

Anca BUTNARIU

„Gheorghe Asachi” Technical University of Iasi

Florin-Alexandru LUCA¹

„Gheorghe Asachi” Technical University of Iasi

Andreea APETREI

Catholic University of Valencia

MITIGATING FINANCIAL RISK BY USING HEDGING STRATEGIES

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Abstract

Financial derivatives are now widely used by corporations to manage exposure to currency, interest rate, and commodity price risks. The motivation for non-financial firms to engage in corporate hedging is one of the most intensively discussed topics in corporate finance research. Recent financial theory suggests that there are several ways through which corporate hedging can increase firm value in the sense of the maximization of shareholder value. A rich body of literature consists of studies that have empirically investigated the theoretical explanations for corporate hedging, literature that presents rather mixed evidence for the drivers of corporate hedging. This paper investigates the effects of hedging activity on non-financial firm value and how operational hedging is related to and differentiated by financial hedging, by providing an extensive overview and synthesis of the existing literature.

¹ Corresponding Author

INTRODUCTION

The first step in any risk management activity is the identification and assessment of risk exposure. Firms are exposed to a portfolio of risks, some of which are firm-specific whereas the rest are inherent to capital markets and common to all firms in the economy (market risks).

The main objective behind corporate risk management programs is the increasing of shareholder wealth by enhancing firm value through the management of risk exposures (Boyabatli and Toktay, 2004).

Schrand and Unal (1998) show that firms must use diversified risk management strategies depending on the type of risk source. They argue that firms must take opportunities by bearing risk related to activities in which they have a competitive advantage (their core business risk). For example, global manufacturers can justify the risks taken in launching new products and introducing new features in their product lines. But global companies are usually exposed, for example, to currency risk that occurs in the process of raw materials and components acquisition for their products, and also by selling their final products on foreign markets. Non-financial companies are not expected to possess a competitive advantage in trading currencies or interest rates (Kim et al., 2006). It appears that non-financial companies should use risk management strategies that limit their currency and interest rate net exposure by hedging and taking risks on their core business or their area of expertise.

Hommel (2005) also distinguished between two types of risks. The compensated risk is the risk for which the firm receives a premium above the risk-free rate - industrial companies have for example a comparative advantage in taking product market and technology risks, whereas liability risks represent core competencies of financial intermediaries (banks and insurance companies). The hedgable risks are those risks that, if are kept in a firm's portfolio, have effects in the direction of decreasing shareholder value.

Risk manager's decision has to discriminate between keeping certain risks in the company books and managing them directly and passing the risks on to other parties using financial instruments or operational activities.

The corporate finance literature identifies different market imperfections as reasons for the existence of firm-level financial risk management: financial distress and bankruptcy costs, corporate taxes, more costly external financing leading to underinvestment, cash flow volatility and agency problems such as managerial risk aversion and information asymmetry between managers and shareholders (Boyabatli and Toktay, 2004).

MANAGING FINANCIAL RISK BY USING DERIVATIVES

After determining their financial risk portfolio, firms have to tailor their exposures management strategies, by using a significant number of tools. Such financial means could be: taking short or long positions in financial derivatives (forwards, futures, options, swaps etc.), carrying large cash balances, adopting conservative financial policies or holding foreign denominated debt (Boyabatli and Toktay, 2004).

From this range of available tools, **financial derivatives**- contracts written over asset prices such as interest rates, exchange rates and commodity prices, providing risk transfer between the transacting parties, have been preferred at the firm level through well-developed financial markets for a long time in order to manage financial risks. Alternatively, the firm can use **operational hedges**, which stem from the operating and investment activities of the firm, to reduce cash flow uncertainty (Treanor et al., 2013). Investments having real option features are the prevalent instruments used for this purpose. Real options are "opportunities to delay and adjust investments and operating decisions over time in response to resolution of uncertainty" (Triantis, 2005). The value of real options is driven not only by timing (through the postponement of operating decisions) but also by scope (by providing a set of alternatives instead of a single choice) (Billington et al., 2003). Real options are referred to as operational hedging mechanisms in the risk management literature. Operational hedging has been studied in a variety of fields - operations management, finance, strategy and international business, being discussed in conjunction with financial hedging, and mostly analyzed in a multinational context.

The finance literature defines operational hedging as mitigating firms' risks by operational means. Operational flexibility achieved through various operational means (ability to shift production, transferring technologies, product differentiation etc.) and geographical diversification are the operational hedges of firms utilized in conjunction with financial hedges.

Operational flexibility is the major operational hedging strategy discussed in the finance literature. The value-enhancing capability of this kind of flexibility is correlated with its real option features. Even in a risk-neutral setting, creating real option features in an existing investment increases value by providing flexibility in the decision-making process.

The most prevalent type of operational hedging strategy appears in the form of switching production or sourcing locations.

Operational flexibility can be used for a purely value-enhancement motive, it is considered to be an operational hedging strategy only when there is a risk hedging reason for employing it.

Some examples of operational flexibility practices are: a multinational firm locating manufacturing facilities in foreign markets to provide an operational hedge against currency fluctuations; a firm's ability to adjust output and thus cost (Treanor et al., 2013); high levels of intangible assets that provide flexibility in terms of shifting resources among countries or businesses.

Petersen and Thiagarajan (2000) study the operational hedging strategies of gold mining firms, that are subject to commodity risks. These firms, by adjusting their mining strategies as a function of gold price, create cost structures that positively correlate with the price of gold, thus creating operational flexibility, as their operational hedging strategy, and creating a natural hedge against gold price exposure.

In addition to operational flexibility, **geographical diversification** is discussed as another operational hedging strategy in a multinational context. Domestic firms selling to foreign markets can ensure that their production costs and sales revenues are realized in the same currency and are thus exposed to the same exchange rate uncertainty by opening a production facility in these markets. As in the case of operational flexibility, firms reduce their exposures to exchange rate risks by eliminating the negative effect of appreciated local currency (in the form of higher production costs). However, different from operational flexibility, this strategy reduces the negative effect of appreciated local currency but forgoes the positive effect of depreciated local currency. Therefore, geographical diversification reduces the total variability of cash flows.

Geographical diversification, as discussed in the finance literature, is a non-real-option type operational hedging: it does not provide operational flexibility.

By reducing the variance of the firm's cash flows, hedging can increase firm value by:

- **reducing the problem of underinvestment** and allowing them to take advantage of growth opportunities. Cash flow uncertainty could cause the pursuing of investment strategies that reduce value of the firm - for example, a company might postpone or forgo certain investments in positive net present value projects when cash flows are low (Bartram et al., 2004).

- Geczy et al. (1997) also find that firms' use of currency derivatives is positively related to investment value for **research and development activities** for a sample of Fortune 500 firms.

Also, Stulz (1996) concludes that diversification - as an operational hedging activity- reduces the

underinvestment problem by creating larger internal capital markets. High technology firms may be particularly susceptible to the underinvestment problem given their reliance on intangible assets.

- **a reduction of the probability of bankruptcy and the costs associated with financial distress.** Firms with a higher probability of financial distress and with greater leverage, and hence a greater probability of experiencing bankruptcy would be most likely to benefit from hedging. The need for costly external financing will be reduced by using hedging contracts.

Lewellen, cited by Gleason et al. (2005), finds that in addition to financial hedging, diversification reduces the likelihood of bankruptcy.

Companies located in countries with progressive nature of taxes hedge because there is a convex relation between a firm's effective tax rate and its pretax income.

- reducing **expected tax liabilities** by reducing the variability of cash flows. Tax advantages follow from a smoother profit stream through financial hedging (derivatives) and operational hedging (diversification).

- reducing the likelihood of low cash flow states leading to default, allowing the firm to increase debt capacity and ultimately, the **tax benefits of interest deductions** (Stulz, 1996).

OPERATIONAL VS. FINANCIAL HEDGING

When designing a risk management strategy, operational hedging can be viewed as either a substitute or a complement to a firm's financial hedging strategy when it intends to reduce the volatility of future cash flows and, thus, to increase firm value. In empirical research in risk management, operational hedging strategies are always studied in conjunction with financial derivatives in an exchange rate or commodity setting. This field mainly investigates the substitutability or complementarity of operational and financial hedging instruments and tests whether firms use risk management activities under different risk management motives.

Kim et al. (2006) found that both financial hedging and operational hedging are associated with reducing a firm's currency exposure, their research showing that a financial hedging strategy is nevertheless more effective in reducing foreign exchange risk exposure. They also examined the valuation effects of operational hedging strategies and found that both operational hedging and financial hedging are associated with an increased firm value.

Compared to financial hedging, operational hedging requires higher levels of capital investment

(opening a production facility), but creates long-term hedges against risk exposures including risks that are not contingent on asset prices (such as demand risks, political risks). In particular, operational flexibility has a value creation capability through arbitrage and leverage opportunities. Therefore, in finance, this kind of flexibility is considered to be an operational hedging strategy only when there is a risk hedging rationale for using it.

Operational hedging is complementary to financial hedging because operational and financial hedging strategies are used for managing different types of risk exposures, i.e., operational hedging for long-term exposure (economic exposure) and financial hedging for short term exposure (transaction exposure)(Kim et al., 2006).

Allayannis et al. (2001) investigated the importance of financial and operational hedges as tools for managing foreign-currency exposure.

They found that geographic dispersion through the location of subsidiaries across multiple countries or regions does not reduce exchange rate exposure, whereas firms' financial hedging strategies are related to lower exposures. They also established that geographically dispersed firms are more likely to use financial hedges to protect themselves from exchange-rate risk.

They concluded that, while firms' operational hedges are not associated with higher value, the use of operational hedges in conjunction with foreign-currency derivatives improves firm value.

In establishing a risk management strategy, the main advantage of financial options, that are much more liquid than real options, must be taken into consideration. Real options imply long periods of time to be developed or achieved, and also to be sold, whereas financial derivatives can be easily traded and positions can be quickly reversed (Triantis, 2005). This is particularly valuable if the firm bases its risk management on its estimations of future market conditions, that may change over time.

Hommel (2005) considered geographical diversification and operational flexibility in the form of a real switching option as two separate operational hedging strategies and investigated the incentives of firms to hedge currency risk with financial and operational means in a multinational context, finding that operational flexibility is employed as a hedging device when the exchange rate and demand volatility are sufficiently large or in the case there is a minimum profit constraint such that firms have incentives to hedge their payoffs to satisfy this constraint.

Chowdry and Howe (1999) also state that by having plants in several countries, multinationals can align their costs and revenues besides shifting production among these locations and argue that the facility location decision is considered to be an

operational hedging strategy only when firms are concerned with the variability of their operating profits.

Capacity allocated to the foreign location relative to the domestic location will increase when the variability of foreign demand increases relative to the variability of domestic demand or when the expected profit margin is larger.

As in the case of operational flexibility, by using geographical diversification, firms reduce their downside exposures to exchange rate risks by eliminating the negative effect of appreciated local currency (in the form of higher production costs). However, different from operational flexibility, firms also sacrifice the gains in the upside by forgoing the positive effect of depreciated currency (in the form of lower production costs), so that multinational firms will engage in operational hedging only when both exchange rate uncertainty and demand uncertainty are present. Operational hedging is less important for managing short-term exposures, since demand uncertainty is lower in the short term. Operational hedging is also less important for commodity-based firms, which face price but not quantity uncertainty. For firms with plants in both a domestic and foreign location, the foreign currency cash flow generally will not be independent of the exchange rate (Allayannis et al., 2012).

CONCLUSIONS

As a financial risk management strategy, hedging at the firm level can create value to the benefit of shareholders in the presence of real-world capital market imperfections, such as direct and indirect costs of financial distress, costly external financing, and taxes. In this article we carefully compile and analyze evidence on this issue,

A company's risk management requires a careful process of diagnosing a firm's risk exposure and designing a well-integrated risk management strategy. The first step in this process is the decomposing of risk exposure to understand the fundamental sources of risk. The risk must be then assessed in order to establish what types of risks should be addressed by adequate strategies. The last step is to explore the different approaches for reducing the risk exposures, among which financial and operational hedging detach as effective instruments in raising a firm's value.

A firm that is able to take advantage of its real options, and simultaneously use financial contract to transfer and control any residual risk can fully benefit from the enhancing value effects of an integrated risk management strategy.

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