

Financial Risk Management: The Big and the Small

Peter R. Crabb¹
School of Business
Northwest Nazarene University
623 Holly Street,
Nampa, ID 83686,
phone:208-467-8404, fax:208-467-8440
email: prcrabb@nnu.edu.

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Abstract

This paper looks at the question of financial risk management for small business. The discussion includes both the economic motives for financial risk management, and the use of derivatives in financial risk management. An argument for the use of derivatives at small firms is put forth by showing how the best practices in financial risk management found at large firms can be put in place at small businesses as well.

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Introduction

In the 2002 Annual Report for McDonald's Corporation, management reports that “while changing foreign currencies affect reported results, McDonald’s lessens exposures, where practical, by financing in local currencies, hedging certain foreign-denominated cash flows and by purchasing goods and services in local currencies.” The McDonald’s corporation explicitly warns their investors of the potential for changes in currency exchange rates to impact company profits, but that the company will take practical steps to eliminate these risks. All companies that sell goods internationally, buy goods internationally, or compete against firms that do, face the risk that exchange rate changes will adversely affect their business. Can all companies minimize risks such as these in the manner that McDonald’s does? Can small companies finance in different currencies? Should small companies manage financial risks?

Both economic and finance research attempts to accurately measure this risk and determine the appropriate response of the firm to such risk. In general, the economics literature focuses on the strategic response of the firm to exchange rate risk, while the finance literature focuses on securities and hedging techniques that firms use to lay off exchange rate risk. Exchange rate risks are just one type of financial risks facing many different firms. This paper discusses both the economic consequences and financial practices of financial risk management; specifically, what are the “best practices” in financial risk management and can these practices be put in place for both large and small firms.

Risk Management- Theories and Applications

Why do firms, large or small, try to manage risk? Every firm faces loss exposures – financial and otherwise. The processes that the firm puts in place to control these loss exposures is called risk management. To control many of these losses, such as natural disasters, fire, and burglary, the firm purchases insurance. Financial risk management is a different process - the processes in place for a firm to control for the loss of adverse price movements, such as the change in foreign currency values, commodity prices, or interest rates. These risks have also been called Marketing risks, or the uncertainty in the market for your product that results from uncertainty about the price you will receive, or loss of a market you were expecting to sell to. Financial risk management seeks to mitigate these specific product market risk as well as risks associated with the entire market for goods and services, namely the risk of inflation and changes in interest rates. Are these financial risks just part of doing business, or should the management of any firm take “insurance like” positions to control these risks?

The theoretical work addressing this question often does so by introducing friction into the classical financial models of Modigliani and Miller, i.e., the M&M propositions. In the perfect world of M&M, there is no need for the firm to control risk since investors can accomplish this task themselves. Investors hold diversified portfolios that are protected from adverse price movements because such movements affect firms differently and in differing magnitudes. One theoretical model looks at the M&M model to find what practical aspects of the real world create situations where the firm should practice financial risk management. Smith and Stulz (1985) identify two important cases (sources of friction in the classical model) where corporate risk management, or hedging,

should be undertaken: the costs of financial distress and managerial risk aversion. First, many firms face significant costs in the case of financial distress such as bankruptcy liquidation, legal fees, and loan covenants. Minimizing exposure to financial distress therefore reduces the expected cost of financial distress and therefore increases the value of the firm. If a firm's assets are easily liquidated it is more valuable. Second, if managers are risk averse and their wealth and compensation is primarily driven by the value of the firm, hedging is appropriate. Managers will hedge risks that investors can otherwise avoid simply by diversifying their portfolios. A specific risk that most managers can identify is the risk of changes in foreign currency values. Stulz (1984) finds that hedging of foreign exchange risk is beneficial when managers' are risk averse and their compensation depends on changing values of the firm.

An example of misdirected management incentives recently occurred in the auto industry. To meet tighter emissions standards during the 1990s, auto makers added more platinum to their catalytic converters. During this time, Ford Motor Co. built up stockpiles of platinum. In 2001, however, Ford stepped up research on ways to reduce the need for them, and these efforts paid off in a new technology that the company does not need so much of the metals. Prices for the platinum then dropped over the year, and Ford's massive platinum stockpile lost most of its value. Ford did not hedge its risk in precious-metals prices. Meanwhile, General Motors Corporation began to reduce its use of platinum metals the late 1990s and used financial derivatives to hedge the risks. The managers at GM avoided a risk it could not control, precious metal prices, while working on risks it could control, automobile engineering.

Froot, Scharfstein, and Stein (1993) present a slightly different model that finds that a less than full hedge may be the optimal hedge position for the firm. Their economic model is one of the first to suggest that anything less than a full hedge could be appropriate for the firm. The key assumption driving this result is that the firm faces increasing costs of external financing because of imperfect capital markets. If perfect capital markets existed firms could meet all investment opportunities through external financing. Each firm simply goes to the bank whenever it needs money. However, since bankers will not willingly pass out money every day, hedging overcomes an underinvestment problem. The firm hedges risks, such as interest rate and exchange rate changes, in order to be sure that it has enough cash around to meet all its investment opportunities as they arise. A firm with many investment opportunities (growth potential) will hedge more, while a firm with little need for new investment funds will hedge less.

In summary, we do not live in a perfect world and there therefore exists sound theoretical reasons for why the firm should seek to control financial risk. There exist practical costs that arise from the risk of doing business and these costs can be reduced by hedging and other risk mitigation processes. These costs are faced by both large and small companies but as mentioned above, a large firm such as McDonald's Corporation has many ways to mitigate risk: finance in different currencies or different maturities, hedge using derivatives like futures and options, and diversify by purchasing goods and services around the world. This wide variety of risk management options is not available to small firms. Specifically, by their nature, small firms are unable to diversify.

The primary means of external financing for small business is the local bank. The local banking professional has the knowledge and ability to assess the credit worthiness of smaller firms. Smaller firms are unable to use the broader capital markets because investors require high rates of return on what would be considered speculative investments. Therefore, financing in multiple currencies is not an option for small businesses facing the risk of changes in currency value. For example, a U.S. importer of raw materials from Asia faces the risk that the value of the dollar will rise relative to Asian currencies, raising the firm's costs of production through material costs. This firm is unlikely to raise debt or other financing denominated in Asian currency for the foreign capital market participants will have no knowledge to use in assessing the firm's credit worthiness.

Just as diversification in financing choices is difficult, the small firm is unable to diversify its operations. Smaller firms normally have few suppliers of goods and services. Given their well known name, the McDonald's Corporation can purchase both materials and professional services anywhere in the world. Smaller firms do not have the clout, or the logistical ability, to purchase the necessary goods and services from many vendors. Thus, the small firm is not diversified in either its business or financial operations.

Of the three methods employed by McDonald's to mitigate financial risk, only one remains, hedging. The only financial risk management practice available to all small firms is the strategy of taking specific financial positions that offset the risk of loss in the firm's business and financial operations. Hedging is the process of making an investment to reduce the risk of adverse price movements in any particular business asset or cash

flow from operations. Normally, a hedge consists of protecting this position with a related security, such as an option or futures contract.

Derivatives

Options and futures derive their value from other financial assets. Such assets are called derivatives. A derivative is any financial contract whose value is dependent upon the value of some underlying asset. Derivatives can be used to reduce risk (hedge) or take on risk (speculate). For financial risk management purposes, we are only concerned with hedging; speculating is not the job of the business manager.

To many, “derivatives” is a four-letter word. Businesses both large and small have seen the problems that reckless use of derivatives can cause. In the early 1990s Procter and Gamble Corporation lost over \$100 million through speculative use of interest rate derivatives. In discussing the loss, P&G Chairman Edwin L. Artzt said "Derivatives like these are dangerous and we were badly burned. We won't let this happen again."² In the same year Gibson Greetings Inc. said it incurred a \$3 million loss as a result of "unauthorized" interest-rate swaps involving "aggressive forms of derivatives." Both very large and medium sized firms have incurred large losses from the improper use of derivatives; the small firm could never survive such a loss.

So, we know that derivatives should not be used without “authorization” or “aggressively”. That is, firms should not speculate with derivatives. But should the small firm use derivatives to hedge risks? If the firm is to be profitable, it must exploit the valuable opportunities it faces. This in no doubt involves risk. Firms, therefore, should avoid risks that are not profitable so that it can take on the risks that are.

Derivatives can be used for this purpose, but the firm must have a strong process in place to assure it is actually hedging, and not speculating.

Empirical Findings

Numerous academic studies have sought to answer why firms use derivatives. Support has been found for each of the theoretical hedging motives discussed above (see for example Bailly, *et. al.* (2003) Gay, *et. al.* (1998), Geczy, *et. al.* (1997), Graham and Rogers (2002), and Nance *et. al.* (1993)). Surprisingly though, is the consistent finding in these studies that the use of derivatives is positively correlated with firm size. This finding suggests that the firms less likely to need derivatives as a hedging tool, because they have the opportunity to diversify in the manner of McDonald's Corporation, is the most likely to use it. Proctor & Gamble is a multi-billion firm with operations around the world and in numerous product offerings, but according to the empirical research, P&G is likely to have numerous derivative positions and Gibson Greetings is unlikely to use derivatives.

Why do smaller firms with less diversifiable risk choose not to use derivatives? Many answers to this question have been proposed, but two stand out. First, derivative use is often seen as a sophisticated process that requires an advanced academic degree, usually in mathematics. This is more likely to be true when the firm faces many risk exposures: currency values, commodity prices, interest rates, etc. Second, the costs of deciding upon and setting derivative positions may be high. These costs include both monetary investments in advisor and broker fees and the time management must devote to the process. Smaller firms are unlikely to have the managerial resources available to

² Wall Street Journal. (Eastern edition). New York, N.Y.: Apr 13, 1994. pg. A3

devote to the process. Large corporations often employ a full-time risk manager to identify and analyze possible loss exposures. Is risk management therefore out of the question for the small business manager? Is the small firm not only unable to diversify, but also unable to transfer risks by taking derivative positions? To answer the question, I next look at the risk management systems in place at three sample firms.

Risk Management Procedures

The following examples in place at U.S. corporations serve to demonstrate what is necessary in managing financial risks. In the first two cases, procedures and corporate guidelines are in place with the objective of serving the company, allowing it to avoid risks that are not profitable so that it can take on the risks that are. Furthermore, these guidelines serve to protect against the unauthorized use of derivatives for speculative purposes. In the third case, the firm has purposely chosen to speculate for profit in the derivative markets.

Let's start with the very big. Merck and Company, a company with a \$114 billion market value, has an extensive program in place to manage both foreign currency and interest rate exposures. As outlined in their 2002 annual report, the program has four main steps. First, the report states that "Merck relies on sustained cash flows generated from foreign sources to support its long-term commitment to U.S. dollar-based research and development. To the extent the dollar value of cash flows is diminished as a result of a strengthening dollar, the Company's ability to fund research and other dollar-based strategic initiatives at a consistent level may be impaired." Thus, the first step in risk management at Merck & Co. is the determination of the strategic need for hedging risks.

Merck's life-blood rests in its research and development activity; cash must readily be available for continuing research programs and financial risks hinder this goal.

Second, the company also states that "to achieve this objective, the Company will partially hedge anticipated third party sales that are expected to occur over its planning cycle, typically no more than three years into the future." Thus, the hedging program is not short-term in nature, that is, they are not constantly changing positions, but rather protecting cash flows in the future. The risk-management program has a specific time frame. Furthermore, the company is only partially hedged. Since cash flows and other financial positions must be estimated, the firm is practically limited in its ability to fully hedge, and even if it could fully hedge, any upside potential from favorable price moves would be eliminated.

Third, Merck reports that "The portion of sales hedged is based on assessments of cost-benefit profiles that consider natural offsetting exposures, revenue and exchange rate volatilities and correlations, and the cost of hedging instruments." This indicates that the firm has measured its exposure, not only directly, but with the additional consideration of any naturally offsetting positions. The firm has not only found the direct price risk, but the overall economic exposure of the firm to the risk.

Fourth, "Merck manages its anticipated transaction exposure principally with purchased local currency put options which provide the Company with a right, but not an obligation, to sell foreign currencies in the future at a predetermined price," and "Merck principally utilizes forward exchange contracts which enable the Company to buy and sell foreign currencies in the future at fixed exchange rates and economically offset the consequences of changes in foreign exchange on the amount of U.S. dollar cash flows

derived from the net assets,” and “the Company may use interest rate swap contracts on certain investing and borrowing transactions to manage its net exposure to interest rate changes and to reduce its overall cost of borrowing.” In this part of the program, the company has chosen specific derivative instruments to manage specific types of risk. The risk of foreign currency fluctuations affecting cash flow from operations is managed with options, while asset positions on the balance sheet are managed with foreign currency forwards, and interest rate risk is management with swaps. The company has carefully selected the appropriate derivative instrument for the appropriate type of risk.

In contrast to this extensive program at a large company, Perma-Fix Environmental Services, Inc., a professional waste management company with a market value of approximately 58 million, utilizes an equally important, but far more simple risk management program. In their 2002 annual report, Perma-Fix reports that “the Company entered into an interest rate swap agreement effective December 22, 2000 to modify interest characteristics of its outstanding debt from a floating basis to a fixed rate, thus reducing the impact of interest rate changes on future income.” Again, the company identified a financial exposure and chose a derivative position that directly offsets a known risk to the firm’s operations. This is the only derivative in place at the firm and a policy of not speculating in derivatives is clearly in place.

In contrast to this limited risk management practice, CREDO Petroleum Corporation, a \$65 million company, engaged in oil and gas acquisition, exploration, development and production activities mostly in the mid-continent and Rocky Mountain regions of the United States, frequently trades derivatives. According to their 2002 annual report, “the company periodically hedges the price of its oil and gas production

when the potential for significant downward price movement is anticipated,” and “..all other futures transactions are accounted for as speculative transactions and gains and losses are immediately recognized in other income.” This company is engaging in both hedging activity to eliminate market, or price risks, while also speculating on these price movements. CREDO’s derivative transactions take the form of forward, or "short," selling in the NYMEX futures market.

Empirical studies have looked at whether or not this practice of taking speculative derivative positions is valuable to the firm. The evidence indicates that corporations frequently engage in speculative activity by varying their hedge positions substantially through time, and there is little or no evidence to indicate that the firms have the ability to selectively hedge in this manner. Any gains from this selective hedging are typically small and there are significant costs associated with selective hedging, these activities may actually reduce firm value.³ Corporative behavior of this sort has no more success than the individual day-trader.

Risk Management Programs for Small Businesses

Is financial risk management out of reach for the small business owner? Is the use of derivatives a valuable practice for only the large firm? From the theoretical and empirical evidence presented here, the answer to both these questions is no. Small businesses can benefit from instituting a risk management program. Properly executed and controlled, this program should include the use of derivative instruments. Two main points from this discussion confirm this conclusion.

³ See for example, Brown, *et. al.* (2002).

First, the small firm is the potentially at the greatest risk; the small firm can not employ the risk management practice of diversification. Small business do not operate around the world, selling many products, issuing debt in many different capital markets, and purchasing wide varieties of good and services denominated in various currencies. Without diversification, derivatives are likely to be the only risk management tool available. Unfortunately, the evidence indicates that few small firms employ this tool.

Second, the small firm can institute a risk management program that addresses specific exposure, thereby avoiding the derivative debacles like those P&G and Gibson Greetings. To do this, small companies should learn from the big companies. Large firms follow strict programs like that of Merck and Company.

Any risk management program should include the following four steps:

1. A strategic decision for managing financial price risk must exist. As always, financial operations should support business operations, not the other way around. Examples of such strategic purposes include the need to create good managerial incentives, supporting research investments, and supporting capital investments. These purposes are consistent with the objective of serving the company by allowing it to avoid risks that are not profitable so that it can take on the risks that are.
2. The full economic exposure must be identified. After identifying a market price risk such as foreign currencies or interest rates, the firm must identify if there are any natural offsetting positions in its

operations. In this manner, the firm is using the benefit of diversification if it exists.

3. Only derivatives that match the risk exposure should be used. The company must choose a specific derivative instrument to manage a specific type of risk. Risks affecting cash flow from operations are often best managed with options, because cash flows are hard to predict. More predictable asset positions can frequently be managed with forwards and futures.
4. Speculation in derivatives should never take place within the firm. Taking positions in derivatives is generally easy and inexpensive, and when using derivatives, a firm's exposure to financial price risk can quickly rise, instead of falling, without the proper controls. It is therefore imperative that the firm monitor its derivative positions frequently and measure risks accurately. Monitoring by an outside entity such as the firm's bank and its auditors is helpful. Further controls, such as setting specific time frames for hedge positions, can also help the firm avoid losses in derivative markets.

By duplicating these big-firm practices small firms can improve their businesses through financial risk-management.

Conclusion

Both large and small firms face financial risks: the risk that commodity market prices, foreign currency values, and interest rates will vary over time. There exist sound

economic reasons for firms to engage in the practice of hedging these risks on the behalf of the shareholders. Larger firms are at a distinct advantage in this process in that they have naturally offsetting positions in their vast operations that mitigate financial risks. The only definitive tool for financial risk management available to small business is the financial derivative. However, studies indicate that smaller businesses do not use derivatives as extensively has large businesses. This does not need to be true. By following the sound practices in place at many large firms, small businesses can achieve greater success through financial risk management. Financial risk management provides the small business with the opportunity to shed risks that are beyond its control so that the firm can pursue risks that are within their control.

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