) for helping us with the pre-testing of the questionnaire. We also benefited from suggestions made by J. Annaert and E. Gysbrechts. The usual disclaimer applies. We would like to thank the University of Antwerp's - Special Research Fund for financial support.

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## *1. Introduction*

Today all firms face various types of financial risk in exercising their daily activities. Coping with financial risk by moving operations back and forth across national borders is not a tractable and financially feasible solution. The rise of derivative markets have made it possible to cope with financial risks in a cost-effective way by shifting them to economic agents who are willing to bear these risks. Hence, with the advent of derivatives, firms have a whole set of (additional) instruments at their disposal to manage these risks and to reduce their overall exposure<sup>1</sup>. As to the reasons why firms should or should not hedge, the discussion is still going on. Géczy, Minton and Schrand (1997) and Nance, Smith and Smithson (1993) argue that the traditional arguments (Smith and Stulz, 1985) to motivate hedging (such as managerial share ownership, the expected costs of financial distress or concavity in firm value due to convexity in tax liabilities) are necessary but by no means sufficient conditions. Capital market imperfections are necessary to justify hedging but the presence of a sufficiently large risk exposure and the costs of implementing also affect the company's decision on the use of derivatives.

Although the theoretical literature provides a number of valid reasons why firms should consider hedging in order to maximize shareholder value, the actual use of derivatives by non-financial firms is not well documented. Dolde (1993), Phillips (1995) and the Wharton School (Bodnar, et. al. 1995, 1996) took the initiative to provide empirical evidence for the US. Dolde (1993), who only examines Fortune 500 firms, finds that large companies still differ greatly in the scope and the sophistication of their approaches to risk management. Size and a view on the market direction by the treasurer are found to be candidate explanatory variables. Furthermore, Dolde (1993) conjectures that risk management is associated with stock market return performance and that on the organizational level most firms centralise risk management but fail to integrate it with the strategic plan. In their report of the 1994 survey Bodnar, Hyat, Marston and Smithson (1995) conclude that the use of derivatives is not yet widespread - particularly for smaller firms- and that derivatives are not commonly used to "speculate" on market movements.

Concentrating primarily on samples of large multinational firms, studies on other countries typically find a widespread use of derivative products. Grant and Marshall (1997) studied the UK, Jalilvand and Tang (1996) examined Canadian practices and Price Waterhouse (1995) surveyed a sample comprising firms of 16 nationalities. Vietze (1997) also prepared a world-wide survey on derivatives for the IASC. He restricted his attention primarily to accounting questions.

Up till now, evidence on the use of derivatives for risk management on the European continent has been very scarce. To fill this gap, our survey documents the derivative usage by non-financial large firms operating in Belgium. Since we are interested in the end users of derivative products we have excluded financial firms. Our study aims at giving an overview of several questions that are raised in the literature. Which financial risks are being managed? How widespread is the use of derivatives? Which derivatives are used for which purposes? How is a risk management policy implemented? How are performance measurement and reporting structured? ...

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<sup>1</sup> At the same time, derivatives also provide increased opportunities for risk-taking. This is the case when firms take speculative positions in derivatives independent of underlying risk exposures.

Belgium offers an interesting case since the Belgian government has provided a legal structure, viz. Co-ordination Centres (abbreviated further as CCs)<sup>2</sup>, in which treasury operations can be performed in a very tax-friendly (almost tax-free) environment. The huge tax-advantages have attracted several multinational firms. Although all the firms in our sample are operating in Belgium, we will be able to distinguish between several types of users according to the location of their headquarters and the use of a CC as a separate treasury vehicle.

The paper is organised as follows. In section 2 we will describe the data selection procedure and we will characterise our population and our sample with a number of descriptive statistics. Special attention will be paid to the biases obtained due to the sample construction. Section 3 will discuss which risks firms use derivatives for. Section 4 tackles the question which derivatives are used for which risks. The fifth section concentrates on the internal organization of the risk management program. It also focuses on performance measurement, reporting and control. The final section contains our conclusions.

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<sup>2</sup> Co-ordination centres are eloquently described by Belgian law as any company having legal personality, created under one of the forms provided in the title IX of book 1 of the Belgian Commercial Code, as well as any Belgian branch of a foreign company having legal personality, subject to the condition that the Belgian company or the foreign company is part of a group and that the CC only exercises one or more of the activities specified by law. The CC must have for its sole object the development and centralisation of one or several activities enumerated hereafter and exercised for the sole benefit of all or some of the companies of the group: advertising, supplying information, insurance and reinsurance, scientific research, relations with national and international government authorities, centralisation of accounting and administrative activities and data processing, centralisation of financial operations and the hedging of risks resulting from fluctuations in foreign exchange as well as all activities having a preparatory or auxiliary character for the companies of the group.

In order to be recognised as co-ordination centre a number of conditions must be satisfied :

- 1° be part of a group which has a multinational character, a capital account and reserves which together amount at least to one billion francs and an annual turnover totalling at least ten billion francs;
- 2° employ the equivalent of at least ten full-time employees in Belgium at the end of the two-year period which starts with the beginning of its activities;
- 3° be recognised by the King ;
- 4° not issue loans evidenced by bonds or notes with a maturity greater than one year, other than under one of the exceptions provided by the Royal Decree for the issuing of bonds in foreign currencies and issues outside of Belgium, and only to the extent assurances are given that the bonds will not be sold, directly or indirectly, to persons or legal entities subject to the personal income tax or the income tax on legal entities;
- 5° not hold stock or otherwise participate in the capital of any company or enterprise.

The taxable income of the CC is determined as a fraction of the expenses and costs of operations, excluding personnel costs and financial expenses. To this strongly reduced taxable basis the ordinary corporate tax rate is applied.

## *2. Data selection, response biases and descriptive statistics*

In June 1997 a detailed questionnaire<sup>3</sup> on the corporate use of derivatives for risk management, very similar to the one used by Jalilvand (1996), was mailed to 334 large corporations operating in Belgium. This population consisted of the 211 CCs and the 123 largest firms<sup>4</sup> ranked by the turnover<sup>5</sup> realised in 1995. The CCs were included in our mailing list since they offer a very tax-friendly environment for risk management as outlined in section 1. Since some large corporations do not use a CC as treasury vehicle, we expanded our mailing with a second list of large turnover firms. Both lists of addresses were obtained from the Trends Top 30 000 CD-ROM (1997), a yearly publication by the Belgian business magazine Trends. Notice that in both sub-samples firms can have their headquarters (HQ) in Belgium or abroad. Indeed, CCs can be founded in Belgium irrespective of the nationality of the parent company. The Trends Top 30 000 consists of all firms, parent companies or subsidiaries, that are located in Belgium.

We obtained a global response rate<sup>6</sup> of 21.9 %, which is in line with the response rates<sup>7</sup> reported by Phillips (18.9%), Vietze (19%), Wharton (26.4% and 17%), Grant and Marshall (36.4% and 22%) and Jalilvand and Tang (27.1%). In 84 % of the responses the questionnaire was answered by the treasurer or by the CFO. 4 % of the respondents were controllers and the remaining 12 % did not specify their function. We did note, however, that the response rate for the CCs was approximately 5 % higher than the response rate for the companies without a CC (23.7% vs 18.7%). This will bias our results somewhat in favour of derivative use since smaller firms that intend to hedge have incentives to structure their treasury operations within a CC.

Hakkarainen, Kasanen and Puttonen (1997) are virtually the only ones who touch upon the question of the representativeness of their sample but they do not formally address the question of response biases. To check for a response bias we had to obtain relevant characteristics that were observable for our total population. Since many financial characteristics are not comparable between CCs and the Top 200 firms, we examined both groups separately. For both sub-samples, we chose two characteristics that could represent size and successfulness. For the CCs we took the number of employees and the return on equity. For the Top 200 firms, the sales and the return on equity were selected. For both sub-samples these characteristics prove virtually uncorrelated (resp. -3.9 % and -0.04 %). Especially size can serve as a proxy for the use of derivatives given the previous findings of e.g. Dolde (1993), Bodnar et. al. (1995) and Phillips (1995) (see also section 3). Note that for the CCs, we are here using the annual reports of the CCs themselves and not those of the parent companies to which the CCs are linked.

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<sup>3</sup> A copy of the questionnaire can be obtained from the corresponding author.

<sup>4</sup> We started with the 200 largest firms but had to exclude 77 firms that were already in our sample because they have a CC. The 200 largest firms have an average turnover of 26.2 billion BEF.

<sup>5</sup> Turnover was also used by Hakkarainen, Kasanen and Puttonen (1997) and Jalilvand and Tang (1996) as a selection criterion.

<sup>6</sup> The answers were received within a period of two months. 20 firms only filled in the questionnaire after a reminder by phone.

<sup>7</sup> A notable exception is Hakkarainen, Kasanen and Puttonen (1997), who obtained a response rate of over 80 % for their sample of the 100 largest Finnish companies.

Table 1: Testing for response bias

## Panel A: Size

	TOP 200 firms (Turnover in billions BEF)		CCs (Number of Employees)	
	Respondents	Non-respondents	Respondents	Non-respondents
NOBS	46	154	48	161
25 <sup>th</sup>	11.13	9.88	14	14
Median	22.50	14.00	19.5	21
75 <sup>th</sup>	44.43	23.62	33.75	33.5
<i>Tests</i>				
MW-Z	-2.736 (0.006)		-0.018 (0.986)	
KSII-Z	2.013 (0.001)		0.489 (0.971)	

## Panel B: Return on equity

	TOP 200 firms		CCs	
	Respondents	Non-respondents	Respondents	Non-respondents
NOBS	46	154	48	161
25 <sup>th</sup>	2.54	0.87	5.08	4.85
Median	8.65	8.56	6.78	7.05
75 <sup>th</sup>	16.81	20.41	8.50	10.12
<i>Tests</i>				
MW-Z	-0.287 (0.774)		-0.566 (0.572)	
KSII-Z	0.721 (0.676)		0.821 (0.510)	

Note: NOBS stands for the number of observations used. The numbers in parentheses are p-values. This table is based on the annual accounts of the TOP 200 firms and on the annual accounts of 209 CCs. Of two CCs no annual account was found. Several firms are in both groups since they are TOP 200 firms having a CC.

Table 1 shows that the distributions of size and return on equity are both for the respondents and the non-respondents right skewed. The medians of the two groups are always very close to each other except for the size of the TOP 200 firms. The median size of the respondents is almost one third larger than that of its counterpart. Formally, the Mann-Whitney test statistics confirm the statistical significance of this finding. A look at the 25th and 75th quartiles also reveals very similar patterns between respondents and non-respondents. The Kolmogorov-Smirnov two-sample test in turn confirms the rejection of the null hypothesis with respect to the size of the TOP 200 firms but in all other cases the null hypothesis cannot be rejected. This we interpret, cautiously, as an indication that there are no further systematic discrepancies between the mailed population and our sample.

It seems fair to conclude that our sample is quite representative of the mailed population except for two biases in favour of the use of derivatives: CCs are responding more than TOP 200 firms without a CC and our sample consists out of somewhat larger TOP 200 firms. These latter firms can also be expected to use more derivatives.

Table 2 presents an indication of the size of the firms in our total sample. For this table we used the financial statements of the TOP 200 companies and the financial statements of the companies that the CCs are linked to. In Table 2 the median turnover (12.1 Billion BEF) is lower than the median turnover for the TOP 200 respondents (22.5 Billion BEF) in Table 1. This is not surprising since the parent companies of CCs of which the parent company did not belong to the TOP 200 are now also included our total sample.

*Table 2: Average size of the firms in our total sample*

<i>Nobs = 73</i>	<i>Minimum</i>	<i>Mean</i>	<i>Median</i>	<i>Maximum</i>
Balance sheet total	0.41	31.3	11.0	377.1
Turnover	0.46	25.8	12.1	290.6
Number of Employees	6	2612	724	41891

Balance sheet total and turnover in billion BEF. NOBS denotes the number of observations.

Whatever size measure we employ, however, we are dealing with large companies even by international standards. This makes our results comparable to those of Bodnar et al. (1995), Grant and Marshall (1997), among others. From the 73 firms in our sample, 67% are listed on an exchange. Since the exchanges differ quite a lot and some firms have multiple listings, it is rather difficult to link our sample to stock market performance.

### *3. The use of derivatives: where do we stand?*

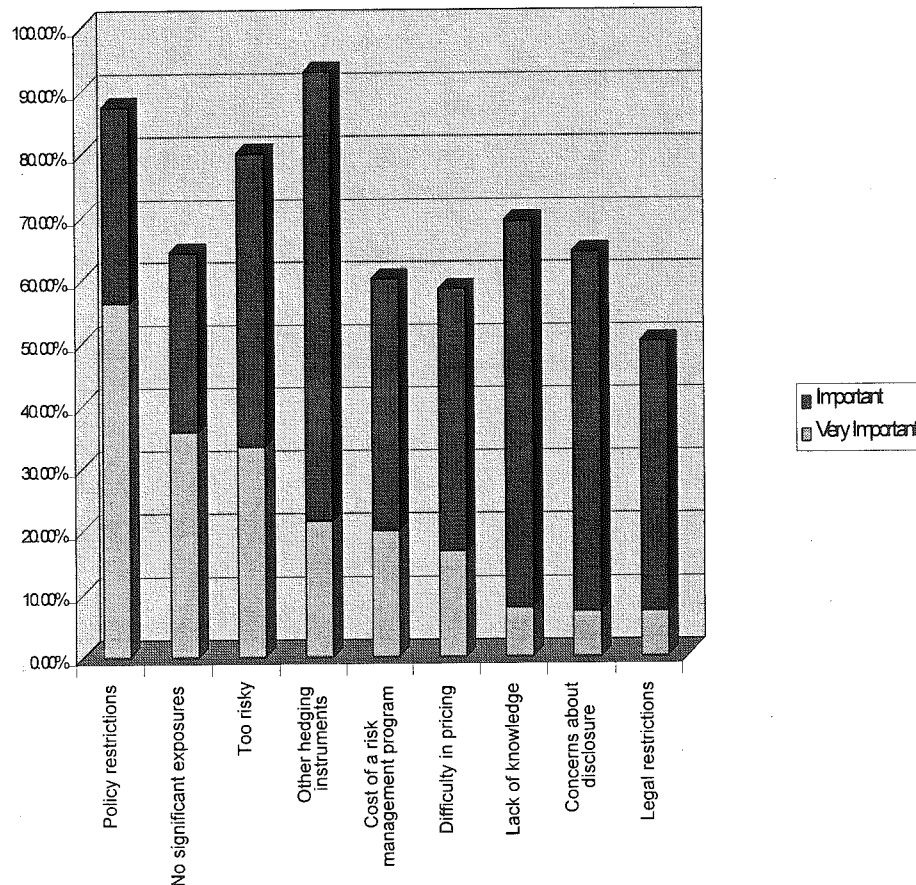
Bodnar et al. (1995) reported 35 % derivative users in their full sample. For the large firms (market value > 250 million USD), however, they found a user percentage of 65 %. Grant and Marshall (1997) even report over 80 % users within the FTSE250 firms. They do recognise that they have a smaller sample than the US studies and that the US studies contain smaller firms that are not likely to use derivatives. Grant and Marshall (1997) did not examine whether the larger or the smaller of the FTSE250 firms responded. In our study, 48 firms of the 73 respondents (i.e. 65.8 %) reported that they used derivatives. 16 firms had never used derivatives and 9 had stopped using them.

As to the reasons why these firms do not use derivatives, we asked them to classify several potential reasons as very important, important or not important. Figure 1 highlights the high importance of policy restrictions imposed upon the treasurers by the board of directors. More than 50 % of the non-users considers this reason as very important. If we also take the firms into account that labelled this issue as important, we end up with 90 % of the non-users. Other often-cited reasons are the risk of the products, the insignificance of the exposures and the existence of other hedging alternatives.

Lack of knowledge, pricing difficulties and concerns about disclosure as well as about the cost of setting up a risk management program are also mentioned frequently. Tax implications are not considered important nor is the perception that the market or the shareholders would have of a derivatives using firm. All the negative news spread around after the great derivative debacles does, according to the non-user respondents, not seem to shed a negative image on firms that are still using derivatives.

When they were asked about their intentions of using derivatives in the future, only one fifth of the non-users said that they were willing to consider derivatives for hedging purposes in the future. Suppliers of derivatives clearly face an important educating task towards top management to lift the corporate policy restrictions if they want to unlock this market potential.

Figure 1: Reasons for not hedging with derivatives



With respect to the use of derivatives, Table 3 confirms our intuition that hedging is one of the services 78 % of the CCs provide. Virtually all CCs with Belgian headquarters use derivatives. In 35 % of the CCs of firms with non-Belgian HQ, no hedging activities with derivatives are performed. Although the number of large firms without a CC is only a small proportion of our sample, it is fair to conclude that they use derivatives much less frequently. The large number of non-users of non-Belgian HQ/non-CC firms can be explained because these are mainly subsidiaries of multinational firms for which hedging activities are performed at HQ level.



Table 3: The use of derivatives of firms operating in Belgium

	Headquarters in Belgium			Headquarters not in Belgium		
	Users	Non users	Total	Users	Non users	Total
CCs	22 (92 %)	2 (8 %)	24	17 (65 %)	9 (35 %)	26
Non CCs	5 (50 %)	5 (50 %)	10	4(31 %)	9 (69 %)	13

The numbers in the table indicate the number of firms from our total sample (73) belonging to each sub-group. In parentheses, percentages are calculated per row for firms with HQ respectively in Belgium and abroad. The 39 firms with HQ outside Belgium, come from the US (14), the Netherlands (7), Germany (4), the UK (3), France (3), Japan (3), Sweden (2), Italy (1), Finland (1) and Switzerland (1).

In many academic studies size plays an important role as explanatory variable. With respect to hedging, the role of size is not unambiguously clear. On the one hand, it is conjectured that large companies will use more derivatives as there are large fixed costs to manage a risk management program (Dolde, 1993). The risk exposures of large firms suit the standard contract sizes better (Bodnar et al., 1995) and large firms are expected to face a larger variety of exposures for which derivatives may be used (Bodnar et al., 1995). On the other hand, Hakkarainen, Kasanen and Puttonen (1997) argue that if the costs associated with financial distress are less than proportional to firm size, size should be negatively related to the extent of hedging. Moreover, Warner (1977) showed that small firms have a higher probability of distress, which also gives them a more compelling reason to hedge.

Testing for a size effect within our sample is not straightforward since we did not only sample out of the largest firms, but also included non-TOP 200 firms that have a CC. The firms that have a CC but are not within the TOP 200 firms are biased towards being users. This makes it more difficult to disentangle the size effect. Nevertheless, with respect to total assets, the simple chi-square test in Table 4, panel A shows a strong size effect. The bias towards the non-TOP 200-CCs can clearly be seen. 15 users are detected within the smallest firm segment. The medium and the large segment, however, show the size effect more clearly. With respect to turnover, Table 4, panel B, shows similar results although the chi-square statistic only has a p-value of 12.2 %.

Table 4: Hedging and a size effect

Panel A	Size (Balance sheet total) in Billion BEF			Total
	< 5.33	5.33-26.8	> 26.8	
Users	15	10	20	45
Non-users	8	13	3	24
Total	23	23	23	69

Pearson Chi-Square = 9.583 (df = 2), which gives a p-value of 0.008.

Panel B	Size (Turnover) In Billion BEF			Total
	<8.23	8.23-22.43	>22.43	
Users	16	10	17	43
Non-users	8	11	5	24
Total	24	21	22	67

Pearson chi-square = 4.210 (df = 2), which gives a p-value of 0.122.

Bodnar et al. (1995) demonstrated that within the Compustat database the use of derivatives strongly depended on sector. In commodity-based industries almost half of the firms were using derivatives. In retail/wholesale trade or services, the number of users drops to less than one third. Most empirical studies simply state that their sample is drawn from a variety of sectors. Those who look for a sector-effect are usually able to document one. We did not pursue formal statistical tests but could clearly see that the proportion of hedgers was especially very high in the chemical industry.

Suppose that the average number of currencies used measures the degree of internationalisation. In this case two important conclusions can be drawn. First, in general the users are dealing with more currencies than the non-users. On average, although the difference is not statistically significant, the users are dealing with 15 currencies, the non-users with 12. Second, and more pronounced, the CCs are dealing with more currencies than the non-CCs. More detailed information can be found in Table 5.

*Table 5: Degree of internationalization measured by the average numbers of currencies used*

	<i>Headquarters in Belgium</i>		<i>Headquarters not in Belgium</i>	
	<i>Users</i>	<i>Non users</i>	<i>Users</i>	<i>Non users</i>
CCs	14	17	19	12
Non CCs	11	14	9	10

Another difference that can be noticed in the sample is that the average number of staff working in the treasury department is larger for the users than the non-users. Table 6 also indicates that there is little difference between the CCs and non-CCs. Only in the category of users with HQ not in Belgium, do CCs assign notably more staff to treasury operations than non-CCs.

*Table 6: Average number of staff working in the treasury department*

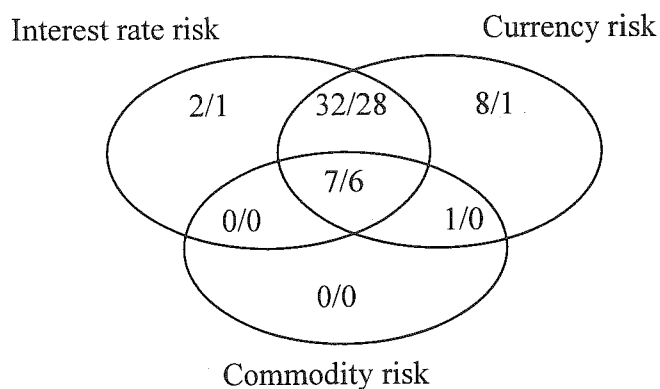
	<i>Headquarters in Belgium</i>		<i>Headquarters not in Belgium</i>	
	<i>Users</i>	<i>Non users</i>	<i>Users</i>	<i>Non users</i>
CCs	5.4	2.5	7	2.4
Non CCs	4.6	3	2.1	2.3

#### **4. For which risks do firms use derivatives ?**

Phillips (1995) showed that 90% of the large American firms are exposed to interest rate risk. 75 % of the firms were affected by currency risk and only 36.6 % experienced commodity risk. There is no compelling reason to suspect that in an open economy such as Belgium, the exposures will be smaller. The question as to which risks Belgian firms are actually managing can be answered fairly easily. Figure 2 shows that of the 49 firms in our sample, only two firms do not hedge currency risk. The reason for this result is simple. Both firms are not confronted with currency risk since their parent company is taking care of that. The other firms hedge currency risk mainly in order to hedge transaction risk. 70.2 % hedges current contractual commitments, 68 % also hedges anticipated transactions up to one year. Only one fifth of the hedgers in our sample is hedging expected transactions beyond one year. Hedging foreign repatriations such as dividends, royalties and interest payments is a rationale for using derivatives for half of the hedgers. With respect to this issue CCs cite this reason significantly

(5 % level by a chi-square test) more than non-CCs. Economic exposures are hedged by 34 % whereas translation risks only attract the attention of 12.8% of the hedgers.

Figure 2: Hedging profile of our sample



Note : The first number indicates the number of firms in the sample of hedgers. The second number indicates the number of firms within the sub-sample of CCs that hedge.

Firms hedging commodity risks only make up 16 % of our sample. Compared to the 26 % of Jalilvand and Tang (1996), firms operating in Belgium are not equally concerned with commodity risk<sup>8</sup>. Of course, Canada has more natural resources and more companies involved in mining, forestry, agriculture, which may explain this profound difference. Belgian firms that do hedge commodity risk can primarily be situated in manufacturing. These firms mainly want to lock in their input prices. Figure 2 also reveals that the firms hedging commodities are hedging currency and interest rate risk as well. The majority of the firms, however, only hedge currency risk and interest rate risk. The most cited reasons for interest rate hedging are reducing the company's interest rate exposure (79.5 %) and locking in financing rates (68.2 %). Surprisingly, minimising interest rate volatility is only withheld by 29.5 % of the firms as a hedging rationale. Although most firms hedge their short term (3-6 months) interest rate exposure, a large fraction is also considering interest rate risk up to a time horizon of three years. Equity risk, which is of main concern for investment managers, is not of great concern for the vast majority of treasurers. Only 8 % (all CCs) claims hedging equity risk. Also, a systematic asset-liability management is only aimed at by 16.3 % of the companies.

With respect to CCs Figure 2 shows that CCs are 'total hedgers'. They hedge currency and interest rate risk and, if deemed necessary, also commodity risk. Only one CC is targeting its hedging activities on currency risk only.

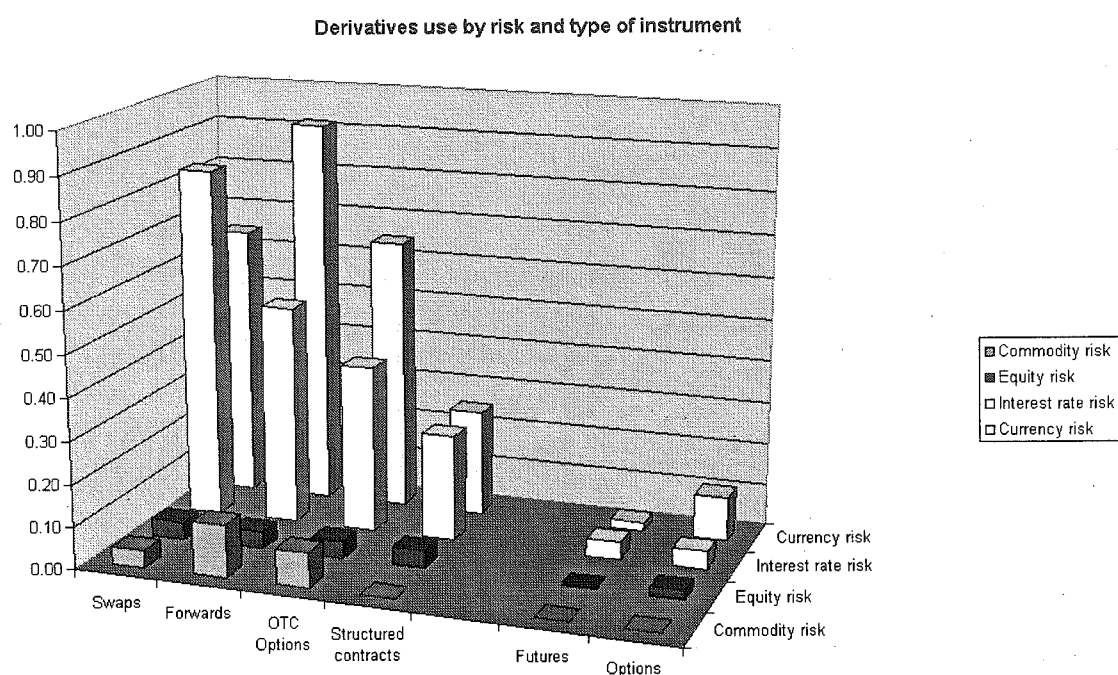
<sup>8</sup> For the US Phillips (1995) also reports a much higher proportion of commodity risk hedgers : 3.1 % together with interest rate risk, 2.7 % together with currency risk and not less than 30.8 % together with both currency and interest rate risk.

### 5. Types of derivatives used

The respondents were asked to indicate which kinds of derivatives were used to manage their currency, interest, equity and commodity exposure. Figure 3 summarizes the results. At first glance, the results of the previous section are confirmed: currency and interest rate exposures are most hedged by means of derivatives. Moreover, there is a big difference between exchange-traded and over-the-counter products. Futures and exchange-traded options only play a marginal role in corporate risk management. Bodnar et al. (1995) documents that large firms use more OTC products than their smaller counterparts. In our sample, the minority of firms that indicate that they use exchange traded products are all CCs.

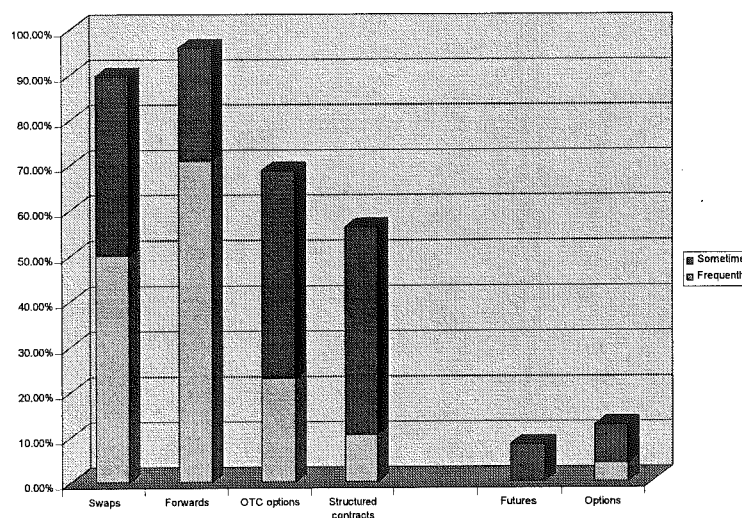
Also, there is a striking dominance of symmetric products (forwards, swaps) over the asymmetric options. These results are perfectly in line with Bodnar et al. (1995). The most favoured instruments for forex (forwards) and interest rate management (swaps) are the same as well. Companies operating in Belgium seem to use more swaps for currency risk management than their American counterparts. For interest rate risk management, forward rate agreements are also much more present in the list of instruments used by our respondents than by the respondents in the Wharton study.

Figure 3: Derivatives use by risk and type of instrument



While Figure 3 demonstrates which derivatives are being used in actual risk management practices, Figure 4 focuses at the frequency of use. Not surprisingly, forwards and swaps are the most frequently used hedging instruments. Other over-the-counter products such as OTC-options and structured derivatives are used occasionally. Exchange traded products, on the other hand, do not seem to be very attractive. This result does not come unexpected. Volumes on BELFOX, the Belgian Futures and Options Exchange, have always been very low and they are still shrinking in anticipation of the EMU. Furthermore, OTC-products offer much more flexibility in structuring the instrument according to the needs of the hedger.

Figure 4: Frequency of use



## 6. Internal organization of the risk management program

Although several multinational companies such as Eastman Kodak, Compaq and Merck have been using risk management on a strategic level (Ahn and Falloon, 1991), the way to strategic risk management still seems to be a long and winding road for most companies operating in Belgium. 85.6% state that they have a policy on risk management. For the CCs this is even 92.3 %. A chi-square test indicates that the difference between CCs and non-CCs having a risk management policy is significant (5% level). Most of the time, this policy is formulated by the board of directors or by the executive committee in consultation with the treasury department (56 %)<sup>9</sup>. For 44 % of the hedgers in our sample the treasurer himself was the sole responsible for formulating a hedging policy. This can hardly be characterized as strategic hedging. According to the persons who completed the questionnaire, half of the companies that have a hedging policy integrate this policy within their strategic plan<sup>10</sup>. Still, after double-checking, we can conclude that this is probably an overoptimistic view. Of the 21 firms that claim to incorporate their hedging policy within a strategic framework, 57 % do not apply any method for evaluating the risk of specific derivative transactions of portfolios (sic). Furthermore, in 30 % of the so-called strategic hedgers, the treasurer himself monitors compliance with the dictated policy<sup>11</sup>. The small percentage (16 % of our total sample) of hedgers that pursue asset-liability management also points in this direction. Risk management policy is not rigid. Half of the policy formulators review their hedging policy on a calendar basis. Most have annual revisions, although some firms indicate up to monthly revisions. The other half reviews its policy on an ad hoc basis. With these results in mind, it seems fair to conclude that most of the hedging activities are situated on the tactical level.

<sup>9</sup> This result contrasts with Price Waterhouse (1995). They found that the board of directors had little involvement in the development and the approval of the policy. We should keep in mind, however, that Price Waterhouse only studied 16 Belgian companies.

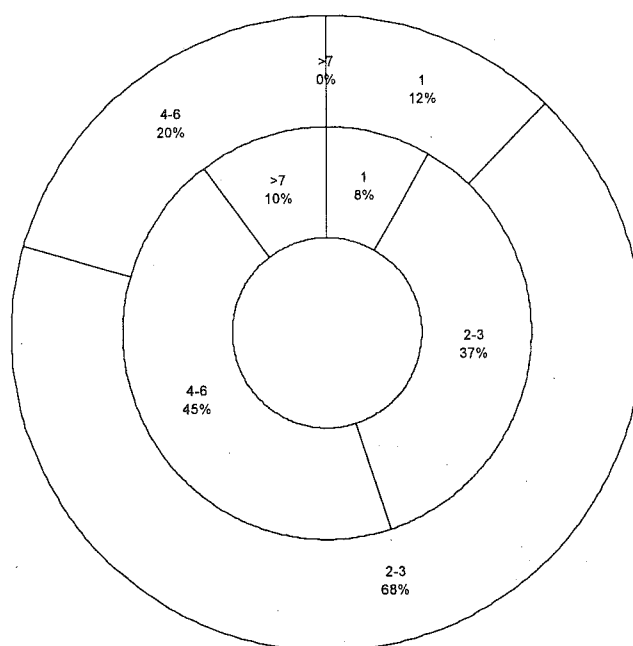
<sup>10</sup> For the CCs this percentage is slightly higher: 56 %.

<sup>11</sup> For the complete sample of hedgers that have a policy on the use of derivative products in risk management (42 firms), 20 firms indicate that the CFO is responsible for monitoring compliance with the policy. 18 firms say that this responsibility rests on the shoulders of the internal auditors. Only a small minority shifts this responsibility to the treasurer himself.

Treasury departments are characterised as a service or a cost centre in roughly 70 % of the firms. 15 % has not defined the role of the treasury department and only 15 % (12 firms) sees its treasury department as a profit centre. Strikingly, none of the firms that call themselves profit centre take positions unrelated to its underlying exposures in order to add value through arbitrage or other active (speculative) strategies. Also, in our total sample the proportion of firms that speculate from time to time is small (6 % of the derivative users), indicating that indeed pursuing non-trade related profit is not a core activity of a treasury centre. Price Waterhouse (1995) conjectured that the introduction of Value at Risk systems was high on the agenda of many profit centres. This cannot be confirmed in our sample. The profit centres in our sample differed in no systematic way from service or cost centres with respect to a structured performance measurement.

When trading derivatives, treasury departments are mainly supported by banks. Consultants and brokers only play a marginal role. Figure 5 (inner circle) shows that treasurers deal with more than one banker when trading derivatives. 45 % even deals with 4-6 banks. Before entering in a derivative trade most treasurers ask quotes from 2-3 different banks.

*Figure 5: Number of banks/quotes the treasurer works with/asks for*



Note: Inner circle: Number of banks ; Outer circle: number of quotes

Hedgers obtain their financial information mainly (74 %) from data providers such as Reuters, Bloomberg, Telerate, Datastream, .... Remarkably, 12 hedgers (26 %) did not have access to professional data providers and obtain their information from banks or consultants. In contrast, only 32 % of the non-hedgers have access to professional data providers. The others rely on banks or in some cases on information provided by the parent company's treasury department.

The valuation of the derivatives position is most frequently done on a monthly basis (37 % of the hedgers). 14.6 % value on a weekly basis and 21 % aim at a daily valuation of their positions. 27 % of the hedgers do not schedule position valuation on calendar basis but values their derivatives positions whenever this is needed. 70 % of the hedgers rely on the treasurer for pricing the derivatives used. Banks are the backbone of the valuation attempts for 25 % of the hedgers.

Performance measurement of the treasury department is a non-trivial issue that many companies do not get involved with. More than 40 % of our respondents felt that performance measurement was of low or even of no importance. They even did not apply any performance measurement. Only 21% considered this issue as very important. These companies structured their measurement system mostly according to generic risk types (interest rate, currency and commodity risk). Alternatively, a performance measurement system on transaction level was used. With respect to this issue, CCs act significantly (5 % level by a chi-square test) differently from the non-CC firms. CCs on average stress the importance of performance measurement.

Although we cannot evaluate the degree of professionalism firms are using, 15 firms<sup>12</sup> (31.9 % of the hedgers) claim to use a Value at Risk system in order to follow the risk of their positions. Stress testing, scenario analysis and duration analysis are other fairly frequently cited methods. Typically, the companies that use these kinds of performance measures are CCs. 46.8 % of the hedgers did not use any performance system at all.

Bodnar et al. (1995) and Price Waterhouse (1995) show that end users do not rely heavily on outside vendors for management and reporting activities. Spreadsheet technology is especially popular (85.5 % of the hedgers). To a lesser extent, third-party software (33.3 %) and software developed by brokers/banks (22.9 %) are used. The main obstacles in acquiring the necessary software are the lack of a sufficient volume of derivatives positions (46.8 %), the cost of the technology (38.3 %) and the availability of skills and knowledge (14.9 %).

Most of the treasurers report to the board of directors on a monthly basis<sup>13</sup> (41 %). 25 % of the treasurers report more frequently. This is in sharp contrast with Bodnar et al. (1995), who found that 53 % of the US hedgers did not schedule the reporting frequency to the board. Only 7 % of the US respondents reported on a monthly basis. With respect to external reporting, Bodnar et al. (1995) found that approximately 70 % of the users disclosed derivatives use in the financial statements. Of our respondents two thirds disclose information about their derivatives use. 44 % simply mention the use of derivatives, 38% give a small summary and a small minority reports extensively. It should be noted here that many companies restrict their use of derivatives because they do not properly understand the accounting treatment.

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<sup>12</sup> 12 of these firms were CCs.

<sup>13</sup> If firms hedging more than 75 % of their exposures are considered as 'heavy hedgers', it should be noted that such heavy hedgers report less frequently to the board of directors than the 'moderate hedgers'. Heavy hedgers prefer a quarterly report, moderate hedgers report monthly or even on a weekly or daily basis.

## *7. Conclusions*

In order to avoid a summing up the various results of the paper, we would like to conclude with a general impression that we obtained from screening the answers to the questionnaires. It is clear that a significant part of large Belgian firms have set their first steps on the road towards risk management. The process of setting up a good risk management system is definitely not in a final stage for most of the companies. Risk management should be incorporated in a strategic view about the firm. We have come to an age in which financial risk cannot be separated from a global view on the firm.

The position and the role of the treasury department within the firm are not well defined. Treasury departments are defined as cost, profit and service centres. Sometimes they do not get any of these labels. Consequently, performance measurement of the treasury department becomes a very tricky issue. While admittedly, tailor-made solutions cannot be easily suggested, thinking about the issue is still better than ignoring it as a large proportion of our respondents did.

The risk management technology used is still relatively simply. A huge challenge is presented to companies, academics and consultants. The suppliers of derivatives still have a lot of work too. Exchanges really should consider examining why their products are not attracting corporations that are nevertheless massively buying OTC products. Banks, on the other hand, can gain in market share if they convince top management of the usefulness of risk management. For all parties concerned, the conclusion seems to be the same. As the Beatles put it, there is still a long and winding road in front of us.

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## Executive summary

Today the financial environment is more volatile than it was two decades ago. Firms are facing various types of financial risk in exercising their daily activities. Coping with financial risk by moving operations back and forth across national borders is not a tractable and financially feasible solution. The rise of derivative markets have made it possible to cope with financial risks in a cost effective way by shifting them to economic agents who are willing to bear these risks. Hence, with the advent of derivatives, firms have a whole set of 'new' instruments at their disposal to manage these risks and to reduce their overall exposure. As to the reasons why firms should or should not hedge, the discussion is still going on. Although the theoretical literature provides a number of valid reasons why firms should consider hedging, the actual practices of derivatives usage by non-financial firms is definitely not well documented. Especially, the empirical evidence on the corporate use of derivatives for risk management on the European continent is very limited. To fill this gap, we conducted a survey on the use of derivatives by non-financial large firms operating in Belgium. Our study aims at giving an overview of several questions which were raised in the literature. Which financial risks are being managed? How widespread is derivatives use? Which types of derivatives are being used? How is a risk management policy implemented? How is performance measurement and reporting structured?

*How widespread is the use of derivatives?* The results of our study suggest that the majority of the large firms is using derivatives. Only one fifth of the non-users has the intention to consider derivatives for hedging purposes in the future. Policy restrictions, the riskiness of the products, the insignificance of the exposures and the existence of other hedging alternatives are the most frequently cited reasons for not using derivatives. Derivative suppliers clearly face an important educating task towards top management to lift the corporate policy restrictions if they want to unlock this market potential.

*Which risks are being managed?* Large Belgian firms use derivatives primarily to manage currency risk and interest rate risk. Commodity risk and equity risk are much less hedged. The proportion of firms that speculate from time to time is also very small, indicating that indeed pursuing non trade related profit is not a core activity.

*Which types of derivatives are being used?* As for the types of derivatives used, two major conclusions can be drawn. First, there is the dominance of symmetric products (forwards, swaps) over the asymmetric options. Second, over-the-counter (OTC) products are preferred to exchange-traded products. The latter only play a marginal role in corporate risk management. One of the reasons is that OTC-products offer much more flexibility in structuring the instrument according to the needs of the hedger.

*How is the risk management policy implemented?* A significant part of large firms operating in Belgium have set the first steps on the road towards risk management. The process of setting up a good risk management system is definitely not in a final stage for most of the companies. Indeed, risk management should be incorporated in a strategic view about the firm. Although the majority of the users seems to have a policy on the use of derivatives for risk management, several facts indicate that this can hardly be characterised as strategic hedging. Although most of the time the policy is formulated by the board of directors or by the executive committee in consultation with the treasury department, in a lot of cases the treasurer himself was the sole

responsible for formulating a hedging policy. Moreover, only half of the companies that have a hedging policy claim to integrate this policy within their strategic plan. Even this is probably an overoptimistic view, because approximately half of the firms that claim to incorporate their policy within a strategic framework do not apply any method, like value at risk, stress testing, and duration or scenario analysis, for evaluating the risk of their derivative transactions or portfolios. Furthermore, for a considerable part of the so-called strategic hedgers, the treasurer himself monitors compliance with the dictated policy.

*How is performance measurement structured?* Performance measurement of the treasury department is definitely a non-trivial issue. Our results indicate that the position and the role of the treasury department within the firm are not well defined. Treasury departments are almost randomly defined as cost, profit and service centres. Sometimes they do not get any of these labels. Consequently, many companies do not get involved with performance measurement. While admittedly tailor-made solutions are not easily suggested, thinking about the issue is still better than ignoring it as a large proportion of our respondents did.

*Which technology is being used?* Risk management technology also is still relative simply. Spreadsheet technology is especially popular. To a lesser extent third party software and software developed by brokers or banks are being used. The main obstacles in acquiring the necessary software are a lack of a sufficient volume of derivatives positions, the cost of the technology and the availability of skills and knowledge.

A huge challenge is presented to corporations, academics and consultants. The suppliers of derivatives have still a lot of work too. Exchanges really should consider examining why their products are not attracting corporations that are nevertheless massively buying OTC products. Banks, on the other hand, can also gain in market share if they convince top management of the usefulness of risk management. For all parties concerned, the conclusion seems to be the same: they still have a long way to go.