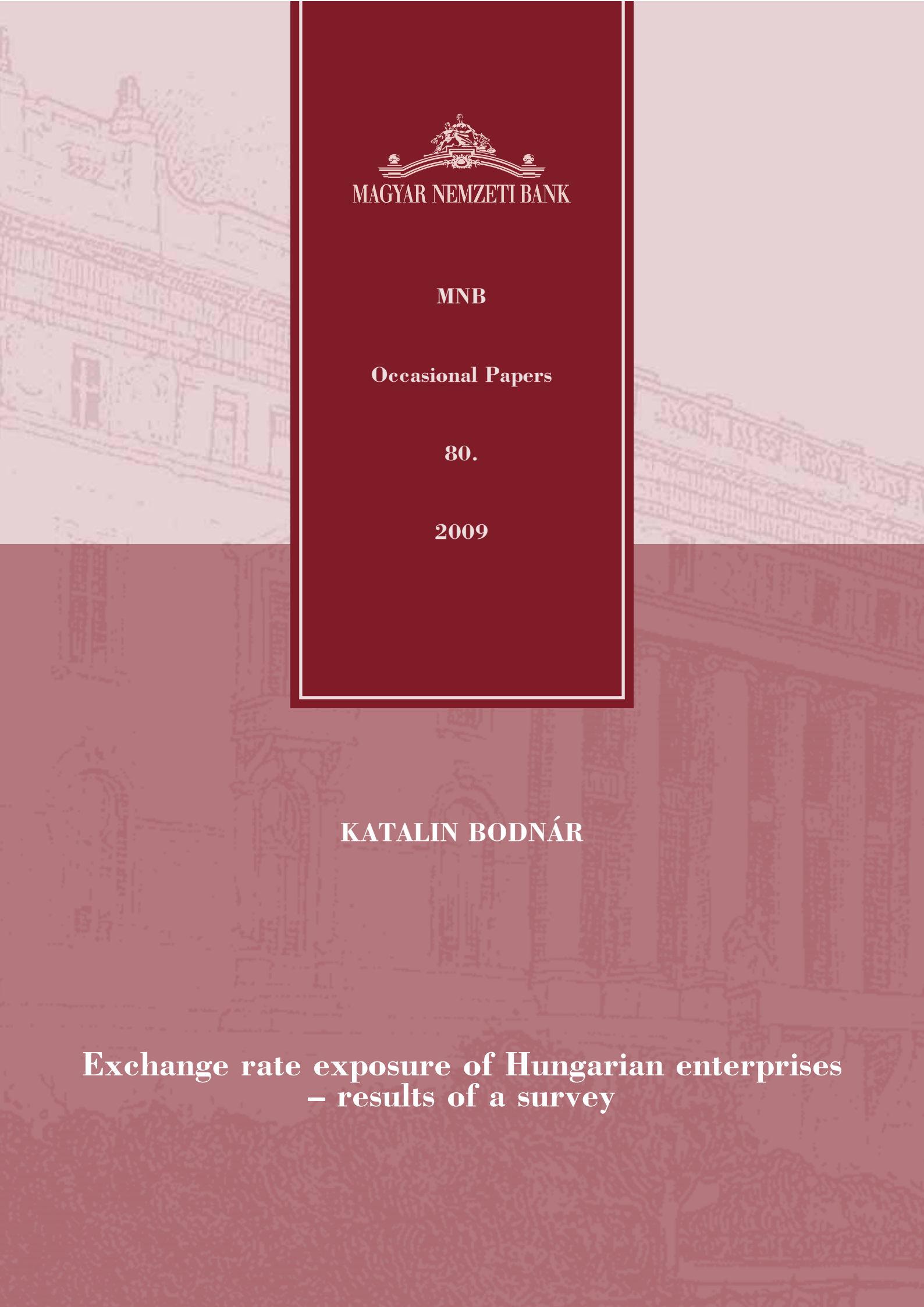

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Exchange rate exposure of Hungarian enterprises – results of a survey

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Exchange rate exposure of Hungarian enterprises – results of a survey

(A magyar vállalatok árfolyamkitettsége – egy kérdőíves felmérés eredményei)

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Contents

Abstract

In this paper, I examine the exchange rate exposure of Hungarian enterprises from a financial stability perspective. In connection with the recent growth in FX loans to enterprises, the central bank assesses the vulnerability of the banks' loan portfolio to changes in the exchange rate. To collect company-level data, two surveys were carried out on exchange rate exposure and exchange rate risk management practices. The first survey carried out in 2005 showed that the majority of small and medium-sized enterprises are exposed to exchange rate depreciation, but that exchange rate risk management techniques are almost unknown to them. In the 2007 survey, which is summarized here, large enterprises were also examined, as well as motives for borrowing in foreign currency and the lack of FX risk management tools. Based on the results, the main motive for raising FX debt is lower interest rates, while at large enterprises natural hedging also appears as a factor. The main reason for ignoring FX risks is that FX risk management tools are thought to be expensive, complicated or ineffective. The majority of enterprises think there are no suitable tools to manage FX risks or they expect external solutions, such as the introduction of the euro to decrease their risks. Based on calculations on aggregated balance sheet data, exchange rate depreciations would improve the profitability of the corporate sector as well as its capability to repay the debts. However, micro-level calculations suggest that exchange rate depreciations increase the ratio of loss-making enterprises to a larger degree than exchange rate appreciations. These calcuations do not take competitiveness and other long-term effects of exchange rate changes into consideration, thus, the results have to be treated with caution.

Keywords: exchange rate exposure, FX borrowing, FX risk management, survey, probit.
JEL: C25, C42, F31, G21, G32.

Összefoglaló

Ez a tanulmány a magyar vállalatok árfolyamkitettségét vizsgálja pénzügyi stabilitási szempontból. A devizahitelek elmúlt időszakbeli emelkedése miatt a jegybank a bankok hitelportfoliójának árfolyam-elmozdulásokra való érzékenységét vizsgálja. Ahhoz, hogy ezt a kérdést vállalati szintű adatokon vizsgálhassuk, két kérdőíves felmérést végeztünk az árfolyamkitettség és árfolyamkockázat-kezelés témakörében. A 2005-ös felmérés megmutatta, hogy a kis- és középvállalatok többsége ki van téve az árfolyam leértékelődésének, azonban az árfolyamkockázat kezelési technikákat nem ismerik. A 2007-es felmérésben, amelynek eredményeit jelen tanulmány tartalmazza, a nagyvállalatokat is megvizsgáltuk, csakúgy, mint a devizában történő eladósodás motívumait és az árfolyamkockázat kezelés hiányának okait. Az eredmények alapján a devizahitel felvétel elsődleges motívuma az alacsony kamat, míg a nagyvállalatok esetében a természetes fedezés is megjelenik. Az árfolyamkockázatot számos vállalat figyelmen kívül hagyja, amit az magyaráz, hogy a kockázatkezelési eszközöket sokan drágának, bonyolultnak, illetve hatástalannak tartják. A vállalatok többsége úgy gondolja, hogy nincsenek megfelelő eszközök a kockázat kezelésére, vagy külső megoldást várnak, mint például az euró bevezetése. Az aggregált számviteli adatok alapján az árfolyam leértékelődése pozitív hatással bírna a vállalati szektor jövedelmezőségére és törlesztési képességére. A mikro szintű számítások szerint azonban a forint leértékelődése nagyobb mértékben növelné a veszteséges vállalatok számát, mint a forint felértékelődése. Ezek a számítások nem veszik figyelembe az árfolyam-változások versenyképességi és egyéb hosszú távú hatásait, emiatt az eredmények értelmezésekor indokolt az óvatosság.

1 Motivation, previous results

Hungarian banks' balance sheets show an increasing ratio of FX assets and liabilities, although the direct FX risks of banks remain low. Nevertheless, there are many other channels through which exchange rate fluctuations influence banks' profits and soundness. One of these channels is the exchange rate exposure of the corporate sector: if enterprises with debt are exposed to exchange rate changes and exchange rate changes cause losses for them, it may negatively influence banks' portfolio quality and thus impacts financial stability. Since loans to enterprises represent a significant ratio of banks' balance sheets, the potential effects of exchange rate changes on portfolio quality need to be examined.

Nevertheless, this relationship cannot be investigated directly. The reason for this is that FX lending – mainly to SMEs – is a recent development, and thus no long time series are available for study. Moreover, the volatility of the forint exchange rate was low for a long time in the past and even if its volatility did influence portfolio quality, the effects may have been obscured by the quick growth rate of new loans, a phenomenon which usually leads to improvement in portfolio quality indicators. Finally, based on available aggregate data (export and import volumes, FX loans), it is very difficult to assess the risks of banks that are related to the effect of the exchange rate on enterprises, since differences between enterprises disappear in the course of aggregation and the effects of shocks may be underestimated or biased.

In light of these problems, I examine the aforementioned issues by assessing indebtedness, exchange rate exposure, risk awareness and FX risk management amongst enterprises. Thus, the central aim of this study is to answer the following questions:

– *What are the characteristics of enterprises which raise FX debt? What motivates firms to choose FX loans instead of local currency ones?* I examine this topic because one of the main questions concerning FX lending to enterprises is whether or not the borrowers are hedged against FX risks and/or have adequate buffers for unexpected losses caused by exchange rate changes. If they do not, then depreciation of the forint increases their repayment obligations, which may result in a worsening of portfolio quality.

– *How would exchange rate changes affect the financial situation of Hungarian enterprises? Which firms are more exposed to exchange rate changes? Are they aware of their exposure and risks?* This question is examined because FX loans are not the only source through which exchange rate changes can modify firms' financial situation. It is the total exposure from all potential sources which needs to be taken into account. On the other hand, the creditworthiness of all bank borrowers and potential bank borrowers influences the banks' risks.

– *Do enterprises manage their FX risk? If so, what FX risk management tools are used and what are the characteristics of the enterprises which use them? If not, what are the reasons behind this?* This topic is closely related to the exchange rate exposure of enterprises and their risk awareness. It also helps to understand potential ways to improve companies' risk management activities.

In the relevant literature, two main methods are used to measure corporate-sector exchange rate exposure and to examine the use of FX risk management tools. One approach takes public stock exchange information and examines the effect of exchange rate changes on stock returns. The other tries to collect information directly from firms through surveys, asking about the currency structure of their balance sheets and income statement and also about their behaviour. One common feature shared by both these methods is that they use micro data. Due to the small number of traded firms and the lack of a database where the currency structure of firms' balance sheets, off-balance-sheet items and income statements are all available, we have opted to use a survey to gather the desired information.

An earlier survey of 580 Hungarian small and medium-sized enterprises (Bodnár, 2006) indicated that around two-thirds of the respondents are directly exposed to exchange rate changes: i.e. the value of their income, expenditure, assets or liabilities changes if the exchange rate moves. I found that only 4 per cent of enterprises use any derivative instruments and only one-quarter have natural hedging. Two-thirds of the FX loans of the surveyed firms from domestic banks are at firms without any

hedge. If the currency structure of the liabilities is taken into consideration, forint depreciation leads to a larger negative effect on small and medium-sized enterprises (SMEs) than forint appreciation.

The survey revealed that although exchange rate changes could lead to losses at a large ratio of firms, exchange rate risk is not a major concern for most companies. Nevertheless, several questions remained unanswered in that survey. First, only the behaviour of SMEs was examined, in line with the growing significance of this sector, while both from a macro and a financial stability point of view, large companies also play a crucial role. Second, motives behind FX indebtedness and exchange rate expectations of FX debtors were not examined thoroughly. Third, the reasons behind the failure to use exchange rate management tools were also not explained. And finally, while the exchange rate was quite stable in the period before the previous survey, its volatility increased in 2006 and accordingly the behaviour of the enterprises may have changed due to this. This is also a question that is worth examining, since it can explain a potential link between exchange rate changes and firms' indebtedness and hedging behaviour.

This paper consists of the following sections: Section 2 summarises the recent literature on the subject. Section 3 provides an overview on some stylised facts related to FX indebtedness and aggregated data on exchange rate exposure. Section 4 introduces the methodology employed and presents descriptive statistics of the survey results. Section 5 contains an econometric examination of the survey data. Finally, Section 6 discusses the conclusions that can be drawn.

2 Literature review

There are different sources of exchange rate exposure: a firm can have currency mismatch, and thus, its profit will change when items denominated in foreign currency are repriced as a result of exchange rate changes. Above and beyond this, the competitive position of a company and demand for its products or services may also change if the exchange rate moves (operational exposure).[1]

If a firm is exposed to exchange rate changes, it can decrease its exposure through hedging or it can bear the risk. The main motive to hedge is to decrease or eliminate the volatility of profit. This can be explained by tax incentives, the aim to increase leverage, to decrease the expected costs of financial distress, reduce underinvestment costs, or by managerial risk aversion (Graham–Rogers, 2002). Nevertheless, it can also be optimal to bear the risk, if the costs of FX risk management are larger than the expected benefits of accepting the exposure. A firm can also decide to accept the risks in the event that it does not expect exchange rate changes and thus believes that the FX risks are small even if there is exchange rate exposure. This latter perspective, whilst being rational from an individual point of view, might result in an accumulation of systemic risks because of moral hazard problems: expectations of unchanged exchange rates may lead to an underestimation of risks and accumulation of losses in the event of unexpected exchange rate shocks.

There are two main methods in the literature to examine exchange rate exposure and FX risk management. The first is based on examination of the relationship between firms' performance (profitability) and changes in the exchange rate. Most of these papers analyse the reaction of market returns to exchange rate changes (based on the CAPM model).[2] One advantage of this methodology is that by using a panel database, variance in both cross-section and time can be explored. Nevertheless, as market returns are influenced by many factors, there is uncertainty in this methodology and – mainly in respect of emerging countries – the data available are usually not representative for the whole economy. The second method is to carry out surveys with specific questions on exchange rate exposure and company characteristics.[3] Thus, data on a representative sample can be collected, but it is very difficult to obtain time-series data or perform international comparison using this approach.

Raising debt in foreign exchange can decrease or increase exchange rate exposure, depending on the currency structure of the income or assets of enterprises. Thus, FX debt might be the cause for exchange rate exposure, but it can also serve as a hedging tool. In light of the increasing reliance of enterprises on FX loans in developing and transition economies, more and more studies are trying to identify the motives and determinants of the choice of loan denomination.[4] For example, Luca–Petrova (2007) examine the role of company- and bank-specific factors in FX lending. Company-, bank- and country-level factors are examined so that the risks of growing FX indebtedness can be better evaluated. They find that bank-related factors are more important in explaining the level of credit dollarisation than company-related factors. The authors also find that the deeper the forward foreign exchange markets are, the smaller the level of credit dollarisation is.

There is a broad body of literature[5] on the macro consequences of currency mismatches (unhedged exposures): in relation to the Asian and Latin American crises in the 1990s, several studies have examined the consequences of unhedged open FX positions in the aftermath of large depreciations. The consensus result of this literature is that this phenomenon (often referred to as dollarisation[6]) is a double-edged sword. It might have several positive effects, mainly in liquidity restrained, underdeveloped economies. Potential positive effects include the following: financial dollarisation facilitates the deepening of intermediation; it may alleviate the contractionary effect of shocks (for example through its effect on risk management by banks and enterprises); and it contributes to integration into international markets, which can result in greater efficiency of

[1] See for example Douch (1996), Nydahl (1999); Schafer–Pohn-Weidinger (2005).

[2] See for example Bartov–Bodnar (1994), Bodnar–Gentry (1993), Bodnar–Wong (2000), Hagelin–Pramborg (2002), Ihrig (2001), Jorion (1990), Priestley–Odegaard (2002), Priestley–Odegaard (2007).

[3] See for example Aabo (2006), Keloharju–Niskanen (2001).

[4] See for example Aabo (2006), Allayannis et al. (2003), Caballero–Krishnamurthy (2004), Carter et al. (2003); Echeverry et al. (2003), Elliot et al. (2003), Keloharju–Niskanen (2001), Pratap et al. (2003).

[5] See for example Arteta (2003); Claessens–Djankov–Xu (2000, De Nicoló–Honohan–Ize (2003); Goldstein–Turner (2004); Yeyati (2005).

[6] Here dollarisation is used, as is common in the literature, to describe the situation in which any foreign currency is used for some monetary functions instead of the local currency. Particularly, liability dollarisation is the situation when the liabilities of domestic sectors are denominated in foreign currency.

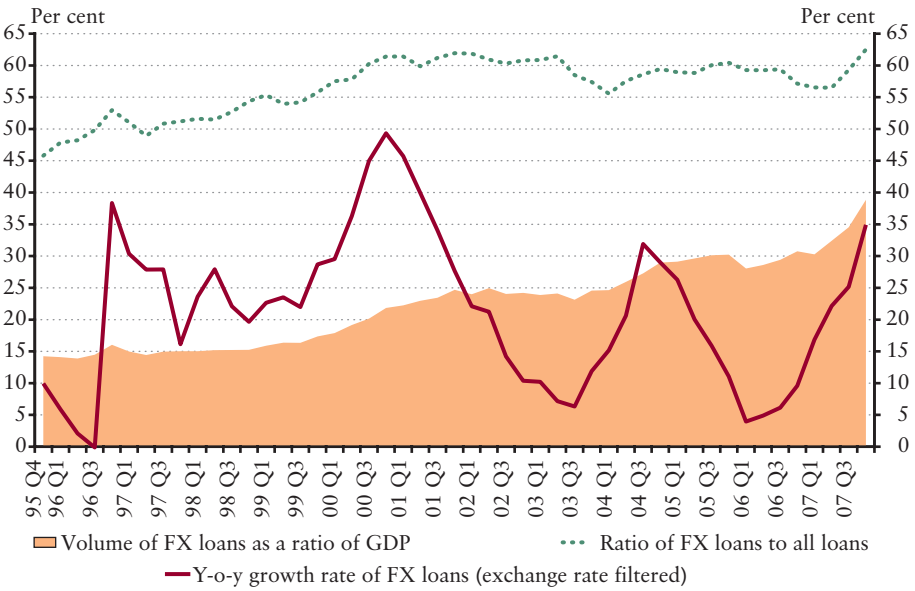
financial intermediation. Nevertheless, authors also emphasise that in many cases currency mismatches contribute to the probability, costliness and length of financial crises. Thus, it is important to examine the exchange rate exposure of the private sector and the possibilities of underestimated risks, and to identify the most fragile sectors.

3 Stylised facts

The majority of the total debt volume of Hungarian enterprises, some 55-65 per cent since 2000, is denominated in foreign currencies. Though this ratio is quite stable, the ratio of FX debt to GDP has increased significantly in recent years (Chart 1), rising to 40 per cent, and it started to dominate in terms of lending to corporations by domestic banks since 2003.

Chart 1

Volume of corporate FX loans to GDP, to all debt and y-o-y growth rate



Source: MNB, financial accounts.

In a historical context, amongst large enterprises (which are mainly foreign owned and/or exporting companies) borrowing in FX from domestic sources has been wide-spread since the mid-1990s, while lending to the retail sector was restricted both in domestic and foreign currency until the turn of the millennium. By that time the market of lending to large enterprises had become saturated and growth potential on this market decreased. From 2001, standard products for small and micro enterprises were developed, in line with their improving financial situation, subsidy schemes and EU support.

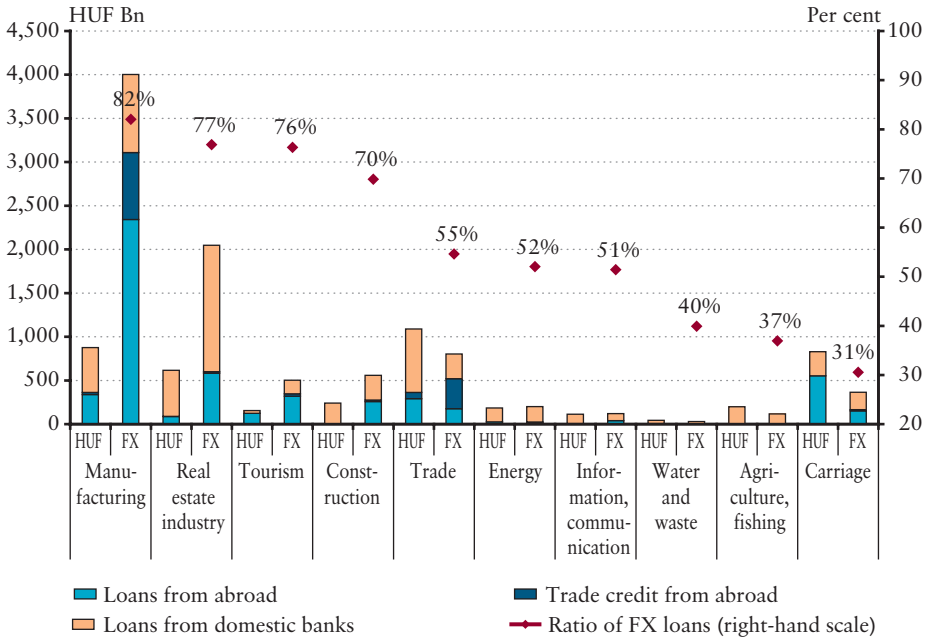
Thus, the intensive growth of FX loans is not independent of the development of the SME lending market, which meant a supply shock on the lending market. As a result, there are fears that the banks are transferring FX risks to enterprises, while the corporate sector as a whole is less efficient in risk management than the banking sector. It is mainly SMEs who are less efficient in risk management. As a consequence, banks have indirect FX risk exposure through the direct FX exposure of the enterprises.

To assess the risks of FX lending to enterprises, it is worth examining the financing structure by industries, which gives an overall view on possible natural hedges. Based on information on the denomination structure of loans from abroad by industries (Chart 2),[7] it can be seen that FX debt constitutes more than half for all debt in most industries, not considering trade credit with domestic partners and loans from domestic non-bank sources. Manufacturing firms predominantly finance themselves with FX loans, mostly from abroad. Since manufacturing enterprises generate a major part of their income from export activity (Chart 3), in the case of these enterprises FX debt in many cases serves as a natural hedging tool. With regard to loans from abroad, the presence of foreign owners also plays a role in the high ratio of FX loans. FX debt volumes in the

[7] Since the beginning of 2008, the new current account data collection methodology makes it possible to examine loans from abroad by industry.

Chart 2

Denomination and source of loans of enterprises by industries, 2008 Q2



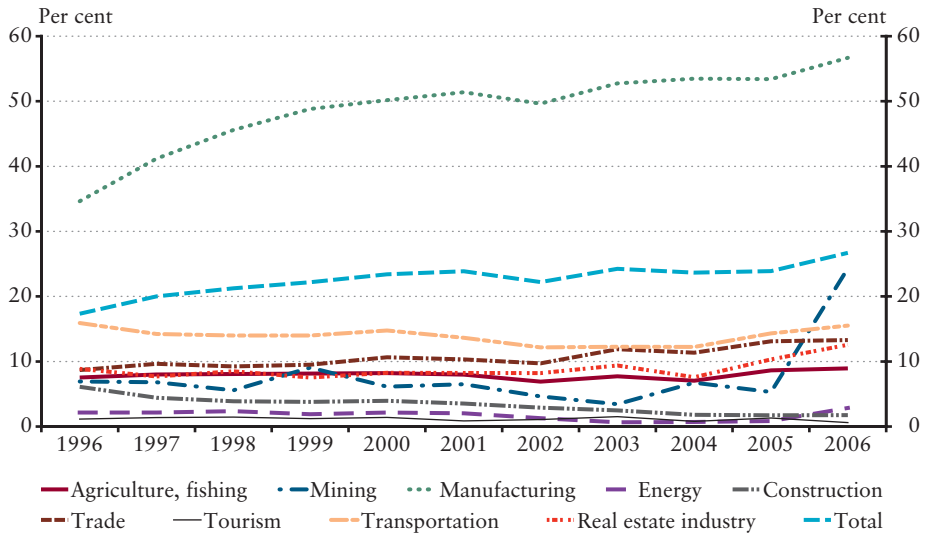
Note: loans from owners are included in the loans from abroad. There is no information about the denomination structure of domestic trade credit and non-bank loans, thus, these are excluded from the chart.

Source: MNB.

real estate industry are also outstanding, even though enterprises in this sector mostly finance themselves from domestic sources. While this industry has no large-scale export activity, part of the income of enterprises in the real estate sector is rents from domestic partners, fixed in euro, and foreign ownership can also be a factor here. The ratio of FX loans to loans from domestic banks is the highest in the case of firms operating in tourism: in this industry enterprises have either transaction or operational exposure because of foreign guests, though the majority of their income is fixed in forint.

Chart 3

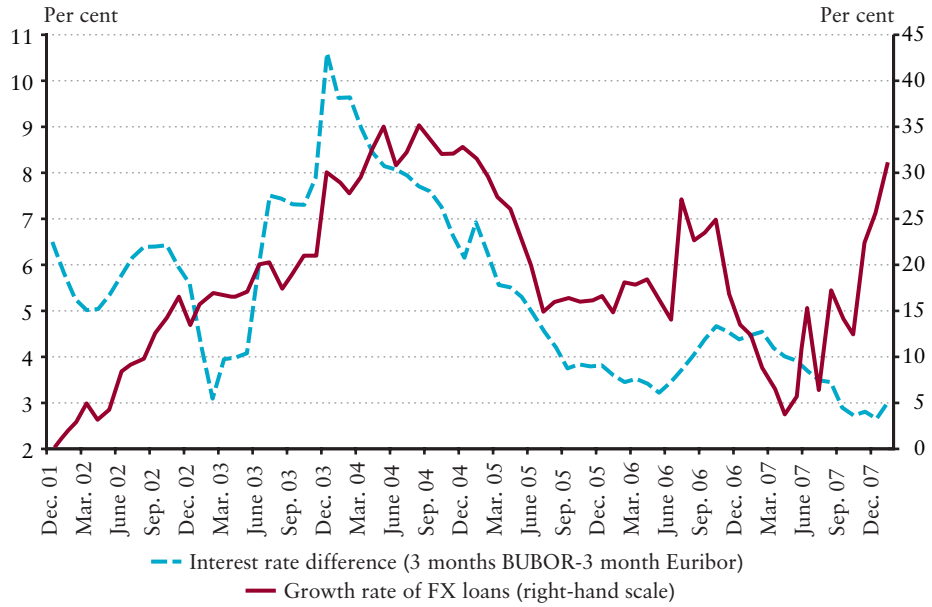
Ratio of export revenues to all revenues by industry



Source: financial statements.

Chart 4

Interest rate differential and y-o-y growth rate of FX loans from domestic banks



Note: FX loans are exchange rate filtered.

Source: MNB, Euribor.

As illustrated above, manufacturing firms – which have the highest export income-to-income ratio (which I assume is positively correlated with the net FX income-to-income ratio) – seem to have the easiest access to foreign sources, mainly to FX loans. Other industries, which are more dependent on domestic banks, also raise a major and increasing part of their loans in FX. With regard to these industries, it can be presumed that the main factor determining demand for FX loans is the interest rate differential. As seen in Chart 4, the increase in the growth rate of FX loans from domestic banks is positively correlated to the interest rate differential to the euro zone for the most part of the period 2003-2006 (correlation: 0.71). Moreover, the low historical volatility of the exchange rate also contributed to an increase in demand for FX loans.

4 Methodology

4.1 INTERVIEWS

Prior to the survey, personal interviews were carried out with some enterprises. In these conversations, we[8] tried to examine the thinking and behaviour of managers that could serve as a basis for the survey so that both the questions and the answers could be formalised in a proper way to obtain valid survey results. Differences between the way company managers think and the way analysts think can lead to misunderstandings of survey results; the purpose was to decrease these potential distortions.

Twenty enterprises were interviewed: managers were asked to summarize financial data of their companies, and their experiences with the effects of exchange rate changes in the past, their decisions concerning indebtedness, and exchange rate management techniques. Although firms were chosen to reflect a high level of diversity, this small sample is not representative of the economy. The aim was rather to find firms that differ in size, industry, geographic situation, export and import position and ownership structure, so that as many different views as possible could be examined.

As the results of the interviews are reflected in the questionnaire, I do not give a detailed overview of the answers here. Nevertheless, some of the answers deserve to be highlighted.[9] Almost all enterprises were exposed to exchange rate changes, if not through foreign trade activity, then through contracts with domestic partners where prices were fixed or paid in foreign exchange. Despite this, firms usually did not assess their exchange rate exposure and they used exchange rate forecasts only for their annual financial plans. Most respondents regularly followed exchange rate changes and calculated accounting profits and losses, but usually they did not do much to prevent these effects. We found several different reasons behind this: some mentioned that they thought nothing can be done; several foreign owned enterprises did not have the right to manage FX risks; some did not even have information whether the parent company performed any FX risk management. Some enterprises had tried to use simpler derivatives, but their profits were decreased and this discouraged them from using them again. These firms considered that FX risk management was a way to realise profits instead of avoiding uncertainty. We also saw examples where the firm or the loss was too small to take preventive steps. Many respondents stated that only the introduction of the euro could result in decreasing their exposure.

As far as FX risk management – where existent – was concerned, it was based on mainly ad hoc decisions. Firms which performed FX risk management, almost exclusively used forwards. Other solutions that were mentioned were keeping books in foreign exchange, transferring the FX risks to the parent company or the main seller which was usually a large company that had more room to manoeuvre to manage risks; exchange rate insurance; or the use of cash pools[10] with firms in the group. Natural hedging was also used by enterprises which had enough liquidity for that, but never played a role when choosing the denomination of a loan.

4.2 SURVEY: SAMPLING, SURVEY DESIGN

The sample consisted of double book-keeping enterprises with at least 5 employees in 2005, and some kind of debt in 2006. The sample was selected randomly from regional groups of enterprises. In case of refusal to answer the questions, a similar firm (according to firm size and industry) was selected from the same regional group.

Data was recorded by data collection staff in the form of personal interviews.[11] The questionnaire[12] consisted of two parts: a set of 'attitude' questions where the opinion of respondents was asked on several questions, and a data sheet where the denomination of assets, liabilities, income, expenditures and instalments were asked. Enterprises were required to answer using data for 2006 and their experiences in the two years prior to the survey. In the personal interviews, the attitude

[8] The sample was chosen and interviews were organised and lead by derive Kft.

[9] Based on the summary of interview results prepared by derive Kft.

[10] Cash pool: common account for the members of a group of enterprises. The members' liquidity and risk management can be improved by using it.

[11] The data collection was accomplished by Magyar Kereskedelmi és Iparkamara Gazdaság- és Vállalkozáselemző Intézet (Research Institute of Economics and Enterprises).

[12] The questionnaire is available upon request.

questions were asked, and afterwards, the respondent filled out the data tables individually and sent them back. In respect of certain things, information was asked in both the attitude questions and in the data sheet parts of the questionnaire; consequently, in the descriptive statistics part I always mention the source of the results.

The questionnaires were filled out by 698 enterprises, of 6,463 asked. The response rate was so low because of the data requirement. The period when the survey was carried out was July–October 2007.

4.3 DESCRIPTIVE STATISTICS

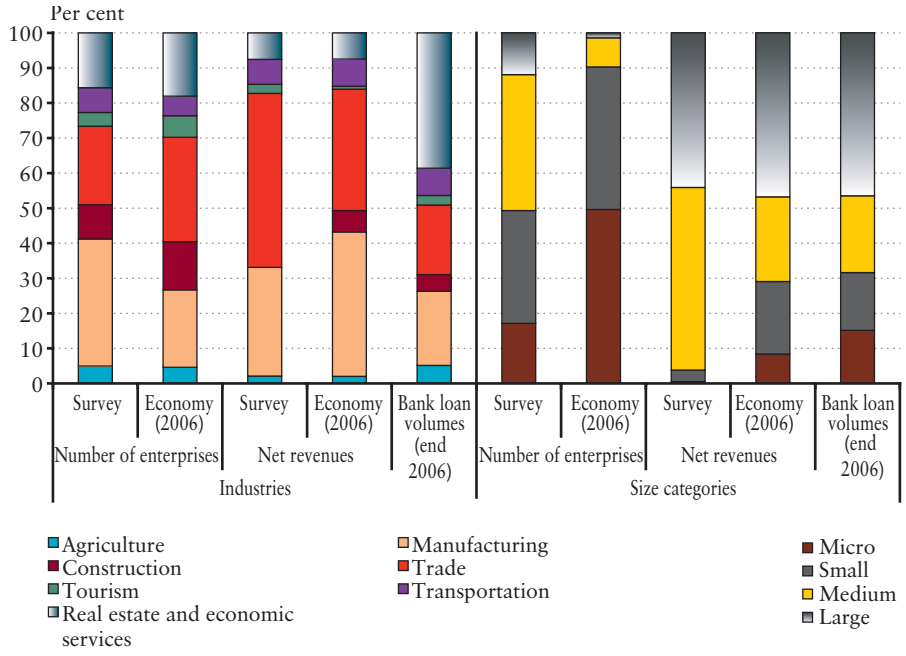
4.3.1 Description of the sample

A total of 698 enterprises answered the questionnaire, but not all answers could be used. As far as attitude questions are concerned, firms in energy, financial and governmental sectors had to be excluded due to their special characteristics or their small share in domestic banks' loan portfolio. Nine enterprises did not prepare a tax declaration in 2006, but had 2005 data. Those that had not prepared a tax declaration since 2004 were also disregarded. This left 672 enterprises. Answers for questions on certain data were incorrect in the case of some enterprises and could not be corrected; because of this, 26 enterprises were disregarded in analysing balance sheet and profit and loss statement data. Three enterprises ceased operations in 2007, but their answers were included in the results. The number of enterprises analysed for the different questions can differ because of some missing data and answers.

Chart 5 presents the distribution of enterprises according to industry and firm size, compared to the economy and the bank loan volumes. The composition of the sample according to industries and size categories reflects both the macroeconomic weights of industries and the banks' exposure. The industry of the firms is not determined only on the basis of the firms' registered TEÁOR (NACE) code, due to its uncertainty. Instead, respondents were asked to define the main activity of their enterprise[13] and they were classified into sectors by these answers. As far as size categories are concerned (based on the number

Chart 5

Distribution of the sample according to firm size and industry, compared to the economy and bank loan volumes



Note: firms with less than 5 employees are excluded from the survey and economy level numbers.

Source: MNB, financial statements, survey.

[13] This was identical with the official TEÁOR (NACE) sectors for 92 per centper cent of the respondents.

of employees),[14] large enterprises have a larger share in the sample than in the macroeconomy (based on their income), in order to ensure a large enough share based on number of firms, and micro enterprises have a smaller share because the aim of this survey was to concentrate on larger enterprises.

Sixty-three per cent of the enterprises in the sample had been operating and regularly preparing their tax declarations for at least 10 years. The average age of enterprises in the sample was 12 years (as opposed to the average age of 6.9 years of enterprises operating in 2006). Because of this, the sample is presumably biased towards better enterprises with a long history, which is beneficial because these firms have experience with exchange rate changes, but this can also lead to an underestimation of risks as they are probably less risky than the average bank client. The difference is partially due to the smaller share of micro enterprises in the sample than in the economy and also to the larger willingness of 'older' enterprises to answer the questions in the survey.

4.3.2 FX indebtedness

Having debt was a filtering criterion for the enterprises filling out the questionnaire. Nevertheless, the debt could be of any type: it could come from a parent company, a bank, a trade partner, and it could be of any maturity and denomination. In the attitude questions, enterprises were asked about their recent experiences with raising debt (in the 2 years prior to the survey). Although this can lead to certain biases since it does not give information on total indebtedness, it is in line with other surveys and makes describing the data easier. Furthermore, a table set was included in the questionnaire to ask about the FX structure of assets, liabilities, income and expenditures. There is no database in Hungary that contains information on this data, and firms are not obliged by law or by the authorities to keep records of the FX structure of their books. Consequently, this part of the questionnaire is very informative, but the data is biased as many enterprises did not supply the information that was requested.[15] Because of this, I mainly use the answers to attitude questions to describe the results.

Based on these answers, almost 80 per cent of the respondents had raised a loan during the 2 years before the survey. Half of the enterprises had FX loans (raised at any time), while the other half had exclusively HUF debts. The main motives for enterprises to raise debt were to finance investments or inventories, whilst the motivation of increased liquidity needs was cited less frequently. The majority of the enterprises had short-term loans (with less than 1-year maturity), and the main source of financing was the banking sector.

In the following, I list the main findings of the survey concerning FX indebtedness, and present some arguments on the basis of the survey results.

Finding 1 The ratio of firms with FX loans is about the same for SMEs as for large enterprises, but they have somewhat different motivations for raising FX debt.

Based on the answers to the attitude questions, 40 per cent of the enterprises raised an FX loan during the 2 years before the survey. The ratio of enterprises with FX loan increases by size, but the difference between size categories in the ratio of firms with FX loans is not very large. Among FX loans, CHF is dominant among micro enterprises, while the significance of EUR loans increases with the firm size. This may provide some explanation for the smaller volumes of CHF loans in bank loan volumes.

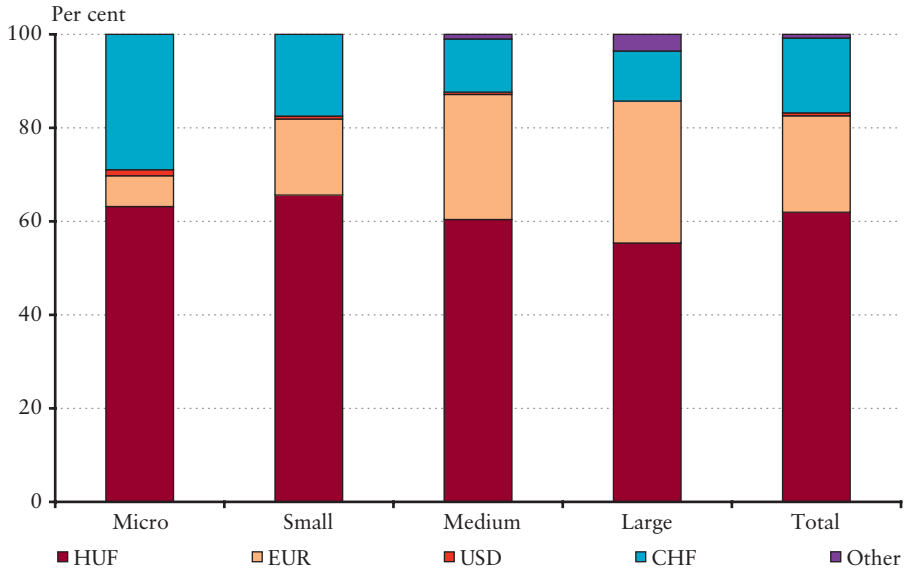
Based on the data tables, debt volumes were also examined. This information reflects a somewhat different picture from the attitude questions. Based on data, only 20 per cent of all loans are denominated in FX (while the 'real' ratio is 60-65 per cent, see Chart 1), concentrated at 25 per cent of the sample enterprises (the average ratio of FX debt to balance sheet total is 17.5 per cent). Thus, presumably data are biased towards lower FX loan rates. The positive relationship between the ratio of FX loans and firm size, however, also can be stated, and the connection is stronger than in the case of the attitude questions. Loans of sample enterprises from domestic banks, however, show a different picture. Here, 30 per cent of loans are raised in foreign exchange, and again a positive relationship between firm size and the ratio of FX loans can be seen. It is also worth

[14] The size categories are the following ones: micro enterprises: less than 10 employees; small enterprises: 10-50 employees; medium-sized enterprises: 50-250 employees; large enterprises: over 250 employees.

[15] This conclusion is partially drawn from the comparison of export revenues from a financial statements database and FX revenues reported in the survey. See 4.3.3.

Chart 6

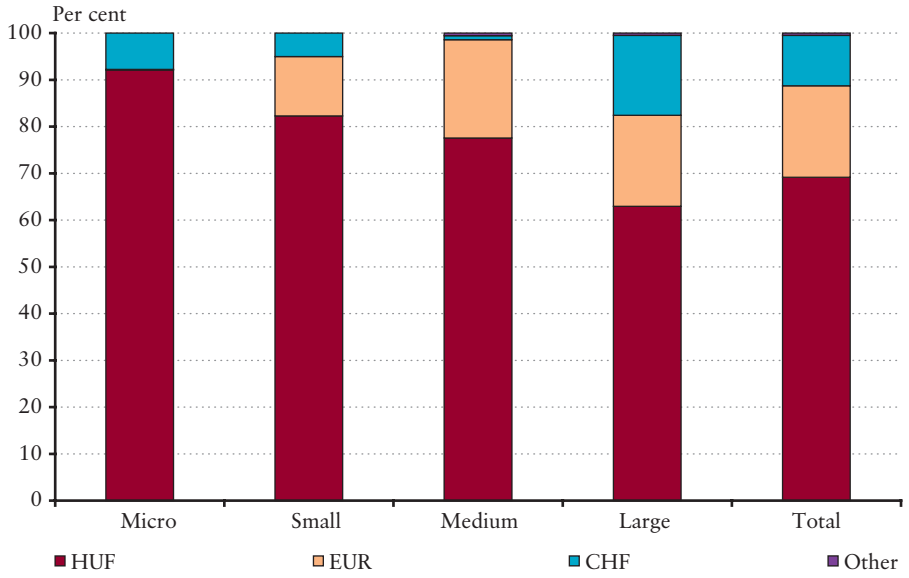
Denomination structure of debt



Source: survey, attitude questions, number of enterprises.

Chart 7

Denomination structure of debt from domestic banks at sample companies



Source: survey, data tables.

mentioning that micro enterprises in the sample have only HUF and CHF loans from domestic banks; EUR loans are used only by larger enterprises.

Although there is no significant difference between the size categories in the ratio of firms with FX loans, there are differences in their motives to have FX debt (Chart 7). As a whole, the main motivation to have FX debt is that it is cheaper than HUF loans: fifty per cent of enterprises mentioned this reason, with the ratio of these answers decreasing by firm size. Only 29 per cent of enterprises with FX loans stated that even if they take risks into consideration, FX loans are more reasonable (see Table 1), and this is also a positive function of firm size.

Table 1

Costs and risks of FX loans

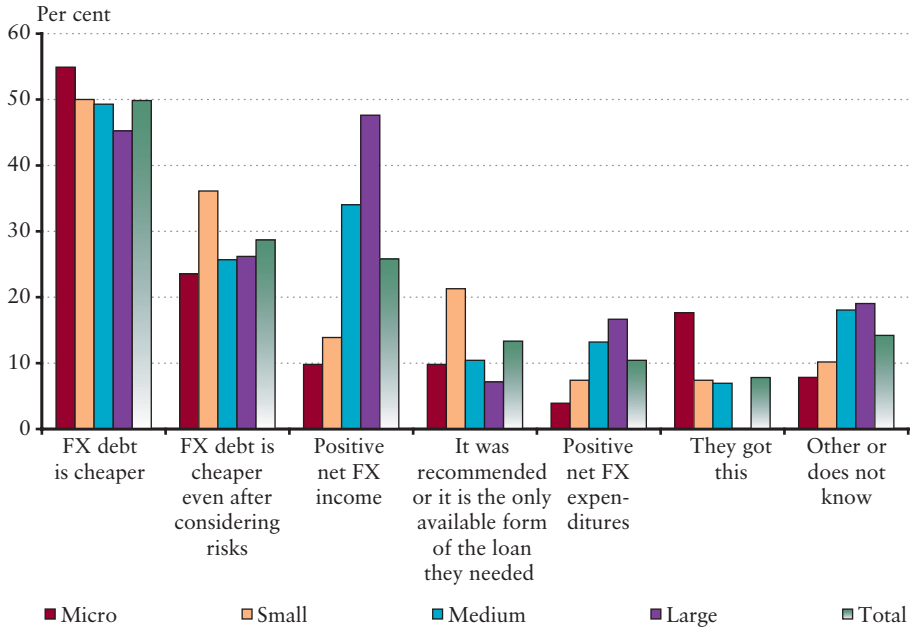
		Decided to raise FX loan because it is cheaper, even if considering risks		Total
		Chose	Did not choose	
Decided to raise FX debt because it is cheaper	Chose	55 (16%)	**119 (34%)** (enterprises which presumably disregard risks)	174 (50%)
	Did not choose	45 (13%)	128 (37%)	173 (50%)
Total		**100 (29%)** (enterprises which take risks into consideration beside prices)	247 (71%)	347 (100 %)

Source: survey, attitude questions.

In the case of large and medium sized enterprises, having FX income was also an important reason behind raising loans in foreign exchange, and thus in their case hedging purposes also motivate FX indebtedness. For a significant ratio of larger firms, however, FX loans were motivated by having FX expenditures, as they finance expenditures from the loans. This means that natural hedging does not appear in their case; moreover, if both the value of the FX expenditure and the amount of FX loan is fixed in HUF, their exchange rate exposure is increased.

Chart 8

Motives to raise FX debt



Note: interviewees could mention more than one reason, the answers were classified afterwards. The chart shows the ratio of enterprises who mentioned the different factors.

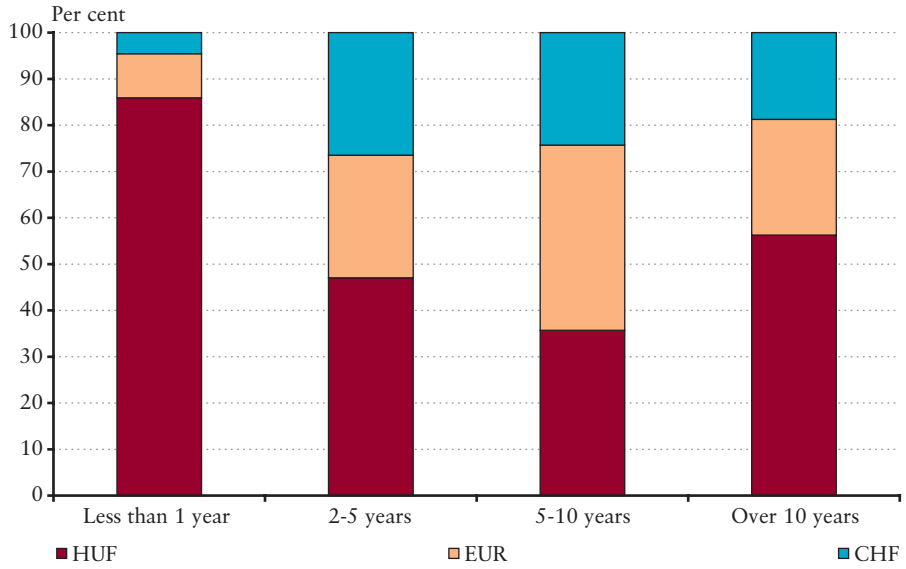
Source: survey, attitude questions, number of answers.

Finding 2 FX debts are of longer maturity and more probably investment loans than HUF loans.

Two differences between HUF and FX loans can be found when examining the maturity structure of loans and loan purposes. First, while short-term loans are denominated mainly in HUF, longer-term loans are in EUR or CHF. On the other hand, the ratio of FX loans decreases again in the case of loans with more than 10-year maturity. Second, this connection between denomination and the maturity of loans is in line with the denomination structure of loans for different purposes: the ratio of enterprises with FX loans is higher in the case of investment loans, while loans to finance stocks or short-term liquidity needs are predominantly denominated in HUF.

Chart 9

Maturity and denomination structure



Source: survey, attitude questions.

The finding that longer-term loans tend to be more denominated in FX than short-term loans can be explained by demand or supply side factors. On the demand side, the reason may be that for enterprises, the interest rate difference matters more over the longer term than it does over the short term. Another reason may be that firms try to match the denomination of their expenditures with the denomination of the loans, and they need liquidity financing to cover expenses which appear in HUF. On the supply side, however, it may be the case that firms which need liquidity financing (in domestic currency) are in a worse financial situation (see Finding 3), and by giving HUF loans, banks eliminate these firms' FX risks. Finally, convergence to the euro area may also play a role on both the demand and supply sides.

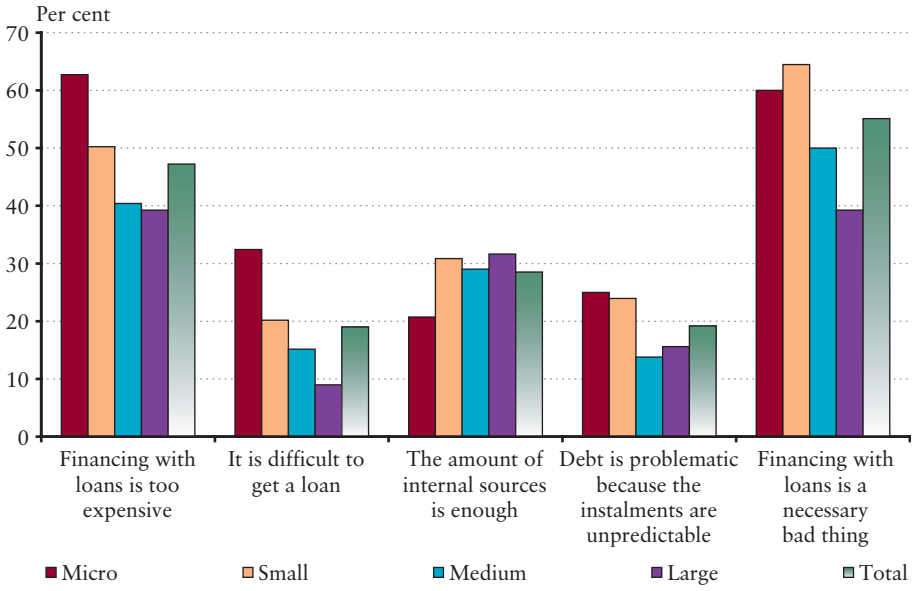
Finding 3 Firms with FX loans are less liquidity constrained and they are in a better financial position than HUF debtors.

In the survey, a few questions were asked about the enterprises' liquidity constraints which can also be used to explain motives behind FX indebtedness. Four potential factors were examined: costs of financing, availability of loans, availability of external sources and predictability of repayment. Finally, we asked whether enterprises think that becoming indebted is a necessary bad thing or rather a useful tool. Based on the answers, enterprises basically think that raising debt is expensive,[16] and this causes problems for almost half of the enterprises. Of the respondents, 20 per cent think that it is difficult to get a loan or that the repayment ratios are hard to predict. However, there is a marked difference between small and large enterprises in respect of all questions. It is worth highlighting that still more than 30 per cent of micro enterprises think it is difficult to raise a loan. The ratio of enterprises who do not need loans as they have enough internal sources to finance their activity is 30 per cent. Finally, more than one-half of the enterprises think that raising a debt is rather a necessary bad thing, and the ratio is above 60 per cent in the case of small and micro firms. Based on this, it seems that liquidity constraints are more severe in the case of small firms, which is in line with theory.

[16] It should be mentioned that according to research on the Hungarian debt market, interest rate margins are the smallest in the corporate debt market, which is close to perfect competition. See for example Móré–Nagy (2004).

Chart 10

Opinion of enterprises on different statements in connection with loans



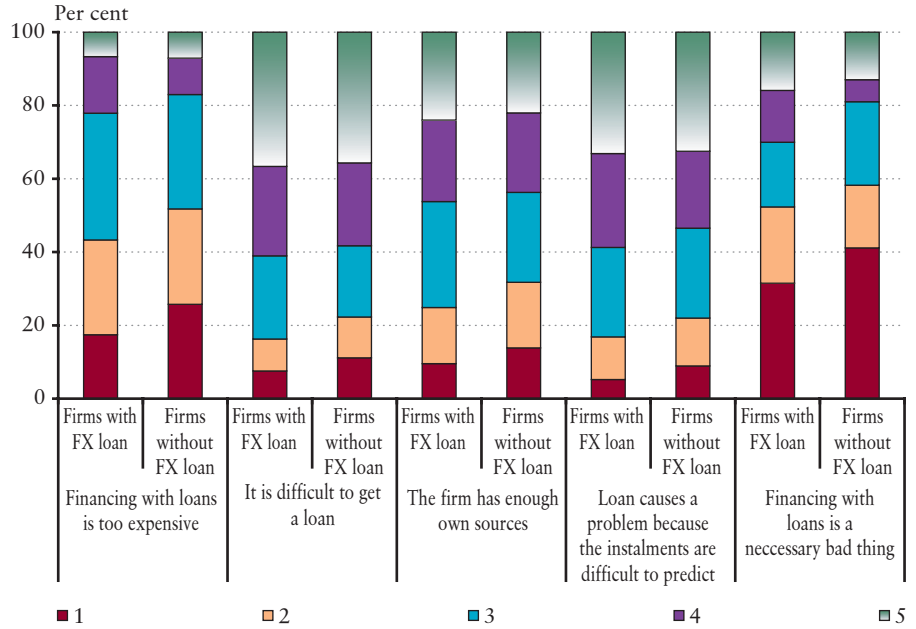
Note: interviewees were asked to rank the statements on a 1 to 5 scale, 1 meaning the statement is not characteristic of them at all, 5 that it describes their situation fully. The chart shows the ratio of firms giving 4 and 5 marks to the different statements.

Source: survey, attitude questions.

In respect of liquidity constraints, there is some difference between FX debtors and the rest. Among FX debtors there are fewer enterprises which think being indebted is extremely costly, that raising a loan is very difficult or that it is a necessary bad thing (Chart 11). Thus, FX debtors feel less liquidity constrained from these aspects than their counterparts. Nevertheless, it is not clear whether FX debt resulted in this or if FX debtors are those enterprises which were originally less liquidity constrained anyway.

Chart 11

Opinion of enterprises on different statements in connection with loans



Note: interviewees were asked to give a mark to the statements, 1 meaning they totally agree, and 5 meaning they do not agree with it at all.

Source: survey, attitude questions.

FX debtors and HUF debtors may also differ in terms of their profitability, indebtedness and exchange rate expectations. If firms with FX debt are in a better financial position, that may reflect that they have more room for manoeuvre in the case of exchange rate changes, and thus may decrease the risks of FX lending. Accordingly, it can help in judging the lending decisions of the bank. In the event that FX lending contributed to an easing of liquidity constraints, then it is possible that firms which borrow in FX are more indebted than firms which do not. In this case, FX loans increase financial stability risks. And finally, by examining the exchange rate expectations it can be revealed if moral hazard problems played a role in firms' borrowing decisions.

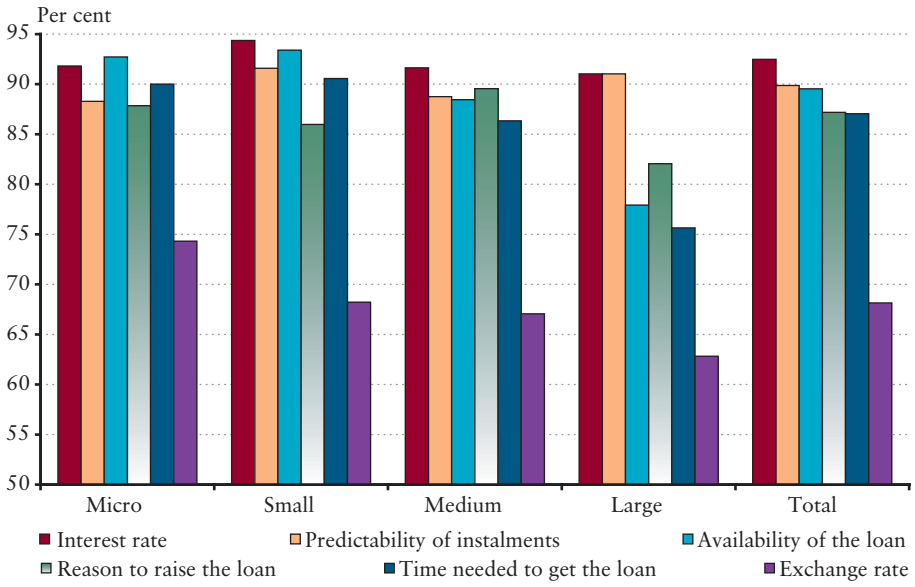
In the case of profitability, I used both accounting profits and attitude questions. The accounting profit ratios do not correlate with the assessment of the respondents on the financial position of the firm. On the basis of attitude questions, enterprises without FX loans are in a worse financial position on average than enterprises with FX loans. Indebtedness is measured as the ratio of debt and the balance sheet total, and it does not differ between firms with or without FX debt. Finally, exchange rate expectations for end-2007 were asked in the questionnaire, but the answers did not correlate with FX indebtedness.

Finding 4 Many FX debtors disregard risks, but on the other hand, firms without FX debt are not necessarily more risk aware and cautious than firms with unhedged FX debt.

Several questions were asked to capture the risk awareness of firms with and without FX debts. First, firms were asked to order the main factors that play a role in loan decisions. Although all factors listed in the survey were considered important or very important by most of the respondents, the interest rate is considered the most important factor. It is followed by the predictability of repayment amounts and the availability of loans. The exchange rate is significantly less important than other factors, with 10 per cent of respondents thinking it was not important at all. One surprising finding is that the ratio of those who think exchange rate is important decreases with firm size, together with the availability and time needed to receive a loan. This can be probably explained by the fact that large enterprises use debts more for hedging purposes, or that they have much more room of manoeuvre than small enterprises, and can choose the denomination and source of a loan more easily than smaller firms. These results are in line with the previous survey,[17] with the exception of the relationship between the relative importance of the exchange rate and being an FX borrower. This survey reflects that significantly more enterprises ascribe importance to exchange rates if they raise FX loans than if they do not have FX debt. This is probably a consequence of the higher exchange rate volatility.

Chart 12

Relative importance of different factors in loan decisions by firm size



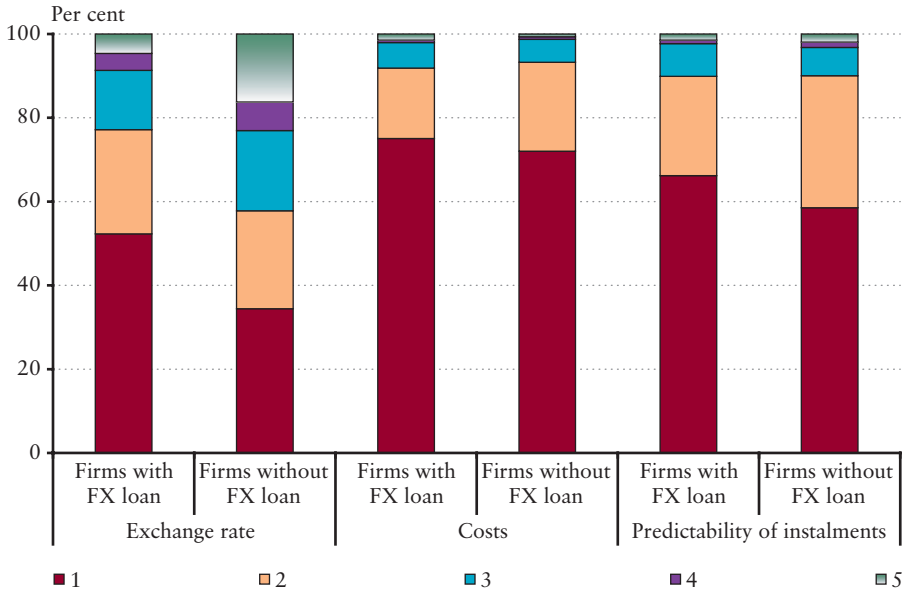
Note: interviewees were asked to give a mark to the factors, 1 meaning it is not important at all, and 5 meaning it is very important. The chart shows the ratio of those firms who gave 4 and 5 marks to the different factors.

Source: survey, attitude questions.

[17] Nevertheless, it is not totally comparable since in the 2005 survey this was measured differently.

Chart 13

Importance of loan characteristics in loan decisions of enterprises with and without FX loans



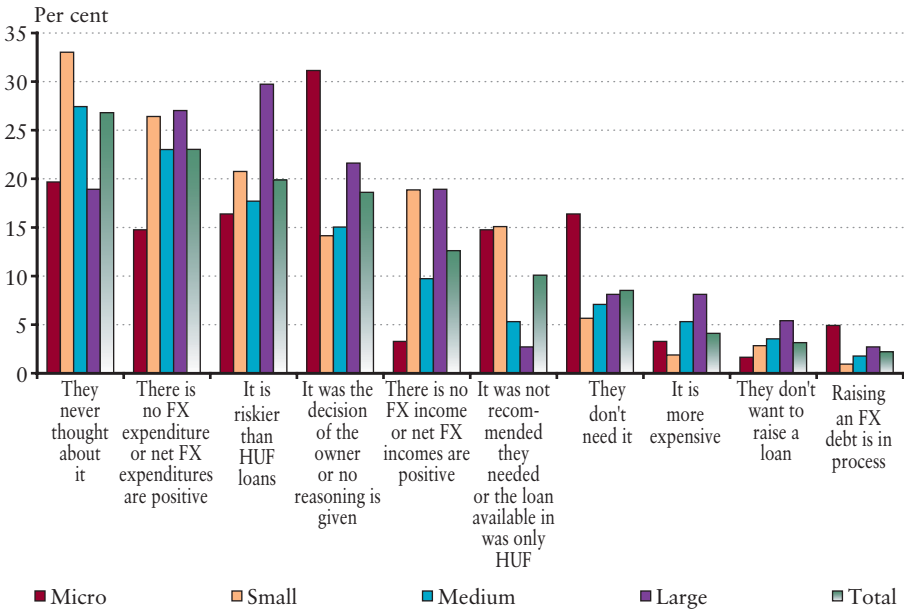
Note: interviewees were asked to give a mark to the factors, 1 meaning it is not important at all, and 5 meaning it is very important.

Source: survey, attitude questions.

Based on the interviews, it seemed important to ask enterprises about their motives not to raise FX debt. This is explained by the finding that in several cases enterprises which would benefit from having an FX loan do not use this opportunity. This is reflected by the results: when asked about the motives not to have FX debt, 25 per cent of enterprises stated that they had not even thought about it. In 22 per cent of the answers the parent company made the decision or there was no reason given at all, while another 10 per cent stated that they did not need a loan or that they had decided not to raise a (bank) debt. The ratio of these answers is highest among micro enterprises.

Chart 14

Motives not to raise FX debt



Note: interviewees could mention more than one reason, the answers were classified afterwards. The chart shows the ratio of enterprises who mentioned the different factors.

Source: survey, attitude questions.

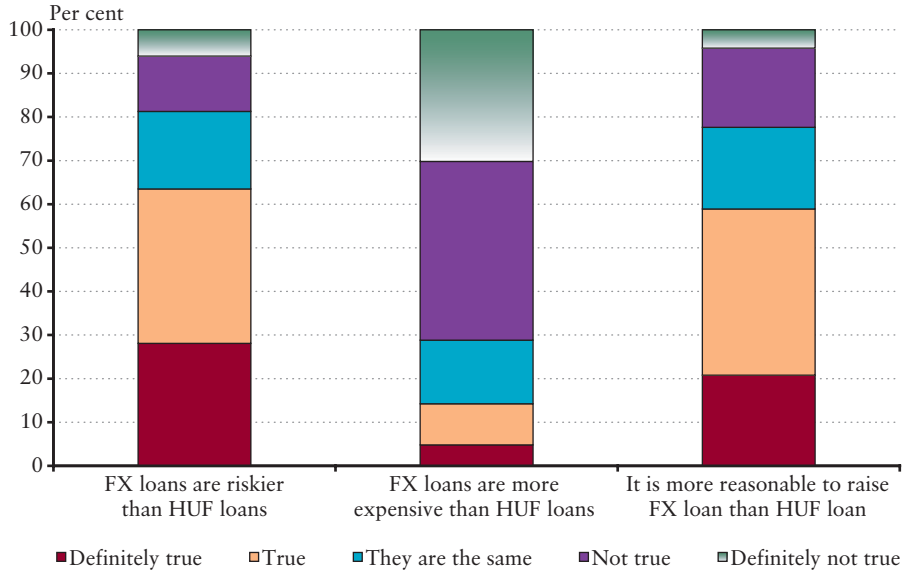
On the other hand, 18 per cent of enterprises consciously decided not to take on the exchange rate risks of FX loans and 12 stated that they had no FX income, or that FX expenditures were higher than FX incomes. Together, 19 per cent of the enterprises (as a ratio of those who did not have FX loans; it amounts to 10 per cent of all firms in the sample) gave at least one of the above reasons as an explanation for not having an FX loan; they seem to be aware of the risks of raising a naturally unhedged FX loan. Nevertheless, here again it appeared that several enterprises think the purpose of an FX loan is to finance FX expenditures: one-fifth of the respondents explained not having FX debt by not having any FX expenditure, even if they had FX income.

Using pairs of statements, we examined the way enterprises think about FX loans and their risks. One pair of statements compared the risks of the two loans, another the price and the third one was the combination of the two where respondents were asked about which one is worthwhile to raise. Based on the answers, almost two-thirds of the enterprises think that FX loans are more risky than HUF loans and the ratio of those who think that FX loans are cheaper is a little larger. Finally, 60 per cent stated that it is more reasonable to have FX debt than HUF.

The only question of the above three where there was a significant difference among size categories was the one on the riskiness of FX loans: the ratio of respondents which think that FX loans are riskier than HUF loans increases with firm size. Thus, there are less micro and small enterprises which are aware of the risks of FX loans; this, however, may be related to the results that the ratio of firms with FX loans also increases with firm size. There are less micro enterprises with experience with FX loans or which had ever thought about comparing its risks with those of raising debt in HUF.

Chart 15

Comparison of FX and HUF loans

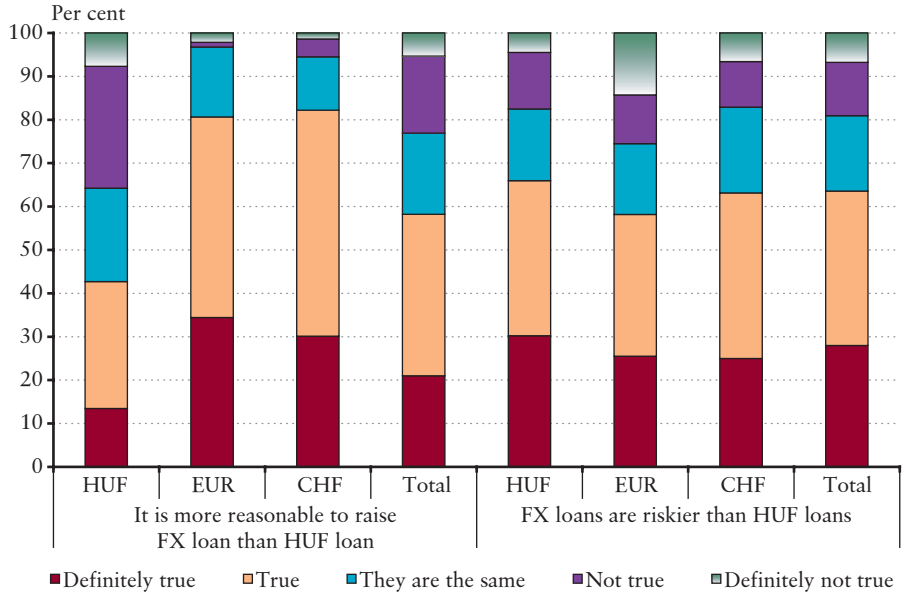


Source: survey, attitude questions.

Finally, it is interesting to examine the risk awareness of firms with loans of different denominations. If enterprises are rational and make their decision taking risks into consideration, there should be no difference between their thinking. On the other hand, if there are fewer firms with FX loans which think FX loans are risky, that might point to an underestimation of their risks. Firms in the sample seem to be rational by this definition, since there is only a slight difference among them by groups of denomination of loans. On the other hand, the majority of enterprises with EUR or CHF loans seem to be content with their decisions since a great majority of them think it is worthwhile to have FX debt, more than to have HUF debt. Enterprises with HUF loans, on the other hand, are more divided: only less than half of them think that HUF loans are more reasonable to raise than FX loans.

Chart 16

Comparison of FX and HUF loans in groups of firms by denomination of the largest loan



Source: survey, attitude questions.

4.3.3 Exchange rate exposure

The results of the previous survey showed that a significant ratio of enterprises is directly exposed to exchange rate changes. That is, they have an open position in their balance sheet or their income statement. Exchange rate exposure has several other sources, but this is the most easily measurable. Indirect effects, i.e. effects of exchange rate changes on demand or competition, can hardly be measured. In the current survey (similarly to the case of FX loans), we included questions in the attitude part of the questionnaire to ask enterprises whether the denomination of their assets and liabilities or incomes and expenditures differed. We also asked firms to give detailed data in the data sheet about the exact denomination of these amounts.

Finding 1 Most firms are exposed to exchange rate changes, though only a few are aware of this.

Based on the attitude questions, 46 per cent of the enterprises are directly exposed to exchange rate changes. Flow exposure (different denomination of income and expenditures) is more frequent: 44 per cent of the enterprises have this type, while 34 per cent of the respondents had stock exposure (different denomination of assets and liabilities).

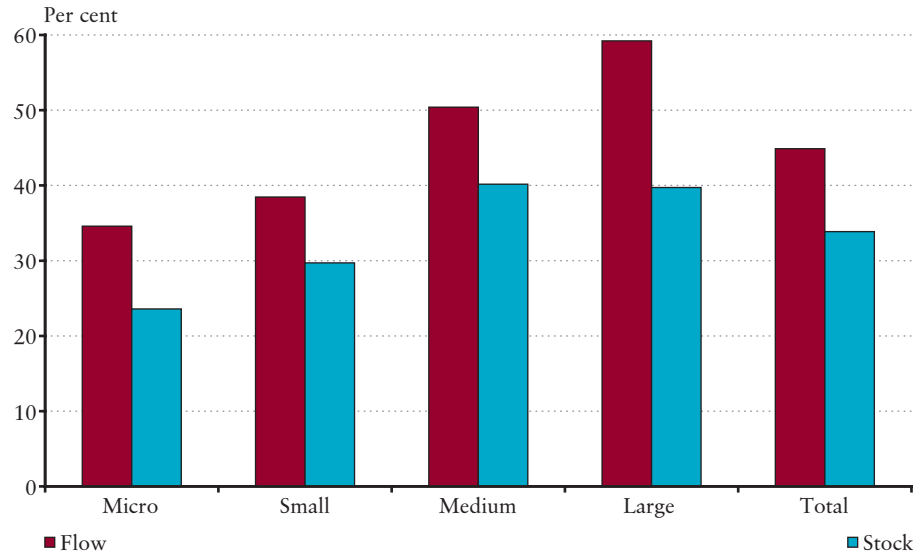
Based on the data that respondents gave in the data sheet, however, there is detailed information only about part of the exposure (Chart 18). 62 per cent of the enterprises that indicated having flow exposure in the attitude questions and 74 per cent of those that indicated having stock exposure did not give information on the denomination structure of the financial data. Nevertheless, there were some firms where the respondent of attitude questions stated they had no FX exposure, while based on the data, they had some: thus, they were not aware of this exposure. The ratio of these enterprises is the highest in the case of stock exposure.[18] Surprisingly, the ratio of enterprises where information based on attitude questions and calculations differ, does not decrease with size.

Due to the large ratio of enterprises which did not give detailed data, the information on FX exposure is biased. If this error is independent of the sign of the exposure, i.e. enterprises which had negative and positive exposure were similarly willing or unwilling to supply detailed data, the data we collected is biased towards zero. I assume that this is the case.

[18] This may be related to the fact that firms have to state their export revenues in their profit and loss statement, while in the balance sheet there is no compulsory item that must be reported in a denomination breakdown.

Chart 17

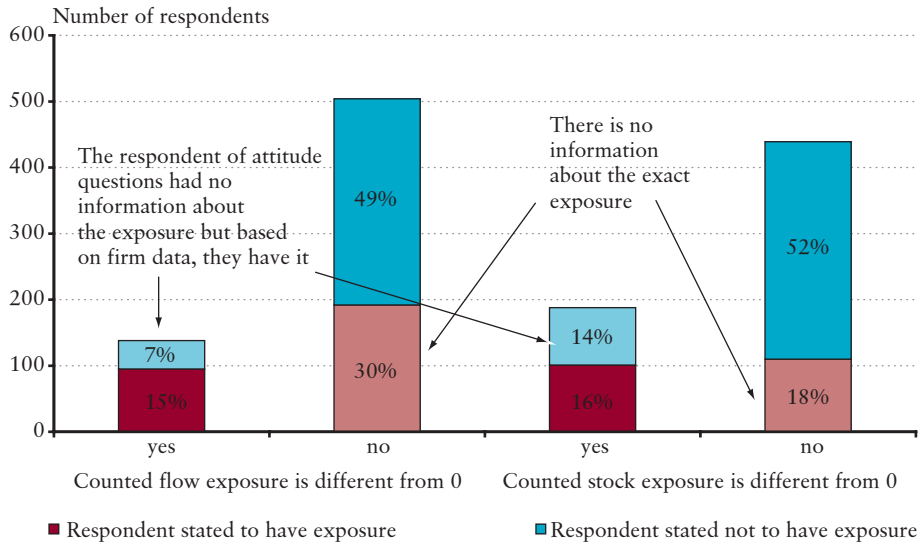
Ratio of firms who stated that the denomination structure of their income and expenditure (flow exposure) or assets and liabilities (stock exposure) differs



Source: survey, attitude questions.

Chart 18

Exchange rate exposure based on respondents' answers and calculations from their data



Note: the following attitude question was posed to the enterprises: "At your firm does the denomination of income and expenditures (flow exposure)/assets and liabilities (stock exposure) differ?" Counted cash flow is calculated on the basis of data given by the respondents.

Source: survey, attitude questions and data sheets.

Another factor causing the data collected in the survey to be biased towards lower exchange rate exposure is that firms usually 'forget' to consider contracts with domestic partners where prices are fixed or paid in foreign currencies (mainly in euro). In the survey, we asked if enterprises had such contracts. 60 per cent of enterprises stated that they had this kind of contracts, while 40 per cent have contract(s) with prices fixed or paid in foreign currency with both customers and suppliers. Among the firms which stated that they had such contracts at least on one side, 70 per cent stated that they did not have any flow exposure. 81 per cent of those who have contracts with customers where prices are fixed or paid in foreign currencies, did not report having FX income. On the expenditures side the ratio is even bigger: 87 per cent. Nevertheless, since there is no

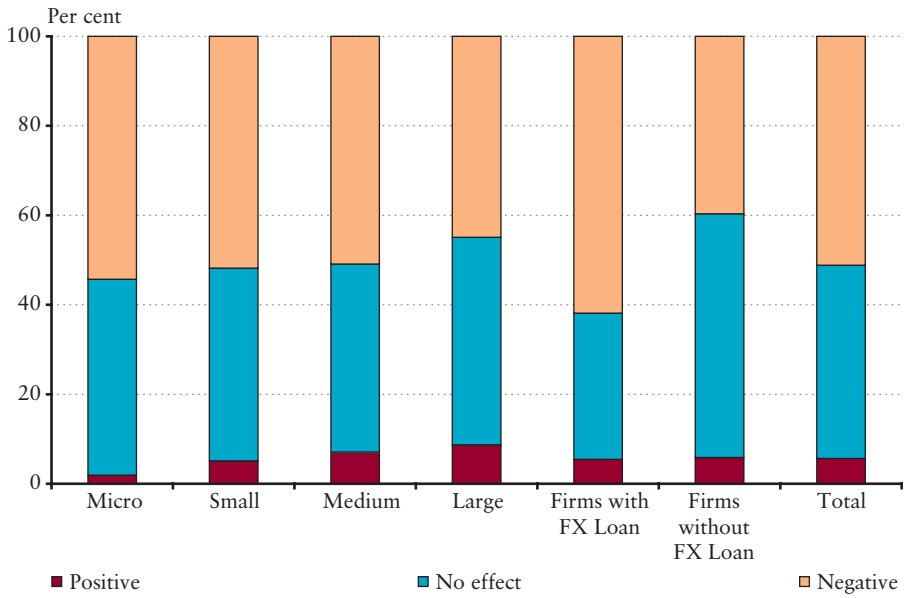
database on the denomination structure of the balance sheet and the profit and loss account, I have used the data from the questionnaires to calculate exchange rate exposure, even if it seriously underestimates the real exposures. Still, it should be highlighted that enterprises usually ignore the exchange rate exposure they have because of these contracts.[19]

Finding 2 More firms expect negative effects from depreciation of the forint and its higher volatility than from its appreciation

Similarly to the previous survey, I also examined the expectations of enterprises in respect of exchange rate changes. Enterprises were asked about the potential effects of increased exchange rate volatility and also about a sustained depreciation or appreciation of 10 per cent. Among the three questions, the highest ratio was found for enterprises which expected a negative effect in the case of depreciation: 58 per cent of respondents think they would be hit by this. 51 per cent of respondents expect a negative effect from higher exchange rate volatility and 23 per cent from forint appreciation. Thus, the perceived exchange rate exposure is asymmetric on the aggregate level. At the firm level, it seems more symmetric than it was in the previous survey: those enterprises which expect negative (positive) effect from depreciation think that appreciation would positively (negatively) affect them. Nevertheless, 9 per cent of the respondents thought that both appreciation and depreciation would affect them negatively.

Chart 19

Expected effects of exchange rate volatility



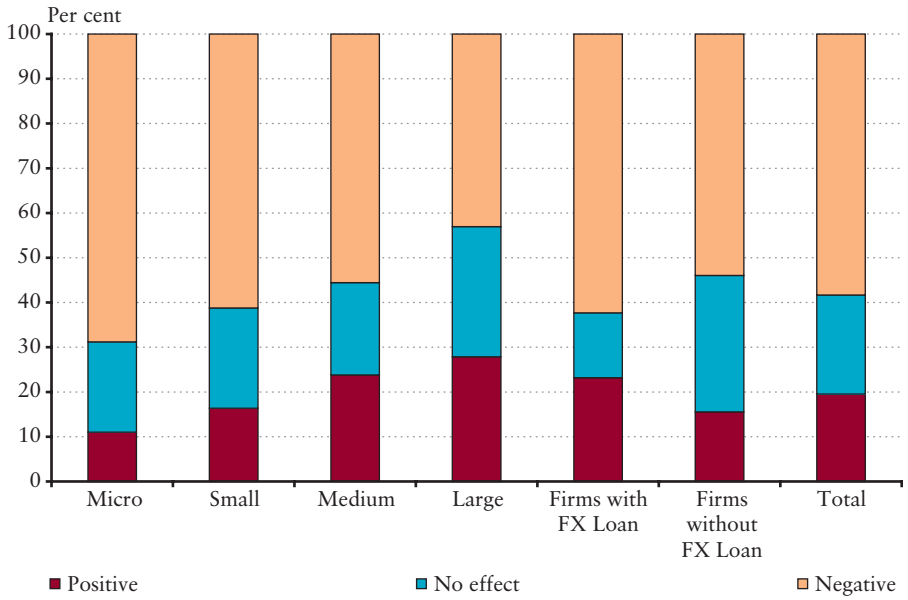
Source: survey, attitude questions.

It is worth mentioning that – as opposed to the 2005 survey – there is a noticeable difference between enterprises with and without FX debt. Enterprises with FX debt expect more severe effects from any exchange rate change than those without it. Nevertheless, among firms with FX loan, there are more firms which expect negative and which expect positive effects from an exchange rate change of any direction. It is only increased exchange rate volatility where the ratio of those expecting a negative effect is significantly higher among enterprises with FX loans.

[19] There are also examples where large enterprises fix prices in forint with smaller companies, even if it would be beneficial for the large company to have natural hedging. The motivation behind this can be that the larger enterprises can use other FX risk management tools more easily.

Chart 20

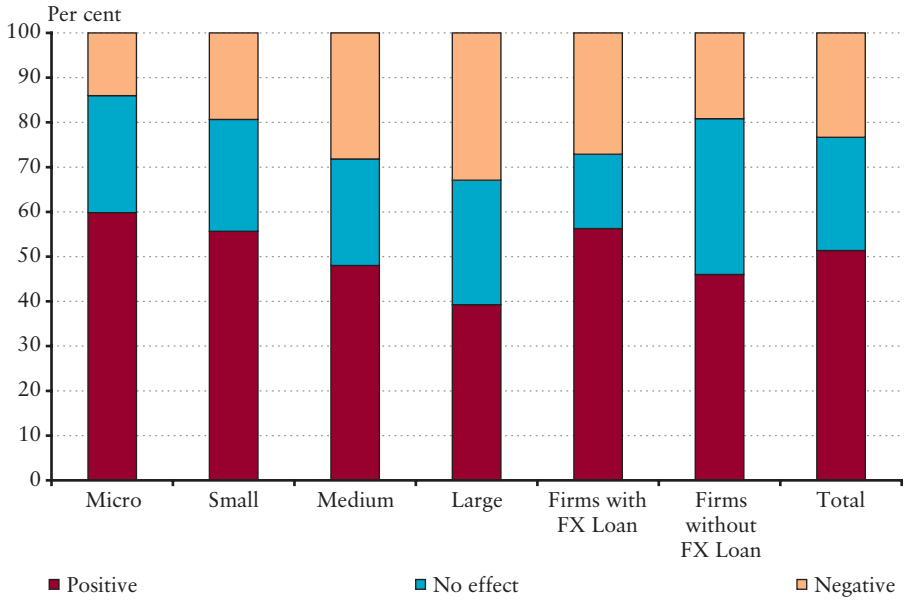
Expected effects of a 10-per cent depreciation of the forint



Source: survey, attitude questions.

Chart 21

Expected effects of a 10-per cent appreciation of the forint



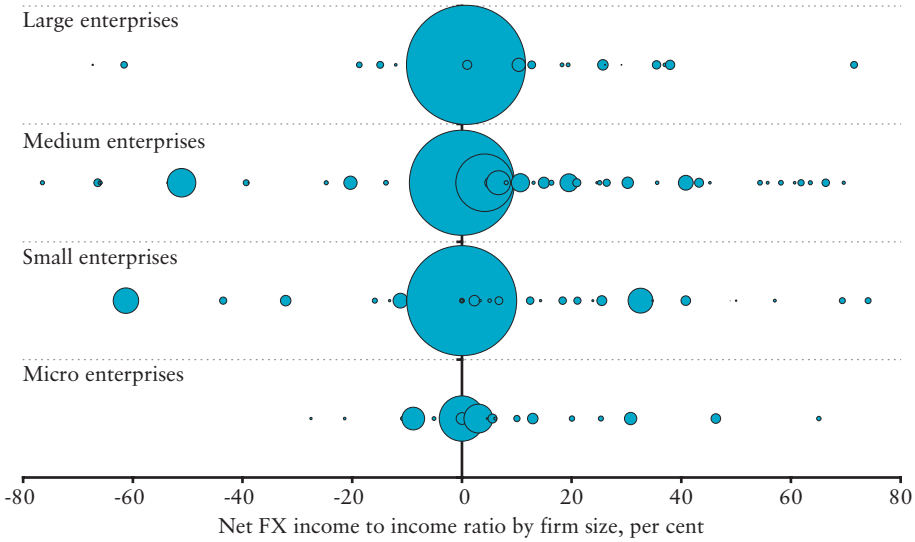
Source: survey, attitude questions.

Finding 3 Although based on aggregate results depreciation of the forint would have a positive effect on the corporate sector, the ratio of loss-making firms would increase more in case of depreciation.

Usually there is information on exchange rate exposure only on the aggregate level. Given that the survey provides micro-level information, it is worth examining if aggregate and micro-level indicators of the exchange rate exposure reflect the same developments. Thus, first I analyse aggregate data for the sample enterprises (sum of stock and flow exposure), and then examine the effects of potential exchange rate changes on firm-level profitability.

Chart 22

Net FX income to income ratio by firm size



Note: bubble sizes reflect the income ratio of firms in the given category to the sum of income of all firms in the sample
Source: survey, data questions.

Based on the aggregate data, *stock exposure* is positive in the sample (the sum of FX assets are larger than that of FX liabilities in the sample). Nevertheless, there are differences by firm size. In the case of SMEs, FX financial liabilities exceed FX financial assets, while stock exposure is positive in the case of large firms. Thus, HUF depreciation would affect the profitability of SMEs negatively through stock exposure, while it would have a positive effect on the profitability of the large enterprises as a whole.[20] As far as *flow exposure* is concerned, the aggregate picture is positive net FX income: FX incomes on average are higher than FX expenditures and the ratio of enterprises with positive net FX income is also higher. Only micro enterprises have negative net FX income on the aggregate level. Thus, the results suggest that HUF depreciation would positively affect the profitability of larger enterprises, while the aggregate profitability of micro enterprises would decrease.

Similarly to the previous survey, the potential effects of exchange rate changes on the ratio of loss-making firms in the sample were examined. Based on data on net FX income and net FX assets, I examined the effect of depreciations and appreciations on profit before tax and calculated the ratio of loss-making enterprises. The advantage of this indicator as compared to the weighted average profitability indicator is that it is more closely related to the creditworthiness and the portfolio quality of loans. If exchange rate changes increase the variance of individual profitability indicators, these differences may disappear in an average variable. Nevertheless, it can be postulated that firms with negative profitability will find it harder to repay their loans, and thus this ratio is more closely related to the financial soundness and creditworthiness of the corporate sector.

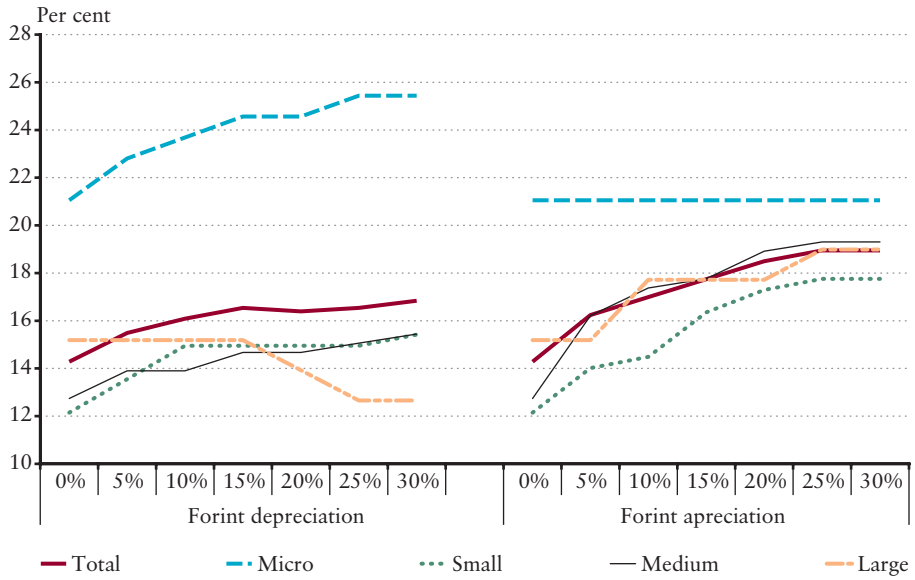
For the calculations, several simplifications were made: exchange rate changes were considered to be permanent and I assumed that neither the behaviour of enterprises nor the behaviour of consumers and other firms change. This assumption results in a potential over-estimation of the risks. For those enterprises which said they are managing their exchange rate exposure and do this using natural hedging or derivatives, I postulated that they are successful in eliminating the effects of exchange rate changes, and thus they had no exposure. Moreover, the behaviour of the economic actors might seriously change in case of a significant exchange rate change, usually leading to non-linearities in the relationships between indicators. For this I cannot control. These latter limitations in the examination lead to an under-estimation of the risks of exchange rate changes or imply that the results are valid only for small exchange rate changes. As a whole, given the limitations of the calculations, the results have to be interpreted with caution.

According to the calculations, it is only micro enterprises where depreciation has a larger negative effect than appreciation in terms of the effect of exchange rate changes through flow exchange rate exposure. In the case of large enterprises,

[20] Due to differences between firms, the effect on total profitability can be different, as it can be seen later in this chapter.

Chart 23

Ratio of loss making enterprises at different depreciations and appreciations – effect of flow exposure



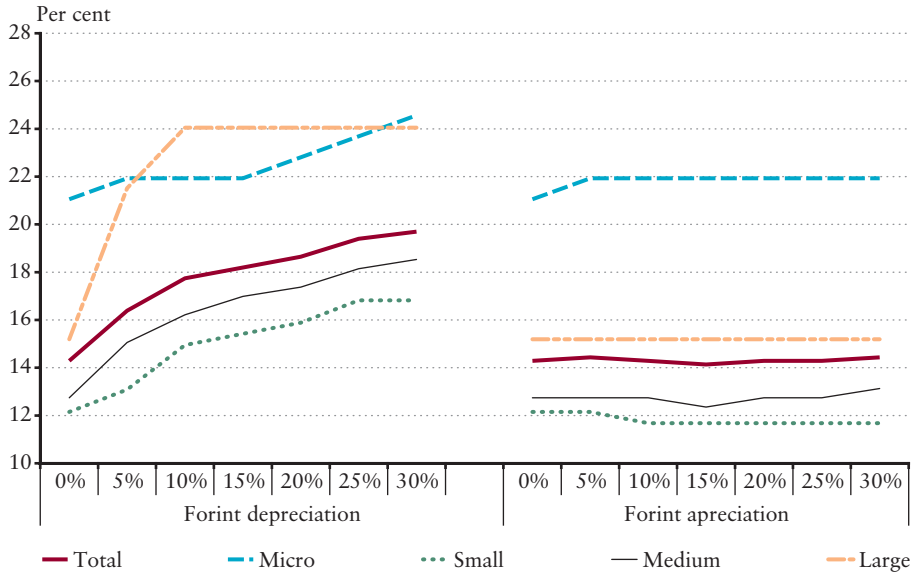
Note: for enterprises which hedge using derivatives or natural hedging tools, the exchange rate exposure was considered zero.
Source: survey, financial statements, own calculations.

depreciation has a significant positive effect: the ratio of loss-making firms drops to a large degree. This is in line with intuition and the previously seen results: the ratio of enterprises with negative flow exposure is the highest among micro enterprises in the sample.

On the other hand, the effect of exchange rate changes through stock exposures is the opposite: the ratio of loss-making firms in the sample increases steeply as a result of depreciation in all size categories, while forint appreciation only has a small effect

Chart 24

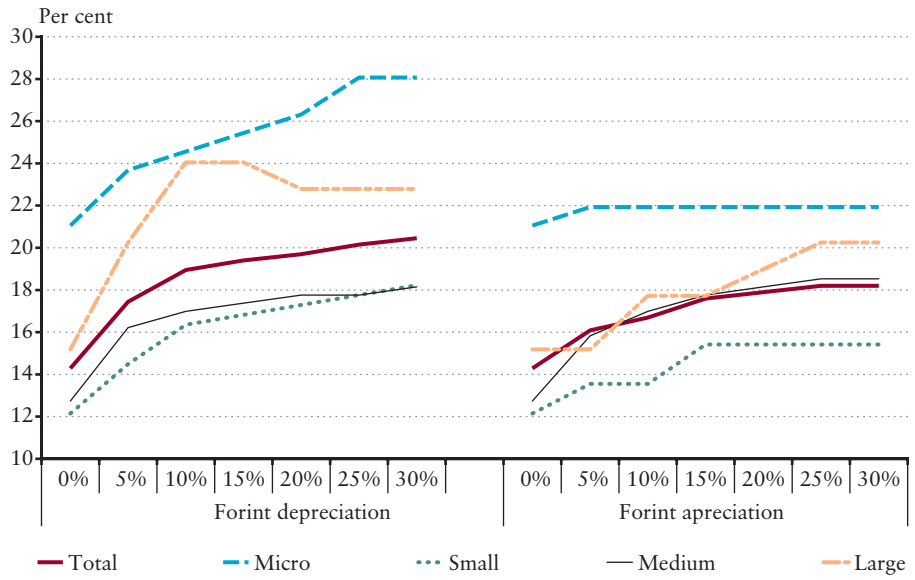
Ratio of loss making enterprises at different depreciations and appreciations – effect of stock exposure



Note: for enterprises which hedge using derivatives or natural hedging tools, the exchange rate exposure was considered zero.
Source: survey, financial statements, own calculations.

Chart 25

Ratio of loss making enterprises at different depreciations and appreciations – common effect from stock and flow exposures



Note: for enterprises which hedge using derivatives or natural hedging tools, the exchange rate exposure was considered zero.
Source: survey, financial statements, own calculations.

(Chart 24). It is worth highlighting that the largest effect was measured for the large firms, a result which is most in contrast with the exchange rate exposure measured through aggregate figures.

By simply adding the two effects, there is a negative effect from any exchange rate on the aggregate level change: a 10-per cent depreciation decreases the overall profit before taxes-to-balance sheet ratio by 1 percentage point, while a 10-per cent appreciation increases it by 1 percentage point. Nevertheless, the ratio of loss-making firms, as before, does not change symmetrically (Chart 25): a 10-per cent depreciation raises the ratio of loss-making enterprises from 14 per cent to above 20 per cent, while in the case of a 10-per cent appreciation the increase in the ratio of loss-making firms is only 3 percentage points. There is obvious non-linearity in both cases: the marginal effect of a small initial exchange rate change is larger, resulting from the fact that there are many firms that operate with a slightly positive profit. In the case of large enterprises, after a steep increase, a forint depreciation above 15 per cent reduces the ratio of loss-making firms, since the positive effects of the depreciation on net FX income start to be effective from then.

The same exercise was carried out for those enterprises which are indebted to the banking sector. For these enterprises, the effects of exchange rate appreciation and depreciation were basically the same as for the whole sample. For micro enterprises which are indebted to the banks, however, depreciation had a more severe effect, while forint appreciation affected large enterprises to a greater degree. The ratio of loss-making enterprises in this sub-sample increased from 13 per cent to 20 per cent in case of a 30-per cent depreciation (reaching 18 per cent already after a 10-per cent depreciation), while the same degree of appreciation resulted in an increase in loss-making firms to 17 per cent. Thus, unexpected, long-lasting exchange rate changes can seriously influence banks' portfolio quality.[21]

Taking the effect of the exchange rate depreciation on the volume of FX loans and on the ratio of loss-making enterprises, the exposure of the banking sector towards loss-making enterprises would increase significantly as a result of exchange rate depreciations would significantly increase, while it does not react to exchange rate appreciations. Concretely, a 30 per cent depreciation of the forint would result in a 35 per cent increase of the banking sector's exposure towards loss-making enterprises in the sample. Thus, unexpected, long-lasting exchange rate changes can seriously influence banks' portfolio quality. However, since the portfolio quality indicators are not available by size category or industry (or the available ones

can only be used with serious limitations), the potential effects can be calculated very imprecisely, the above mentioned figure cannot be considered as representing the effect of exchange rate changes for the banking sector as a whole.

4.3.4 FX risk management

One of the aims of this survey was to examine the factors behind the low ratio of enterprises that hedge their exposures. Thus, several questions were posed to the enterprises about their familiarity with different tools and their usage, or reasons for not using these tools.

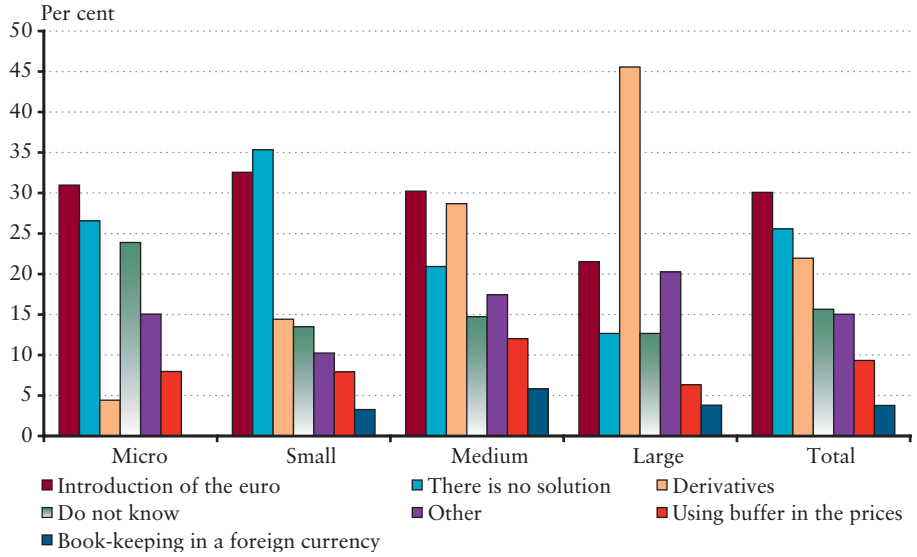
Finding 1 Enterprises expect external solutions to decrease their FX risks.

Respondents were asked to mention tools that they think could help decrease FX risk or its costs (this was an open question). The most frequent answers were the introduction of the euro and that 'there is no solution'. Thus, around two-thirds of the respondents expect external 'help' or do not see any solution to lowering FX risks. 22 per cent of enterprises think derivatives could be used for risk management, and the ratio of these enterprises increases steeply with firm size: only 5 per cent of micro enterprises mentioned this, while 45 per cent of large firms did so. Another quite popular solution is to try to set prices so that they contain some buffer for possible changes or to fix prices in foreign currency with trading partners. And finally, a few enterprises think that by keeping books in foreign currency (a tool available only for entities which have the majority of their income and expenditure in one given currency) exchange rate risks can be decreased.

Another question generated similar results: respondents were asked what they thought about the degree of risk reduction that could potentially be reached using the available tools. 30 per cent of enterprises stated that risk cannot be reduced, with a marked difference between firm size categories. Larger enterprises are more confident about the available risk management tools.

Chart 26

Distribution of answers to the question: "What can you mention as a possible solution to decrease FX risks?" by firm size



Note: based on an open question.

Source: survey, attitude questions.

Finding 2 Although firms expected depreciation and they expected it would negatively influence them, only a small fraction use real FX risk management tools.

Similarly to the previous survey, I also examined the expectations of enterprises in respects of exchange rate changes. Enterprises were asked about the potential effects of increased exchange rate volatility and also about a sustained depreciation

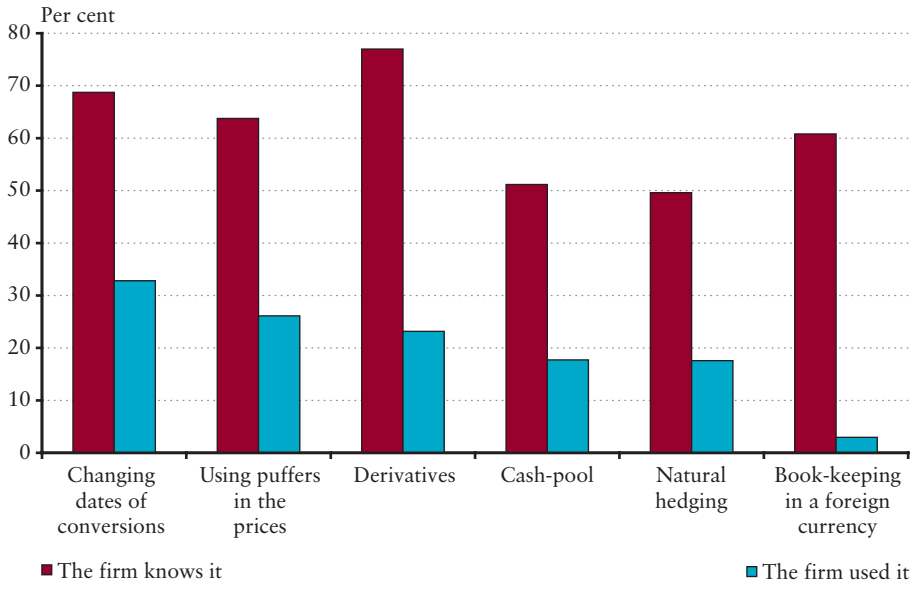
or appreciation of 10 per cent. Among the three questions, the highest ratio was found for enterprises which expected a negative effect in the case of depreciation: 58 per cent of respondents think they would be hit by this. 51 per cent of respondents expect a negative effect from higher exchange rate volatility and 23 per cent from forint appreciation. Thus, the perceived exchange rate exposure is asymmetric on the aggregate level. At the firm level, it seems more symmetric than it was in the previous survey: those enterprises which expect negative (positive) effect from depreciation think that appreciation would positively (negatively) affect them. Nevertheless, 9 per cent of the respondents thought that both appreciation and Similarly to the previous survey, I also examined the expectations of enterprises in respects of exchange rate changes. Enterprises were asked about the potential effects of increased exchange rate volatility and also about a sustained depreciation or appreciation of 10 per cent. Among the three questions, the highest ratio was found for enterprises which expected a negative effect in the case of depreciation: 58 per cent of respondents think they would be hit by this. 51 per cent of respondents expect a negative effect from higher exchange rate volatility and 23 per cent from forint appreciation. Thus, the perceived exchange rate exposure is asymmetric on the aggregate level. At the firm level, it seems more symmetric than it was in the previous survey: those enterprises which expect negative (positive) effect from depreciation think that appreciation would positively (negatively) affect them. Nevertheless, 9 per cent of the respondents thought that both appreciation and depreciation would affect them negatively.depreciation would affect them negatively.

First, enterprises were asked questions on their awareness of the potential volatility of the exchange rate. 77 per cent of enterprises think that exchange rate changes cannot be forecasted at all or only with very great uncertainty. As far as exchange rate expectations are concerned, in June-October 2007 the majority of respondents did not expect high volatility until the end of the year: 40 per cent counted on a stable exchange rate, while 40 per cent forecasted a somewhat weaker forint and 14 per cent projected a somewhat stronger forint. Thus, although respondents were aware of potentially large movements, they did not think it very possible and still anticipated a stable or somewhat weaker forint.

Among those exposed to FX risks, about 55 per cent manage their FX risks in some way. Nevertheless, we asked all enterprises about the tools they have heard of and the ones they have already used. The most well-known risk management tools were derivatives, changing the dates of conversions and using a mark-up in prices to cover potential extra costs. These also were the most frequently used tools, although only a small ratio of enterprises used them in reality. Natural hedge is used by less than 20 per cent of firms, and almost two times as many stated that they could not use natural hedging because of their liquidity problems. Among those who use or have used derivatives, forwards are the most popular, followed with a huge lag by interest rate constructions.

Chart 27

Known and used tools of FX risk management



Note: FX risk management tools were listed on the basis of interviews conducted prior to the survey, 4.1.

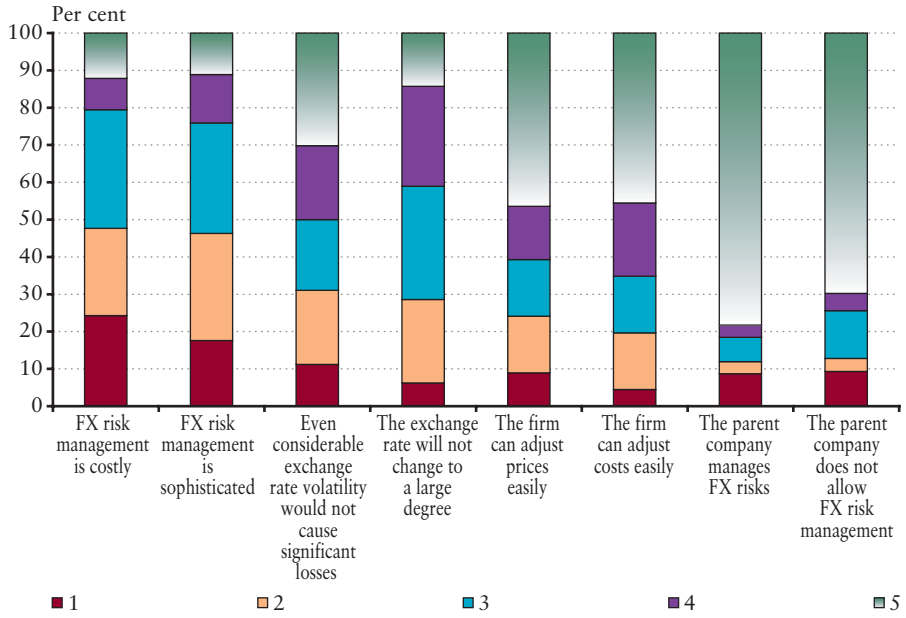
Source: survey, attitude questions.

Finding 3 The main reason for the lack of hedging is that firms think FX risk management tools are too costly or too sophisticated.

Enterprises which are admittedly exposed to exchange rate changes but do not hedge it, were asked to assess 8 statements as to whether they are true for them or not. Based on these, the main reasons for not hedging were the costliness and complicatedness of risk management tools. This is followed by fixed exchange rate expectations and opinions about the small effect of exchange rate changes. Some 20 per cent of enterprises think that they can flexibly adjust prices and the same ratio think they would be able to change costs to avoid losses. More than 10 per cent of enterprises stated that the parent company either does not allow them to manage FX risks or it is done at the parent company in a centralised manner.

Chart 28

Reasons for the lack of hedging



Note: interviewees were asked to give a mark to the statements, 1 meaning they totally agree, and 5 meaning they totally disagree with it.
Source: survey, attitude questions.

5 Econometric analysis

Based on the literature on exchange rate exposure, motives to raise FX debt and using FX risk management tools, I examined a reduced form model. I investigated the relationship between different company characteristics and the aforementioned factors. The examined company characteristics were collected using the empirical literature on these topics. I used probit estimation method for the econometric examination.

To explore the information in both the 2005 and 2007 surveys, I also ran pooled probit estimation. Nevertheless, this examination has a few limitations, given the different structure of the two surveys.

5.1 ANALYSIS OF THE 2007 SURVEY

For the data from the 2007 survey, I examined the following reduced form model:

$$Pr(y=1|x)=f(x),$$

where Pr(y=1) refers to the probability that

- the firm has FX debt (D_devhit), measured by attitude questions;
- the firm has currency mismatch (D_exp), measured by attitude questions;
- the firm uses FX risk management tools (D_fedez), assuming there is exchange rate exposure. It is measured in three different ways:
  - D_fedez=1 if the interviewee stated they hedge their exchange rate exposure;
  - D_fedez1=1 if the interviewee stated they hedge their exchange rate exposure using derivatives or natural hedging;
  - D_fedez2=1 if the interviewee stated they hedge their exchange rate exposure using derivatives.

The explanatory variables are basically the same in the 5 regressions, with the only exception of the equation on being exposed to FX risk.

I used the following explanatory variables:

- size, measured by balance sheet total or size dummies: I posed that larger firms are more likely to raise an FX debt, hedge their exposure or be exposed to exchange rate changes.
- age of the firm: I examined if older firms are more likely to raise an FX debt, hedge their exposure or be exposed to exchange rate changes.
- sectoral dummy: I examined sectoral differences among the enterprises, agriculture and construction industries being the reference group.
- ratio of foreign ownership: I posed that foreign owned firms are more likely to raise an FX debt, hedge their exposure or be exposed to exchange rate changes.
- ratio of export revenue, as a proxy of net FX income (with the exception of the equation on exchange rate exposure): I examined if export firms have a higher probability of raising an FX debt (for natural hedging), and if they are more willing to hedge their exposure since they are probably the most exposed.

- answers to the question on being liquidity constrained:
  - k9a: the answer to the question *"To what degree the following statement is true for your company: For a company like ours, credit is too expensive."*
  - k9b: the answer to the question *"To what degree the following statement is true for your company: For a company like ours, it is very difficult to raise a credit."*
- leverage ratio (debt-to-balance sheet total ratio): I examined whether more leveraged firms have more FX debt and if they have less capacity to do FX risk management.
- ratio of long-term debt to total debt: this is important in the equation on the FX indebtedness, where a positive and significant covariate confirms that firms with long term debt are more willing to raise an FX debt.
- profitability: examined by ROA, profit margin and answers to the survey question k3: *"How do you assess the current financial position of your firm?" (1 meaning very good financial position and 5 very weak)*
- dummy variables on short term exchange rate expectations (with the exception of the equation on exchange rate exposure): I examined whether firms that expect depreciation or appreciation of the forint are more willing to raise FX loan or manage their FX risks.

See the results of the equations with the highest explanatory power for each dependent variable in Table A-1 (Appendix).

The probability of having an FX debt is significantly larger in case of exporting and larger enterprises. Even after controlling for the export revenues, manufacturing firms are more probable to have FX debt. Nevertheless, after controlling for export revenues and sector, the ratio of foreign ownership has no explanatory power. Firms that have long-term debt are also more willing to have FX debt, a result which merits further examination. As far as profitability is concerned, accounting ratios on profitability had no explanatory power at all, while the assessment of respondents on their financial position was related to the explained variable. The age of enterprises is significant only in its quadratic form, and with a negative sign, meaning that the probability of having an FX debt increases with age, but only up to a turning point. The probability to have an FX debt is not related to exchange rate expectations or to leverage ratios.

As far as FX risk management activity is concerned, firm size, the ratio of foreign ownership and export revenues have significant covariates that are basically the same, independently of the specification. Larger companies with more export revenue and a higher ratio of foreign ownership are more likely to use FX risk management tools. Liquidity constraints, profitability and exchange rate expectations play a role, but the significance of the covariates is low in all cases and they are significant only in the 'broader' definitions. The age of enterprises and the sector do not play any role in FX risk management activity.

Finally, as far as the probability to have exchange rate exposure from any source (stock or flow, as reported by the respondents among the attitude questions) is concerned, it is a function of sector, foreign ownership and assessment of the financial position.

5.2 POOLED PANEL ANALYSIS OF THE 2005 AND 2007 SURVEYS

Using pooled panel estimation, I examined whether the probability of having FX debt, to be exposed to exchange rate changes and to use FX risk management tools has changed from 2005 to 2007, after controlling for several firm-specific characteristics. To put it differently, I examined whether the change in the above factors between the two surveys is due to differences in the sample or to other factors. This can be done if the sample of both surveys is a normally distributed, random sample. This examination is carried out exclusively for SMEs, given that large enterprises were excluded from the first survey.

Table 2 shows the description of the dependent variables. The ratio of firms with FX loans, exchange rate exposure and FX risk management activities increased between the two periods, the increase is biggest in the case of FX indebtedness.

Table 2

Dependent variables in the two samples

	Ratio of enterprises with FX loans	Ratio of enterprises with FX loans (modified definition)	Ratio of firms directly exposed to exchange rate	Ratio of firms changes managing FX risk if there is exposure	Total
Survey 2005	14.8%	14.8%	49.3%	26.3%	513
Survey 2007	59.0%	25.4%	62.9%	39.6%	593
Total	38.5%	20.8%	56.6%	34.9%	1106
Number of observations	1106	1106	1106	680	

Nevertheless, it should be mentioned here that the measurement of this variable differed in the two surveys (in the first survey we requested data on the structure of indebtedness, which caused this ratio to be downward biased, while in the second survey we identified firms with FX debt on the basis of the attitude questions). In this case the different identification might cause bias in the estimation, thus to control for these differences, I also performed the estimation by dropping the observations in the 2007 survey where the enterprises stated they had FX debt but did not supply the necessary data on these stocks. As far as FX risk management was concerned, I considered as hedging the use of derivatives and natural hedging. Other hedging tools were not examined.

Table A-2 (Appendix) shows the description of financial variables in the two samples. From the means it can be seen that the enterprises in the second survey are significantly larger in terms of balance sheet total, income and employees. The mean ratio of foreign ownership, export revenues to total revenues and long-term indebtedness is also larger in the 2007 survey than two years before. Surprisingly though, the profitability ratios are much lower, as well as liquidity of the enterprises.

In the estimations, the following dependent variables were used:

- the firm has FX debt, measured in two ways:
  - D_devhit=1 if the firm had an FX debt based on accounting data in the 2005 survey and based on attitude questions in the 2007 survey,
  - D_devhit_2007q=1 if the firm had an FX debt based on accounting data in both surveys, 0 otherwise.
- the firm has currency mismatch (D_exp), measured by attitude questions;
- the firm uses FX risk management tools, where D_fedez1=1 if the respondent stated that it hedges its exchange rate exposure using derivatives or natural hedging.

The explanatory variables are basically the same as in the 2007 survey, if they were available for both surveys. **d_2007** is a dummy variable, equal to 1 for the data of the 2007 survey. If this coefficient is significant, then there is a difference between the two surveys, even after controlling for firm-specific variables. See the results of the estimations in the Table A-3 (Appendix).

Based on estimations, as far as the probability of having an FX debt is concerned, there is a significant increase in it, even after controlling for the company-specific data. Nevertheless, there is no increase if the measurement method is equalised in the two surveys. The main, significant explanatory variables are basically the same as those of the 2007 survey: firm size, export revenues, and in this case foreign ownership are positively correlated with the probability of having FX debt, while the quadratic form of the firm age is negatively correlated. Profitability and the long-term debt ratio were not significant in these estimations.

As far as FX risk management activity is concerned, there is no difference between the two surveys, and thus FX risk management did not improve during the two years between the surveys. As for the firm characteristics, size, foreign ownership and export revenues are positively correlated with the probability of managing FX risks. Surprisingly though, age and profitability do not play a role in explaining this dependent variable.

The probability of having exchange rate exposure increased significantly from 2005 to 2007. This probability is positively related to firm size and foreign ownership, and a negative function of the quadratic form of firm age.

6 Conclusion

On the basis of the literature on financial crises, it can be said that small open economies are exposed to a significant degree to exchange rate changes, and that in emerging countries depreciation often has negative effects. One of the main reasons behind this is dollarisation leading to currency mismatches. As in Hungary, dollarisation of liabilities is increasing not only in the case of large export enterprises but also in the retail sector, and consequently the potential risks need to be examined. To study these risks, a survey was carried out among companies with debt in order to investigate exchange rate exposure, the motives behind FX borrowing and the FX risk management practices and thus collect information on banks' indirect FX risks.

The survey revealed that both SMEs and large enterprises raise FX debt to a large degree, and that FX loans are more dominant among long-term loans and investment loans than HUF debt. The main motivation to choose a foreign currency loan is the interest rate difference, but in the case of large enterprises, natural hedging also plays a role. Nevertheless, several enterprises do not raise FX loans even if this could serve as a natural hedging tool, while others use such loans to finance FX expenditures.

Data on exchange rate exposure are difficult to collect and the data quality collected in this survey is far from perfect. The measured exchange rate exposure is presumably biased towards zero, due to the fact that the majority of enterprises do not keep track of their FX positions or do not report their data. Based on the data received, however, firms are more exposed to exchange rate depreciation than to appreciation, at least as far as the ratio of loss-making enterprises is concerned. Since the effect of exchange rate changes on the average profit ratio of enterprises could be misleading, hiding the distribution of the exchange rate sensitivity, the ratio of loss-making firms is used as a proxy of exchange rate exposure on the aggregate level. Based on these numbers, an unexpected, lasting depreciation would increase the ratio of loss-making enterprises significantly, both in the whole sample and among the debtors of banks.

As far as exchange rate risk is concerned, most enterprises think of it as an external factor that cannot be dealt with. They think a solution to decreasing FX risk should come from an external source, and that FX risks can be decreased only to a small degree using the tools at their disposal, and that the available FX risk management tools are too expensive or complicated.

The credit risk of the banking system may be indirectly derived from the above results. The survey indicated that a shift in the exchange rate can produce an unexpected effect on domestic enterprises through two channels: directly through foreign exchange debt and indirectly through other foreign exchange items. Based on the survey results, more than one-half of the FX loans are at companies which do not have natural hedging. Besides, many enterprises underestimate their foreign exchange exposure and do not apply any conscious risk management techniques. The analysis confirmed, however, that unexpected exchange rate changes would generally adversely affect the SMEs and large enterprises as well, which would increase credit loss of the banking system. These calculations, however, do not take competitiveness and other long-term effects of exchange rate changes into consideration, thus, the results have to be interpreted with caution.

In terms of further research, it would be interesting to examine the motives behind long-term loans being more concentrated in foreign currency debt than domestic currency debt. Furthermore, the degree of dollarisation in contracts with domestic consumers and suppliers, its motives and consequences also merits deeper investigation. From a policy point of view, the exchange rate risk awareness of Hungarian enterprises should be increased in order to decrease the potential unexpected losses of firms.

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Appendix

Table A-1

Results of probit estimations

	D_devhit	D_fedez	D_fedez1	D_fedez2	D_exp
Balance sheet total	0.00* (0.00)	0.00** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00 (0.00)
Age	0.03 (0.03)	0.001 (0.04)	0.004 (0.04)	0.08 (0.05)	0.03 (0.34)
Age*age	-0.002* (0.001)	0.0002 (0.001)	-0.0003 (0.002)	-0.003 (0.002)	-0.001 (0.001)
Industry: manufacturing	0.44** (0.19)	0.34 (0.24)	0.46 (0.31)	-0.26 (0.22)	0.41* (0.21)
Industry: services	0.17 (0.18)	0.33 (0.23)	0.46 (0.31)	-0.17 (0.21)	0.33 (0.21)
Ratio of foreign ownership	0.002 (0.002)	0.003** (0.002)	0.004** (0.002)	0.004** (0.002)	0.01*** (0.001)
Ratio of export revenues	0.01*** (0.002)	0.01** (0.002)	0.01*** (0.002)	0.01*** (0.002)	
Financially constrained 1	-0.07 (0.05)	-0.02 (0.05)	-0.03 0.06)	-0.08 (0.05)	-0.02 (0.05)
Financially constrained 2	0.02 (0.05)	-0.09* (0.05)	-0.07 (0.06)	-0.002 (0.05)	0.03 (0.05)
Ratio of long term debt	0.02*** (0.003)	-0.0001 (0.0003)	-0.0001 (0.0003)	0.00 (0.00)	
Assessment of financial position	-0.19*** (0.07)	-0.13* (0.08)	-0.14 (0.09)	-0.11 (0.08)	-0.28*** (0.07)
Exchange rate expectations: forint appreciation	0.09 (0.17)	0.21 (0.17)	0.21 (0.20)	0.03 (0.19)	
Exchange rate expectations: forint depreciation	-0.01 (0.12)	0.09 (0.12)	0.24* (0.14)	0.07 (0.13)	
Constant	0.78** (0.33)	-0.67 (0.44)	-1.26** (0.54)	-0.71 (0.46)	-0.37 (0.40)
Obs.	627	627	627	627	627
Log likelihood	-354.94	-321.12	-235.01	-300.85	-364.50
Pseudo R2	0.10	0.09	0.14	0.12	0.10

*Note: ***, **, * refer to statistical significance at 1%, 5 % and 10 % level, respectively. Standard errors are in parenthesis.*

Table A-2

Description of variables by survey date

variable	Survey 2005	Survey 2007	Total
Balance sheet total	311 741	2 265 997	1 359 547
Net revenues	429 072	3 210 570	1 920 418
Number of employees	20	58	40
Foreign ownership	9	19	14
Ratio of export revenues	8	12	10
RoA	5	0	2
Profit margin	2	1	2
Leverage	64	77	71
Ratio of long term debt	19	32	26

Note: mean values, firms with less than 250 employees.

Table A-3

Description of variables by survey date

	D_devhit	D_devhit_2007q	D_fedez1	D_exp
Constant	-1.06*** (0.21)	-1.42*** (0.22)	-1.20*** (0.34)	-0.56*** (0.19)
d_2007	1.52*** (0.10)	0.16 (0.10)	-0.01 (0.13)	0.16* (0.09)
Size: small	0.20* (0.11)	0.20* (0.11)	0.29* (0.15)	0.42*** (0.10)
Size: medium	0.26** (0.13)	0.31** (0.12)	0.66*** (0.17)	0.49*** (0.12)
Industry: manufacturing	-0.09 (0.18)	0.004 (0.18)	-0.004 (0.25)	0.43* (0.16)
Industry: services	-0.30* (0.17)	-0.05 (0.17)	0.25 (0.24)	0.17 (0.16)
Industry: construction	-0.34* (0.20)	-0.22 (0.22)	0.18 (0.30)	-0.22 (0.19)
Age	0.02 (0.03)	0.03 (0.03)	0.0008 (0.05)	0.02 (0.02)
Age*age	-0.002* (0.001)	-0.001 (0.001)	0.0001 (0.002)	-0.002* (0.001)
Foreign ownership	0.003** (0.001)	0.01*** (0.001)	0.004** (0.006)	0.007*** (0.001)
Ratio of export revenues	0.01*** (0.002)	0.01*** (0.002)	0.004** (0.002)	
Profitmargin	0.005 (0.003)	-0.0002 (0.002)	0.002 (0.006)	0.005 (0.003)
Profitmargin*profitmargin	0.00002* (0.00001)		-0.0002 (0.0002)	0.00002* (0.00001)
Leverage	0.0001 (0.0002)	-0.00004 (0.0002)	0.0001 (0.002)	-0.0002 (0.0002)
Liquidity	0.00002 (0.00004)	-0.00002 (0.00005)	0.00002 (0.00005)	0.0001 (0.0001)
Obs.	1086	806	616	1086
Log likelihood	-540.17	-362.85	-352.02	-669.49
Pseudo R2	0.27	0.22	0.09	0.10

*Note: ***, **, * refer to statistical significance at 1%, 5 % and 10 % level, respectively. Standard errors are in parenthesis.*

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