

The Theory and Practice of Corporate Risk Management: Evidence from the Field

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We survey more than 1,100 risk managers from around the world regarding their risk management policies. We find evidence consistent with some traditional theories of risk management, but not with all. We then study “why” or “why not” firms hedge and find that almost 90% of risk managers in nonfinancial firms hedge to increase expected cash flow. We also find that 70% to 80% of risk managers hedge to smooth earnings or to satisfy shareholders’ expectations. Our analysis also suggests that regulatory changes implemented to increase market stability (e.g., Dodd-Frank Act) could discourage corporate hedging. Finally, we provide evidence regarding hedging in six areas of risk: interest rate, foreign exchange, commodity, energy, credit, and geopolitical. We find that operational hedging is more common than financial hedging in all risk areas except foreign exchange.

The practice of risk management is difficult for outsiders to observe. While disclosure regarding risk management activities has become more prevalent in the past decade, such disclosures only tell part of the story about firm behavior and very little about the underlying preferences and incentives of the managers making risk management decisions. Surveys offer one method of understanding both risk management practices and the underlying philosophies of risk managers.

We perform a detailed investigation of corporate risk management practices using a comprehensive survey of risk managers from around the globe. Our sample of respondents is broad including both financial and nonfinancial firms, as well as publicly traded and privately owned firms. We gather information about multiple dimensions of the risk management process that include both financial and operational methods for managing risk. In addition, we ask specific questions concerning risk managers and use psychometric methods to assess their risk aversion. To our knowledge, our survey is more comprehensive than previous risk management surveys

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(e.g., the Wharton surveys by Bodnar et al., 1995; Bodnar, Hayt, and Marston, 1996, 1998) and is one of the first surveys that is truly global in coverage.^{1,2}

We use these unique data to perform the following analysis. First, we explore whether a risk manager's described practice of risk management is consistent with traditional theories. In addition, we analyze the importance of different factors to explain "why" or "why don't" firms hedge. For example, we ask firms how important hedging is in reducing cash flow volatility and improving credit (CR) ratings, or whether they do not hedge due to concerns with the disclosure requirements or counterparty risk. Moreover, we study the link between managerial characteristics (including risk aversion) and hedging. Finally, we investigate corporate risk management programs and practices in the context of the following six risks: 1) interest rate (IR), 2) foreign exchange (FX), 3) commodity (CM), 4) energy (EN), 5) credit risk (CR), and 6) geopolitical risk (GP). Overall, our findings thoroughly describe the practice of corporate risk management that we hope will stimulate future research.

In line with prior empirical studies (Nance, Smith, and Smithson, 1993), we find only partial support for the traditional theories of risk management. For example, we uncover evidence consistent with the agency models of risk management (Smith and Stulz, 1985), but not with CR rationing (Froot, Scharfstein, and Stein, 1993) and information asymmetry motives (DeMarzo and Duffie, 1991, 1995). In light of these findings, we directly ask risk managers to tell us "why" or "why don't" their firms hedge. For nonfinancial firms, we confirm that almost 90% of these managers indicate that they hedge to increase expected cash flows.³ Similarly, we determine that smoothing earnings is an important reason that firms hedge. More than 80% of risk managers say that they hedge to decrease unexpected losses and more than 70% indicate they hedge to increase earnings predictability. Further, we find that more than 80% of the risk managers say that they hedge because shareholders expect the firm to do so.

Our analysis also suggests that market conditions, accounting rules, and regulatory changes (e.g., the Dodd-Frank Act of 2010) can affect corporate hedging. For instance, more than 30% of the respondents told us that restrictions on customized over-the-counter (OTC) derivatives and a move to all standardized, exchange-traded contracts would result in a reduction in hedging. Similarly, the majority of risk managers indicate that having to post collateral on OTC instruments, or post more collateral than has been traditionally required, would result in a decrease in derivative usage. We believe that these findings could be useful to policymakers around the world who are trying to understand whether imposing stricter derivatives regulations to increase market stability might have other (unintended) consequences. Our results suggest that regulatory changes that make it more difficult and/or costly to trade derivatives could discourage corporate hedging.

A unique feature of our study is that we document the extensive use of operational hedging. Interestingly, operational risk management is used more frequently than financial contracts to manage five of the six types of risk we study (except for FX). In some of the risk areas, the prevalence of operational methods is striking. For example, 83% of the firms use operational methods to manage GP risk compared with only 20% that use insurance contracts. Similarly, 88% of firms use operational CR risk management relative to 40% using derivatives.

¹ See the Appendix for a (nonexhaustive) list of past surveys of risk management practices.

² A survey of Deutsche Bank customers' risk management policies by Servaes, Tamayo, and Tufano (2009) was also global in its sample structure, but is much smaller than this survey.

³ The theoretical literature has recently explored how hedging could lead to greater cash flows. Purnanadam (2008) finds that hedging allows firms near financial distress to stabilize their financial situation, which, in turn, allows these firms to preserve their market share and boost their earnings. This occurs because customers, suppliers, and other stakeholders are more comfortable engaging in a business relationship with more financially stable firms.

For all six risk areas, we analyze the specific types of financial instruments and operational methods firms use to manage risk. The majority of respondents (about 60%) indicate that they only or mostly use OTC instruments to manage IR, FX, or CM/EN risk. In contrast, 10% say that they exclusively use exchange-traded instruments to manage IR risk. IR swaps are the most popular way to manage IR risk (67% of the respondents), while forward contracts are the preferred financial instruments to hedge FX risk (64%) and CM/EN risk (39%). The most common methods to manage CR risk are to impose a minimum CR rating for the counterparties (65% of respondents) or strict caps on exposure to any single counterparty (61%).

We also analyze the operational methods firms use to manage FX risk and GP risk. The two most common operational methods to manage FX risk are pricing strategies (used by 55% of the firms) and foreign currency debt (45% of firms). To deal with GP risk, 50% of firms indicate that they avoid (and 39% say they decrease) investment in risky countries. In addition, 26% of firms also manage GP risk by lowering their company profile in a risky country. Together, these results suggest that GP risk has massive economic consequences for the risky countries.

We also examine the link between macroeconomic conditions and firms' market views and their hedging decisions. With respect to macroeconomic conditions, 57% of the respondents say that the shape of the yield curve affects their IR hedging decisions. Relatedly, 60% of the respondents indicate that their market view on IRs is important or very important concerning the extent in which their firm manages IR risk. The effects are smaller, but still sizable when we ask how the firm's home country's current account balance and domestic national government budget balance influence its FX hedging policy. About 30% of firms indicate that these macroeconomic variables affect their hedging strategy. Relatedly, 45% of respondents confirm that their market view on exchange rates was either very important or important for FX hedging decisions.

We provide details of these and many more results in the following sections. Section I reviews the theoretical corporate risk management literature. Section II describes the survey sample and reviews evidence from existing studies. In Section III, we use our survey data to determine why firms manage risk and take advantage of the data's unique features to better understand what drives and limits corporate risk management. Section IV describes the risks firms face and important features of their risk management programs, as well as summarizes risk management practices for all six specific risk areas. Some concluding remarks are offered in Section V.

I. Theories of Risk Management

In this section, we briefly review some of the core risk management theories. In a frictionless world (Modigliani and Miller, 1958), firm value does not depend upon hedging (neoclassical view of risk management). Several theories of risk management have been developed over the last 30 years. These theories depart from the neoclassical view by considering the effect of CR friction and other market imperfections on the firm's decision to hedge. In this section, we summarize the key insights from these theories, review some of the main empirical studies, and discuss the empirical results from our survey.

In the CR-rationing models of risk management (Froot et al., 1993; Holmström and Tirole, 2000), firms hedge to mitigate the effect of CR rationing on investment.⁴ Risk management helps to mitigate the effect of CR rationing as it reduces the volatility of cash flows that can be used to fund new investment projects in states where access to CR is limited or very costly. Froot et al.

⁴ Mello and Parsons (2000) develop a dynamic model to demonstrate that hedging mitigates financial constraints by reducing the costs of financial distress and increasing financial flexibility.

(1993) and Holmström and Tirole (2000) also argue that access to liquidity (e.g., cash or prearranged lines of CR) can function as a substitute for risk management in mitigating CR rationing.

The key prediction from the CR rationing model of risk management is that firms are more likely to hedge if they face CR rationing. Given that the importance of risk management as an instrument to mitigate financial constraints is related to a firm's need to fund future investments, in our empirical tests, we control for investment prospects. We also control for whether firms have access to liquidity (cash, profits, and CR lines) because, as discussed, theory predicts that liquidity can be a substitute for risk management in mitigating CR rationing.

Breeden and Viswanathan (2016), DeMarzo and Duffie (1991, 1995), and Raposo (1997) argue that when it is difficult for noncontrolling shareholders to assess the quality of management, higher quality managers hedge to mitigate the effect of external factors on the firm's performance and, in this way, separate themselves from lower quality managers. Lower quality managers cannot mimic this strategy as setting up a hedging program is costly. The primary prediction from this signaling argument is that firms are more likely to install a risk management program when information asymmetry is high.

In Smith and Stulz (1985), firms issue debt to generate tax shields. However, debt also increases the probability that a firm will face financial distress and file for bankruptcy. In this framework, hedging can increase firm value by reducing the losses of bankruptcy. The key prediction from this financial distress model of risk management is that firms are more likely to hedge when the risk of financial distress is high.

In the agency models of risk management (Smith and Stulz, 1985; Holmström and Ricart i Costa, 1986), the interests of risk-averse managers are not aligned with the interests of well-diversified risk neutral shareholders. In this framework, risk-averse managers can mitigate the effect of their exposure to the firm by hedging, even if this decision is not optimal for risk-neutral shareholders. To assess whether a manager's exposure to her firm affect risk management, in our regressions we control for the extent in which the executive is compensated with equity. Table I presents a summary of the main empirical predictions from the theories of risk management.

II. Survey Design, Survey Sample Characteristics, and Archival Data Evidence

A. The Survey Data

The survey instrument is an online questionnaire with several sections. The initial section asks questions identifying the types of risk the respondent firm's face and whether and how they are managed. For firms that use derivatives, there is a section with detailed questions about the use and control of derivatives. For firms that do not use derivatives, we explore why they don't. In addition, there are sections that investigate risk measurement and management in each of the six specific risk areas. The final section gathers demographic information about the firm and the risk manager.

The core of our sample is the firms that participate in the Duke Quarterly CFO (chief financial officer) survey (cfosurvey.org) that includes 3,624 CFOs. We expand the sample by surveying members of the International Swaps and Derivatives Association (ISDA) and the Global Association of Risk Professionals (GARP). This group includes both private and public firms, nonprofit organizations and associations, as well as some government-owned/controlled entities. To increase the chance that the risk managers will disclose their views, all responses are strictly anonymous.

Table I. Theories of Risk Management: Summary of Empirical Predictions

Theories	Main Theory Reference	Key Assumptions	Role of Managerial Risk Aversion	Main Predictions	Testable w/ Archival Data	Testable w/ Survey Data
Neoclassical View	Modigliani and Miller (1958)	Absence of friction	No	No risk management	Yes	Yes
Credit Rationing	Froot et al. (1993)	Credit rationing; firm is risk neutral	No	Risk management more likely by credit rationed firms, controlling for growth opportunities and access to liquidity	Yes	Yes
Information Asymmetry	DeMarzo and Duffie (1995)	Managerial ability unobservable; firm is risk neutral	No	Risk management more likely by high quality firms when information asymmetry is higher	No	Partially
Financial Distress	Smith and Stulz (1985)	Bankruptcy is costly; firm is risk neutral	No	Risk management more likely if the firm can face financial distress	Yes	Yes
Agency Problems	Smith and Stulz (1985)	Shareholder-manager; shareholder-bondholder conflicts; firm is risk neutral	Yes	Risk management more likely if manager risk aversion is high (holding stock ownership constant)	No	Partially

Email invitations for the online survey were sent in the last week of February 2010. Subsequent emails were sent in late March and the survey site was closed at the end of April 2010. In all, we received 1,161 responses, 846 of which are from the Duke-CFO list and 315 from the ISDA-GARP group. For the Duke-CFO list, these figures correspond to a response rate of 23% (= 846/3,624). The ISD-GARP group consisted of many professionals who are not risk management officers and who we asked not to complete the survey. This makes it difficult for us to determine exactly the response rate for this group. That is, we asked respondents to fill out the survey only if they had significant decision-making power over risk management policies and implementation. Thus, a low “response rate” on the ISD-GARP group could simply be the result of a small proportion of the email group having decision-making authority. To our knowledge, with 1,161 responses, this is the largest risk management response sample ever collected.

With our survey consisting of 10 sections, some with as many as 10–12 questions, it would be burdensome to ask each respondent to fill out the entire survey, especially if their firm faced risk in each of the six areas. As a result, we designed a randomization structure for survey participation. All survey participants filled out the general sections on risk management and derivative use or nonuse and the demographic section. However, if they indicated that they managed risk in more than one of the six areas, we randomized which sections (up to two) they would complete. To address potential survey fatigue, we also randomized the order in which the sections were presented.

Table II presents the demographic breakdown by region (location of headquarters), basic industry by broad sector, annual gross sales (in USD), structure of ownership (whether publicly traded, privately owned, government-owned, or a nonprofit), and CR rating (self-reported). The sample is very diverse in all dimensions. Casual observation suggests that the response group appears to be tilted toward North American firms, financial firms, large firms, privately held firms, and firms with strong CR ratings relative to the overall population.

Table III presents information regarding firm and manager characteristics obtained from the responses to the demographic questions included in the survey. These questions elicit firm characteristics related to sector, risk management, size, location of headquarters, CR rating, corporate governance, ownership structure, and a series of performance and financial structure measures. As for characteristics of the risk managers, we asked a set of psychometric questions to gain information about their degree of risk aversion, as well as other questions about age, education, time in job, and compensation structure.

B. Empirical Evidence on Risk Management

Empirical evidence concerning risk management theories is somewhat scarce. The main limitation is that the data necessary to test these theories is not always available from standard archival databases. In this section, we review the main archival-based empirical studies. A summary of the findings in these studies is presented in Table IV.

Nance et al. (1993) test the CR rationing hypothesis of risk management and find mixed evidence. The authors rely on Tobin’s q as a proxy for growth prospects. The problem with this measure is that it does not capture information on growth opportunities that are unknown to outsiders. We directly ask the risk managers to give us their inside views on the investment growth prospects of the firm.⁵

To our knowledge, there is no empirical study on whether firms substitute lines of CR for hedging. This likely is because there is no archival database that combines information on risk management with CR line data. Our survey database overcomes this limitation.

⁵ See Petersen and Thiagarajan (2000) for additional discussion on the limitations of using information from financial reports or market data to measure investment prospects.

Table II. Basic Demographic Characteristics of Survey Respondents – $n = 1,161$

Region (HQ)	Industry	Size (USD Sales)	Legal Form	Credit Rating
North America	Basic Materials	<\$25m	Public Traded	AAA
Asia	Manufacturing	\$25–99m	Private	AA
Europe	Services	\$100–499	Gov't owned	A
Rest of World	Financials	\$500–999	Nonprofit	BBB
No Answer	Diversified/Other	\$1b–4.99b	No Answer	<BBB
	No Answer	+\$5b		NR or N/A
		No Answer		No Answer
				13%

Table III. Firm and Risk Management Characteristics

Firm Characteristics	Question	Responses	Missing
Sector	Firm identifies with broad sector	Basic Materials (BM) = 109	Financial (F) = 404
Risk Management	Firm has program? No/Yes	BM, M, S: No = 338	F: Yes = 340
Revenue	Total sales in the previous 12 months (USD)	<\$500m = 579	37
HQ Location	Geographic location of headquarters	N. America = 529	27
Ownership	Broad ownership structure	Publicly Traded = 429	76
Credit Rating	Self-reported credit rating (S&P scale)	AAA = 120	238
Line of Credit	Firm currently has a line of credit	No = 243	427
Debt/Assets	Ratio of total debt to total assets	<10% = 217	510
Profit Last Year	Firm reported an accounting profit last year	No = 160	396
Inside Ownership	Percentage of common stock (fully diluted) owned by corporate insiders	<5% = 317	562
LT Growth	A self-assessed indicator of the firm's long-term growth prospects	Low = 352	486
Dividend	The firm paid a dividend in the past year	No = 520	30

(Continued)

Table III. Firm and Risk Management Characteristics (Continued)

Manager Characteristics	Question	Responses	Missing
Risk Aversion	Summary of manager's response to 2 part risk aversion question regarding salary uncertainty	Most risk averse = 131	Risk Taking = 261 389
Time in Job	Manager's time in job	<4 yrs = 173	388
Manager Age	Manager's age	4-9 yrs = 238	10+ yrs = 362
Education	Manager's highest education level completed	<45 yrs = 343 UG degree/less = 269	55+ yrs = 164 > Master's = 131
Stock Comp	Manager's percentage of total compensation received in stock form	None = 404	Any = 221 536
Cash Bonus	Manager's percentage of total compensation received as cash bonus	<30% of Comp = 461	30%+ of Comp = 164 536

Table IV. Risk Management: Evidence from Archival Data

Theories	Main Empirical Study	Summary Empirical Findings	Consistent with Prediction	Main Limitation of Archival Tests	Related Empirical Studies
Credit Rationing	Nance, Smith, and Smithson (1993)	Smaller firms hedge less. High Tobin's q firms hedge less. High $R\&D$ firms hedge more.	No No Partially	Growth prospects/financial constraints are difficult to measure.	Graham and Rogers (2002) Geczy, Minton, and Schrand (1997) Gay and Nam (1998)
Information Asymmetry	DeGeorge et al (1996)	Firms w/ high ROA hedge more.	Partially	Information asymmetry on managerial ability is difficult to measure.	N/A
Financial Distress	Graham and Rogers (2002)	High leverage firms hedge more.	Yes	Risk of financial distress is difficult to assess.	Haushalter (2000)
Agency Problems	Tufano (1996)	Firms w/ high management stock ownership hedge more.	Yes	Measure of risk aversion is not available.	Geczy, et al (1997) Berkman and Bradbury (1996) Mayers and Smith (1987) Bessembinder (1991)

DeGeorge, Boaz, and Zeckhauser's (1996) study is the only paper to our knowledge that has tested information asymmetry models of risk management. The authors use return on assets as a proxy for managerial ability. The concern with return on assets and other archival measures is that they are based on observed outcomes and do not necessarily reflect uncertainty about managerial ability. In our study, we analyze the relation between information asymmetry and risk management using the risk manager's inside assessment of the investment growth prospects as a proxy for managerial ability that is unknown to outsiders.⁶

Using hedging information directly collected from annual reports, Graham and Rogers (2002) find that higher leverage firms are more likely to hedge. This finding is in line with the financial distress hypothesis of risk management. The authors also find that hedging has a direct positive effect on debt capacity. They do not find evidence of hedging due to tax function convexity (Graham and Smith, 1999).

The evidence regarding the relation between agency issues and hedging is scarce. Tufano (1996) is one notable exception. One of the core assumptions of the agency models of risk management is that managers are risk averse. The difficulty in obtaining an accurate measure of risk aversion could explain the limited number of empirical studies. To overcome this limitation, we estimate managerial attitude toward risk using a psychometric test.

Our data also contain information on why firms hedge. Tests based only on whether or not the firm hedges could confound other effects. For example, finding that smaller (arguably more constrained) firms hedge less is not necessarily evidence against the CR rationing hypothesis of risk management. In fact, smaller companies might not be able to hedge as setting up a risk management program is too costly (Mian, 1996), they do not have the collateral required by the hedging counterparties (Rampini and Viswanathan, 2010, 2013), or, more simply, they do not face significant hedgeable risks (Booth, Smith, and Stolz, 1984; Block and Gallagher, 1986; Bodnar et al., 1998; Petersen and Thiagarajan, 2000).⁷ By focusing on companies with a risk management program in place and asking their risk manager why they hedge, our study mitigates the effect of these confounding factors.

To summarize, testing the theories of risk management requires firm-level data on whether the firm has a risk management program in place, on the extent of hedging, on the motivation for hedging, on the role played by the risk manager in the decision to set up the risk management program, on whether the firm has access to CR lines or other forms of liquidity, and information on managerial characteristics including manager attitude toward risk. At an even more basic level, one also needs to be able to identify whether the firm is facing any material hedgeable risks. This information is not generally available in standard archival databases. Our data potentially fills this void.

III. Why Do Firms Establish Risk Management Programs?

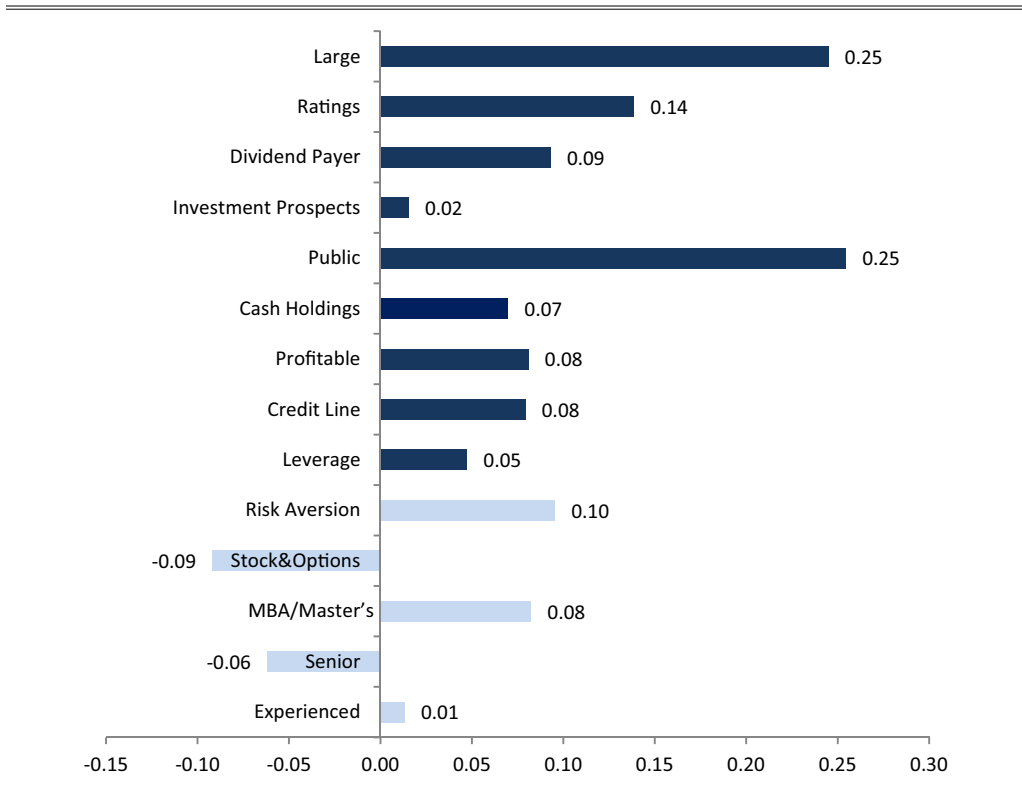
We use our survey to study why firms manage (or do not manage) risk. We estimate a probit model in which the dependent variable, Risk Management, is an indicator for whether firms

⁶ There is a more recent strand of literature focusing on the real effects of risk management. Campello et al. (2011) find that hedging helps firms increase investment by lowering borrowing costs. Carnaggia (2013) argues that the introduction of a new crop insurance program in the agricultural industry had a positive effect on the productivity of firms that had access to the insurance. There is also a stream of literature, primarily in the accounting domain, focusing on the impact of derivative use on firm risk (Guay, 1999; Hentschel and Kothari, 2001; Zhang, 2009) or the role of hedging for stock liquidity (Minton and Schrand, 2014).

⁷ Petersen and Thiagarajan (2000) emphasize that without understanding the risk exposure of a firm, it is not possible to study whether the firm is managing risk according to theory.

Figure 1. Determinants of Risk Management: Marginal Effects

This figure reports the marginal effects relative to the probit estimations in Column 5, Table II for firm characteristics (dark blue bars) and executive characteristics (light blue bars). The data are from our survey, which was conducted in the first quarter of 2010.



have a risk management program. Our set of regressors includes proxies for financial constraints (large, ratings, and dividend payer), investment prospects, information asymmetry (whether the firm is publicly listed on a stock exchange), liquidity (cash, profitability, and CR lines), risk of financial distress (leverage), and managerial characteristics (risk aversion, compensation, education, age, and experience). All of our estimations include regional dummy variables to account for potential differences in risk management practices across different parts of the world. Detailed variable definitions and the estimation results from our risk management probit model can be found in Table V. The results are reported separately for nonfinancial (Columns 1–5) and financial firms (Column 6).

The estimated results in Column 5 (nonfinancial firms, all control variables) indicate that large, rated, and dividend-paying firms establish risk management programs. Contrary to the prediction of the CR rationing hypothesis, these findings suggest that financially constrained firms are less likely to hedge. These results hold when controlling for a firm's need to fund future investment prospects and for whether firms have access to liquidity (cash, profitability, and CR lines). The marginal effects associated with these variables are economically large (Figure 1). For example,

Table V. Firm Characteristics and Risk Management

This table reports probit estimation results from the risk management model. The dependent variable is *Risk Management*, which is an indicator variable for firms that engage in risk management. *Large* is an indicator variable for firms with sales of at least \$1 billion. *Ratings* is an indicator variable for firms with a debt rating. *Dividend Payer* is an indicator variable for firms that pay regular dividends. *Investment Prospects* reflects the respondent's rating of the firm's long-term investment and growth opportunities, ranging from zero (no growth opportunities) to 100 (excellent growth opportunities). *Public* is an indicator variable for firms listed on a stock exchange. *Cash Holdings* is cash holdings and marketable securities as a percentage of total assets. *Profitable* is an indicator variable for firms that reported accounting profits during the previous fiscal year. *Credit Line* is an indicator variable for firms with a line of credit. *Leverage* is the ratio of total debt to total assets. *Risk Averse* is an indicator variable for risk managers who prefer their current salary to a job that pays twice their current salary with 50% probability or 80% of their current salary with 50% probability. *Stock & Options* is an indicator variable for managers with compensation packages that includes stock and options. *MBA/Master's Degree* is an indicator variable for risk managers with an MBA or master's degree. *Senior* is an indicator variable for managers that are older than 45. *Experienced* is an indicator variable for managers with more than four years on the job. The sample includes financial and nonfinancial firms from around the globe. The data are from our survey conducted in the first quarter of 2010. Standard errors reported in parentheses are estimated with heteroskedasticity-consistent errors clustered by region. These statistics do not take test multiplicity into account.

Dependent Variable: <i>Risk Management (Yes = 1)</i>	Nonfinancial Firms					Financial Firms
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Characteristics:						
<i>Large</i>	0.858*** (0.054)	0.650*** (0.099)	0.595*** (0.133)	0.620*** (0.133)	0.629*** (0.185)	0.760 (0.594)
<i>Ratings</i>	0.303* (0.175)	0.179 (0.181)	0.227 (0.184)	0.228 (0.177)	0.350*** (0.137)	0.281 (0.549)
<i>Dividend Payer</i>	0.235*** (0.113)	0.216** (0.109)	0.148 (0.111)	0.161 (0.1342)	0.234*** (0.089)	0.852*** (0.288)
<i>Investment Prospects</i>	0.322*** (0.080)	0.275*** (0.096)	0.326*** (0.127)	0.310** (0.114)	0.039 (0.105)	0.596 (0.984)
<i>Public</i>		0.591*** (0.122)	0.598*** (0.159)	0.599*** (0.115)	0.651*** (0.225)	0.069 (0.175)
<i>Cash Holdings</i>			-0.038 (0.500)	-0.065 (0.545)	0.175 (0.555)	-0.427 (0.453)
<i>Profitable</i>			0.202 (0.278)	0.227 (0.297)	0.204 (0.326)	0.491 (0.361)
<i>Credit Line</i>			-0.014 (0.121)	0.066 (0.168)	0.200 (0.257)	-0.451** (0.177)
<i>Leverage</i>				0.026 (0.287)	0.119 (0.365)	0.009 (0.226)
Managerial Characteristics:						
<i>Risk Aversion</i>					0.241*** (0.090)	0.341 (0.431)
<i>Stock & Options</i>					-0.231 (0.250)	0.300 (0.540)
<i>MBA/Master's</i>					0.208*** (0.062)	0.955*** (0.339)

(Continued)

Table V. Firm Characteristics and Risk Management (Continued)

Dependent Variable: <i>Risk Management</i> (Yes = 1)	Nonfinancial Firms				Financial Firms	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Senior</i>					-0.156** (0.069)	0.316 (0.329)
<i>Experienced</i>					0.034 (0.120)	0.340 (0.275)
Region-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	399	399	377	362	316	132
Pseudo- R^2	0.114	0.141	0.142	0.151	0.172	0.352

***Significant at the 0.01 level under the assumption of a single test.

**Significant at the 0.05 level under the assumption of a single test.

*Significant at the 0.10 level under the assumption of a single test.

the propensity for large firms to hedge is 25 percentage points higher than for small firms. The marginal effects for ratings and dividend payers are 14% and 9%, respectively.⁸

The evidence in Column 5 also pertains to informational asymmetry models of risk management (DeMarzo and Duffie, 1995). To the extent that information asymmetry is higher for small (or unrated or nondividend paying) firms, theory predicts these firms to hedge more often than their large firm counterparts. The evidence in Table V suggests the opposite. Likewise, we compare public and private firms. Brennan and Subrahmanyam (1995), Easley, O'Hara, and Paperman (1998), and Hong, Lim, and Stein (2000) suggest that information asymmetry is lower for public firms as they are followed by analysts, so we could expect less public firm hedging. The evidence in Table V indicates just the opposite in that public firms are significantly more likely to hedge. Overall, our results are inconsistent with information asymmetry predictions.⁹

The coefficient on financial leverage, our proxy for financial distress motives of hedging, is positive, but insignificant. While theory suggests that highly leveraged firms should hedge to minimize the risk of default, the availability of hedging instruments could be limited for firms facing significant CR risk. Moreover, the ability to use debt is itself endogenous. In turn, this could explain the lack of statistical significance for leverage.

As predicted by agency models, we find that firms with risk-averse managers are significantly more likely to hedge (in line with evidence in Bodnar et al., 2016). We note that these results hold when controlling for the nature of management compensation. We also find that risk managers with an MBA or another master's degree and younger managers are more likely to work at firms with a risk management program. Overall, these findings suggest that education and younger age could facilitate hedging by exposing managers to financial innovation. We do not find evidence of a significant effect of experience on hedging.

⁸ The evidence that financially constrained firms (small, unrated, and nondividend payer) are less likely to hedge is consistent with the theoretical insights in Rampini and Viswanathan (2010, 2013). These authors demonstrate theoretically that lack of collateral could lead financially constrained firms to hedge less. However, we do not find that cash holdings, a commonly used form of collateral in derivatives transactions, play an empirically important role in a firm's propensity to hedge.

⁹ We acknowledge that this conclusion hinges on the accuracy of our measures of information asymmetry. If, for example, large firms are complex and complexity leads to greater information asymmetry, our evidence would then be consistent with DeMarzo and Duffie (1995).

Table V, Column 6, reports the estimation results for the financial firms. Most of the factors that affect the establishment of a risk management program have the same signs for the estimated coefficients, although, in general, they are statistically insignificant. The significantly negative coefficient for CR lines is an exception. In line with Froot et al. (1993) and Holmström and Tirole (2000), this suggests that access to liquidity substitutes for risk management for financial firms.

A. Rankings of the Factors Driving Corporate Risk Management Decisions

To complement our regression analysis, we ask respondents to rank the factors that are most important to their hedging decisions. Figure 2 summarizes the factors that rank as “important” or “very important” (a 3 or 4, respectively, on a scale from 1 to 4). For nonfinancial firms (Panel A), respondents indicate that “Increase Expected Cash Flows” is the primary reason for a risk management program (87%). Relatedly, nearly 80% say that “Increase Firm Value” is an important driver of risk management. Given its importance in the theoretical risk management literature, it is worth noting that two-thirds say that “Improve Investment in Difficult Times” is important or very important, though this is less than a number of other factors listed in Figure 2.

Other factors also play an important role in corporate hedging decisions. Note that 82% of respondents say that they hedge because shareholders expect their firms to do so. Panel A further reports that more than 80% indicate that “Decrease Unexpected Losses” is an important risk management determinant. Relatedly, more than 70% say that “Reduce Cash Flow Volatility” and “Improve Earnings Predictability” are important. Overall, these findings suggest that smoothness and the predictability of cash flows and earnings is among the main reasons that firm’s hedge. As Panel A illustrates, other factors, such as decreasing the cost of equity, share price volatility, and increasing debt capacity are less important.

The evidence for financial firms is similar. As Panel B demonstrates, about 90% of financial firms say that “Decrease Unexpected Losses” and “Satisfy Shareholders’ Expectations” are the two main reasons for hedging. “Increase Firm Value” and “Increase Expected Cash Flows” rank also very high, with 83% and 75%, respectively. One significant difference between financial and nonfinancial firms is with respect to the role of hedging for CR ratings, with 81% of the financial firms indicating that they hedge to increase/maintain ratings, relative to 65% of the nonfinancial firms.

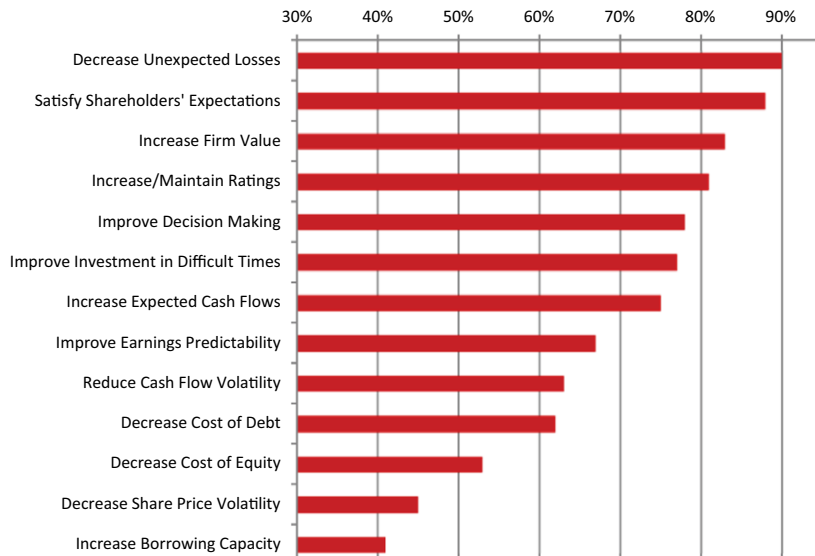
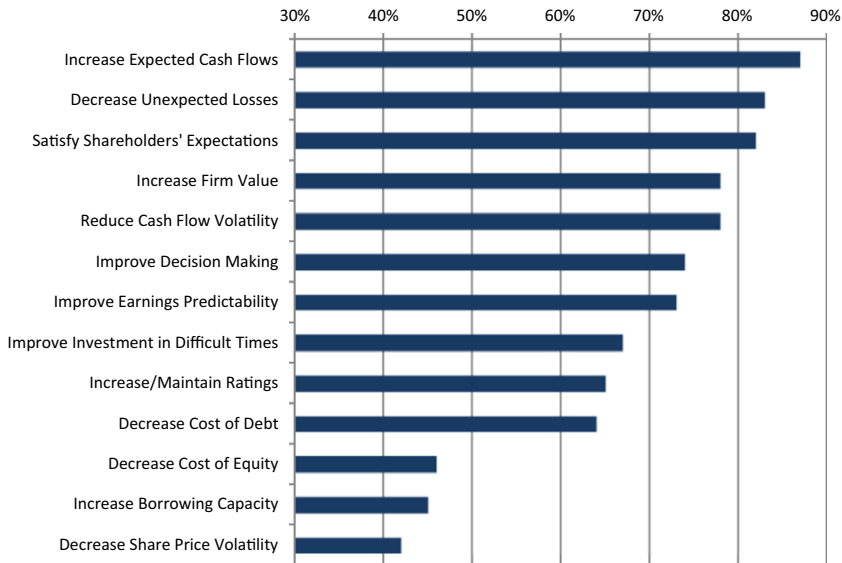
Our hope is that these findings will help researchers identify new motives for corporate risk management. For example, for nonfinancial firms “Increase Expected Cash Flows” is the single most important reason for hedging. This finding is consistent with the general argument in existing theories of risk management that hedging creates value by mitigating market friction (e.g., CR rationing, information asymmetry, risk of financial distress, etc.).¹⁰ However, our evidence and previous empirical studies suggest that support for the channels proposed by these theories is limited.

We believe that future theoretical and empirical work should focus on new channels through which hedging can help create firm value by increasing cash flows, lowering earnings volatility, satisfying shareholders’ expectations, and improving the decision making process. An interesting example is Purnanadam (2008). This author finds that in a dynamic setting, it is optimal for firms in financial distress to hedge (even without a precommitment to do so) as, by hedging, these firms stabilize their financial situation and, as a result, are able preserve their market share and boost their earnings. This link between hedging and performance is consistent with the evidence in Figure 2 that one of the primary reasons for hedging is to increase expected cash flows.

¹⁰ Hedging viewed broadly could increase expected cash flows if it reduces expected costs more than expected revenues. Executives could also expect cash flows to increase if they use hedging instruments for speculative purposes.

Figure 2. Percentage of Respondents Indicating Factor as Important or Very Important for the Decision to Have a Risk Management Program

The data are from our survey, which was conducted in the first quarter of 2010. Panel A. Nonfinancial firms. Panel B. Financial firms.



B. What Limits Corporate Hedging? Concerns, Crises, Internal Controls, and Regulation

In this section, we use unique features of our survey data to study how market conditions, regulation, and accounting standards affect corporate risk management.

1. Corporate Concerns about Hedging

We begin by analyzing factors that cause concern with respect to the use of derivatives (see Panel A, Table VI). Seventy-eight percent of firms say that “market risk” (risk of unforeseen changes in the value of derivatives) is a moderate or major concern, as do 68% regarding “counterparty CR risk related to derivatives.” Respondents indicate that a number of other issues concern them about hedging, though the following items lean more toward “moderate” concerns: monitoring and evaluating hedge results and secondary market liquidity. The last column of Panel A presents a weighted average level of concern score for each issue related to derivative use. The score is based upon a scale with four being high concern and one being no concern. It is clear, “market risk of derivative values” is the area of concern with the highest overall score. This is the most pressing concern related to derivatives usage for these firms.

While the rankings of concerns are similar for financial firms (see Panel B), the magnitude of concern is higher for financial firms. Similarly, firms outside of North America have greater concerns about hedging than North American firms.

This question is identical to the one asked in the 1998 Wharton survey of US nonfinancial firms. In Figure 3, we compare results from our North American nonfinancial firms to a comparable sample from the Wharton 1998 survey. Two things jump out. First, the percentage of firms reporting high concern about any of these areas today is lower than in 1998 suggesting that overall concern about derivative issues is lower today than in 1998. In addition, in 1998, concern about accounting treatment and monitoring and evaluating hedges were much larger concerns.

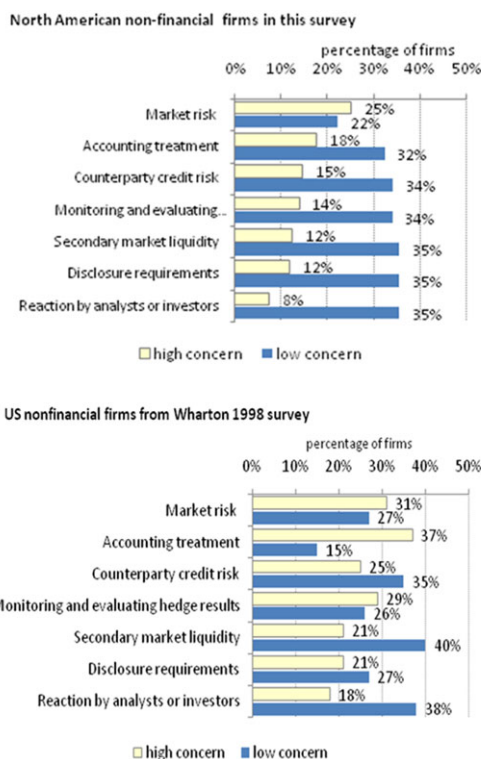
2. Effects of the Financial Crisis

We ask whether the global financial crisis of 2008–2009 has affected corporate hedging, possibly due to experiences with collateralized debt obligations and CR default swaps. Interestingly, the reaction is split. Note that 27% of firms indicate that the crisis caused them to decrease their usage, while 23% said that it caused them to increase their usage. The remaining firms (50%) indicate that it had no effect. Financial firms were more likely to state that it caused them to decrease usage (35%) relative to increase usage (28%), while nonfinancials were evenly split at a 20% increase and a 20% decrease. Geographically, a majority of foreign firms were more affected, but with decreases (36%) outpacing increases (29%), while North American firms were again slightly more likely to decrease than increase (24% vs. 20%).

3. Internal Controls

We also inquire about the internal controls of corporate derivatives with respect to marking-to-market and reporting of activities. As shown in Table VII, financial firms predominantly (63%) value (mark-to-market) their positions daily, while the most common horizon for nonfinancial firms is monthly (42%). About 11% of the firms report having no fixed schedule for the valuation of financial derivatives with this skewed more toward nonfinancial firms. There is relatively less difference in response patterns on a geographic basis with foreign firms tending toward more frequent valuation.

Figure 3. Concerns about Derivatives – Comparison with the Wharton 1998 Survey Responses



When asked to identify the main source of information for marking to market their derivative positions, 38% of the firms indicated they used the original derivatives dealer, 33% stated that they did the valuation themselves internally, and 27% indicated that they used a dealer other than the than the originating dealer.

We then asked to whom information about derivatives activity is reported within the firm. Note that 81% of respondents say that they report financial derivatives positions and activity to senior management with 50% reporting only to senior management and 29% also reporting to the Board of Directors. While 46% indicated that they report to the Board of Directors, only 13% did so exclusively. Only 6% of respondents indicated reporting on financial derivative activity to some other party or parties.

4. Regulation

We explore the corporate view on derivatives regulation. Currently, both Financial Accounting Standards Board (FASB) standards in the US and International Financial Reporting Standards (IFRS) standards globally mandate that firms periodically test the effectiveness of their derivative positions in terms of hedging the underlying exposure. We ask whether hedging effectiveness tests affect the frequency with which companies use financial derivatives. For the vast majority (76%), these mandated tests have no impact on the firms' use of financial derivatives. However, 16% of

Table VI. Degree of Concern with Issues Related to Derivative Use

Panel A. All Responses, n = 601

Area of Concern	High Concern	Moderate Concern	Low Concern	No Concern	Concern
Score*					
c. Market risk (unforeseen change in value of derivative)	39%	39%	15%	7%	3.10
b. Counterparty credit risk	31%	37%	22%	10%	2.89
e. Monitoring and evaluating hedge results	23%	41%	26%	11%	2.75
d. Secondary market liquidity	23%	39%	24%	14%	2.71
a. Accounting treatment	21%	35%	27%	16%	2.60
g. Disclosure requirements	14%	31%	30%	24%	2.36
f. Reaction by analysts or investors	11%	32%	31%	26%	2.28

*Concern score is weighted average with high concern = 4, moderate concern = 3, low concern = 2 and no concern = 1

Panel B. Concern Score by Subgroup

Area of Concern	Financial <i>n</i> = 254	Nonfinancial <i>n</i> = 348	North American <i>n</i> = 266	Foreign <i>n</i> = 335
c. Market risk (unforeseen change in value of derivative)	3.28	2.97	2.95	3.22
b. Counterparty credit risk	3.23	2.65	2.74	3.02
e. Monitoring and evaluating hedge results	2.87	2.67	2.57	2.90
d. Secondary market liquidity	3.02	2.49	2.53	2.85
a. Accounting treatment	2.72	2.52	2.53	2.66
g. Disclosure requirements	2.48	2.27	2.28	2.41
f. Reaction by analysts or investors	2.45	2.16	2.14	2.40

the responding firms indicated that they had reduced their use of financial derivative contracts because of these tests. Among those firms that decreased derivative usage, approximately 60% indicated that the result was an overall decrease in hedging activity, while 40% indicated a shift toward nonfinancial hedging methods. The pattern of responses to the entire question is very similar across the sector and geographic subgroups. Overall, these results suggest that mandated hedging effectiveness tests only had a modest effect on corporate risk management.

We also explore changes in regulations resulting from the financial crisis (e.g., Dodd-Frank Act of 2010). One possible change restricts customized OTC derivatives with a move to standardized, exchange-traded contracts. As presented in Table VIII, Panel A, a majority (54%) of the

Table VII. Frequency of Derivative Valuation

Frequency	All respondents <i>n</i> = 595	Financial Firms <i>n</i> = 254	Nonfinancial firms <i>n</i> = 341	North American firms <i>n</i> = 263	Foreign firms <i>n</i> = 332
Daily	34%	63%	13%	27%	40%
Weekly	12%	9%	13%	9%	14%
Monthly	31%	17%	42%	36%	27%
Quarterly or less	12%	5%	17%	16%	8%
No schedule	11%	6%	15%	11%	11%

Table VIII. Reaction to Possible Changes in Regulatory Rules for Derivative Instruments

Impact on a Firm's Usage of Derivatives	All Respondents <i>n</i> = 604	Financial Firms <i>n</i> = 256	Nonfinancial Firms <i>n</i> = 348	North American Firms <i>n</i> = 265	Foreign Firms <i>n</i> = 339
Increase in usage	10%	15%	7%	6%	13%
No change in usage	54%	39%	66%	65%	47%
Decrease in usage	32%	43%	24%	28%	36%
Discontinue usage	3%	3%	3%	2%	4%

Impact on a Firm's Usage of Derivatives	All Respondents	Financial Firms	Nonfinancial Firms	North American Firms	Foreign Firms
Increase in usage	6%	9%	3%	4%	7%
No change in usage	35%	38%	32%	33%	37%
Decrease in usage	52%	51%	53%	55%	50%
Discontinue usage	7%	2%	11%	9%	6%

respondents indicated that a restriction on OTC derivatives replaced by standardized exchange-traded contracts would result in no change in their derivative usage. While a small percentage (10%) indicated that such a move would increase their use of derivatives, the more interesting result is that 32% of firms indicated that such a regulatory change would reduce their use of derivatives with 3% stating that such a change would cause them to discontinue use of derivatives entirely.

Financial firms showed a greater propensity to react to such a policy change with a higher proportion indicating increased (15%) and decreased (43%) usage of derivatives in response. In contrast, 66% of nonfinancial firms confirm that this policy change would not affect their derivative usage and just 24% indicate that they would decrease derivative usage. Geographically, North American firms were less reactive than foreign firms were.

Table VIII, Panel B, explores the effect of potentially requiring firms to post cash collateral, or more collateral, than has traditionally been required against all OTC derivatives. For the full set of respondents, 52% stated that the requirement to post collateral on OTC instruments or post more collateral than traditionally has been required would result in a decrease in derivative usage. In addition, 7% indicated that such a move would cause them to discontinue derivative use entirely. Only 35% indicated that this policy would have no effect on their usage. These magnitudes are greater than those reported in the previous paragraph for restricting OTC instruments in favor

of exchange-traded instruments.¹¹ Interestingly, nonfinancial firms react more strongly (64% reacting with a decrease or discontinuation of derivatives) relative to financial firms (53%), and North American firms (64%) react more strongly than foreign firms (56%).

Overall, the evidence in this section suggests that market conditions and regulatory changes can affect corporate risk management policies. We hope these findings will help inform the current policy debate on margin requirements and other derivative market restrictions. We also hope these findings will stimulate future research concerning the effect of regulation and market conditions on corporate hedging.

IV. Details on Risks and Risk Management Policies

A. Levels and Changes in Material Risks

To understand the breadth and depth of the risks faced by the firms, we asked them whether they face “material” risk in each of the six following areas: 1) IR, 2) FX, 3) EN, 4) CM, 5) CR, and 6) GP. Figure 4(a) demonstrates that a majority of respondents report facing material risk in three of the six areas, IR (71% of respondents), FX (63%), and CR (56%). EN, CM, and GP were material risks for one-third or less of the respondents.

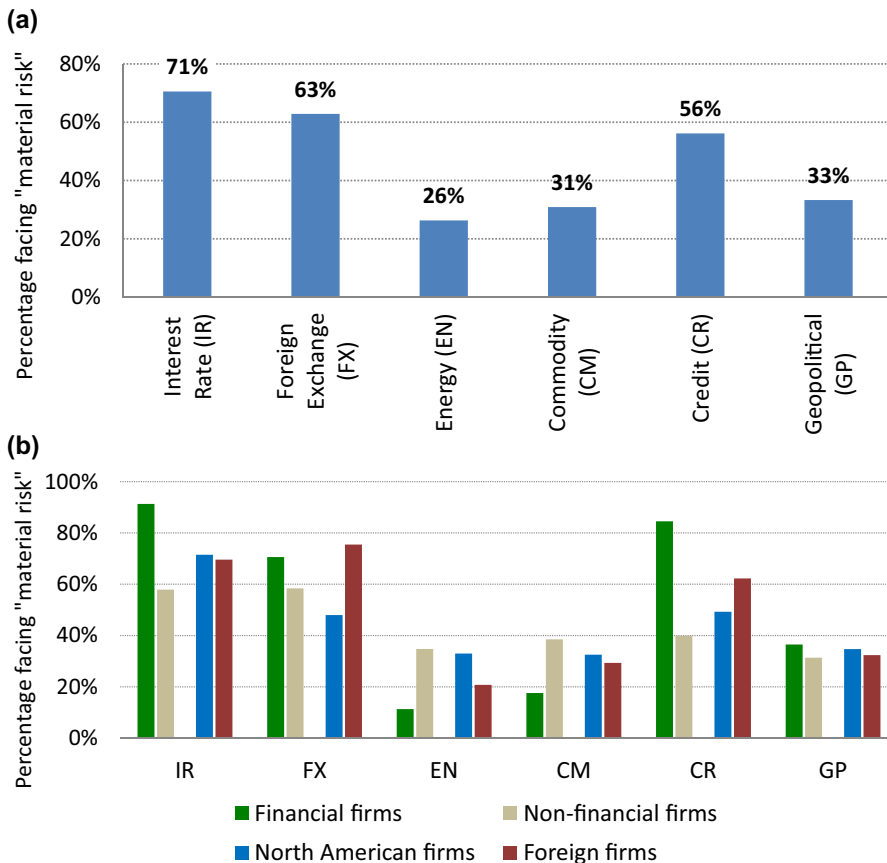
Figure 4(b) illustrates the results of this question for two sets of subgroups: 1) financial versus nonfinancial and 2) North American versus foreign (non-North American). Financial firms were notably more likely to indicate material risk in IR (91%), FX (85%), and CR (85%), while relatively fewer nonfinancial firms indicated material risk in IR and FX (58% and 59%, respectively) and CR (40%). Slightly more nonfinancial firms indicated material risk to EN (35%) and CM (39%) than for the full sample. Geographically, while similar percentages of North American firms and foreign firms felt material risk to IRs (64%), the big difference is in FX where fewer North American firms reported facing material risk (43%) compared to the foreign firms (69%). North American firms reported slightly higher percentages of material risk in the other areas except for CR where more foreign firms (57%) felt material risk compared to North American firms (44%).

For those firms facing material risk in a given area, we asked them to indicate whether they actively manage this risk either through derivatives/financial contracts or through operational structures and decisions. Figure 5 presents the percentage of firms facing material risk in each area that actively manage the risk in each manner. Interestingly, operational risk management is used by more firms in all of the risk areas except for FX, where the use of derivatives and financial contracts is more common. While derivatives/financial contracts are used by more than half of the firms in only three risk areas, operational risk management is used by at least two-thirds of the firms in all of the risk areas. This suggests that risk management is more often handled via operational changes than through financial contracts.

For the subgroups, financial firms reported broadly similar results with CM in addition to FX risk as more commonly managed with derivatives /financial contacts than operations (CM = 82% vs. 72%, FX = 82% vs. 64%). For nonfinancial firms, operational risk management is more common than financial risk management in all areas with IR and FX as the only risks managed with derivatives/financial contracts by more than half of the firms (61% and 67%, respectively), while 69% or more of the firms facing risks actively managed them through operations. Across the board, the nonfinancial firms are less likely than the financial firms to use derivatives/financial

¹¹ As we will see later, this may be related to the fact that a majority of firms prefer OTC instruments to exchange-traded ones.

Figure 4. (a) Firms Facing Material Risk – By Risk Area. (b) Firms Facing Material Risk – By Subsample



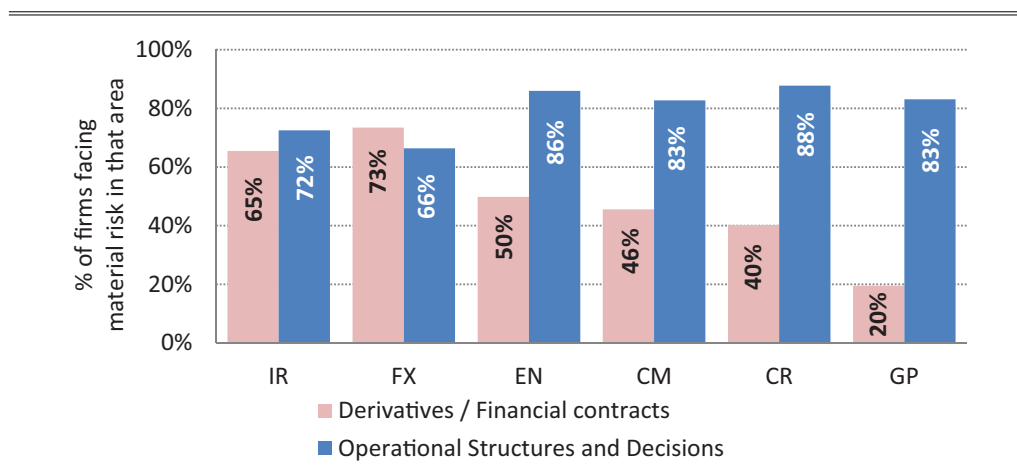
contracts to manage their material risks. Geographically, no differential patterns emerged as operational risk management was more common than derivatives/financial contracts in all areas except FX.

Combining these two sets of responses, we determine the percentage of firms that indicate that they face a material risk, but do not indicate that they actively managed this risk. The survey responses suggest that in most risk areas, a relatively small percentage of firms that report they face a material risk do not (or did not tell us) indicate that they actively managed that risk. For FX risk, only 9% of firms who indicate that they face material FX risk do not indicate any active risk management responses. This proportion trends up slowly and then balloons to 24% for GP risk. Notwithstanding, the vast majority of firms facing a material risk have some sort of active risk management strategy.

The next question measures the perception as to how the level of risk in these areas is evolving. We ask the respondents to indicate their perceptions of how the level of risk in the areas that they face material risk has changed relative to 2006 (prior to the global financial crisis).

Figure 5. Firms Managing Material Risk

The types of risk that we consider are Interest Rate, Foreign Exchange, Energy, Commodity, Credit, and Geopolitical.

**Table IX. Perception of Risk and Risk Management**

Panel A reports the percentages of CFOs indicating that they perceived each risk type to increase, remain the same, or decrease over the period 2006–2010. The types of risk that we consider are Interest Rate, Foreign Exchange, Energy, Commodity, Credit, and Geopolitical. Panel B reports the percentages of CFOs indicating that the level of risk management by risk type increased, remained the same, or decreased over the period 2006–2010.

Panel A. Perceptions of Change in Levels of Risk (2006–2010)

Risk	IR	FX	EN	CM	CR	GP
Increase	57%	62%	54%	54%	70%	54%
Same	22%	27%	36%	37%	19%	38%
Decrease	21%	11%	10%	9%	11%	8%
Num	919	804	481	502	744	515

Panel B. Changes in Levels of Risk Management (2006 to 2010)

Risk	IR	FX	EN	CM	CR	GP
Increase	63%	62%	50%	54%	72%	48%
Same	31%	33%	47%	43%	24%	48%
Decrease	7%	5%	4%	4%	4%	4%
Num	907	784	479	499	730	509

Table IX, Panel A, provides the responses. A majority of firms in each risk category indicate that they perceive the level of risk as of the survey time (Spring 2010) to have increased relative to 2006. CR risk was perceived as having increased by the largest percentage of firms. This is not a surprise given its role in the global financial crisis. On the other end of the spectrum, IR risk stood out with more than 20% of the respondents indicating that they perceived it had decreased

Table X. Most Important Risk, $n = 1,161$

This table reports the percentages of CFOs indicating that their firm faces a certain risk type independently from whether this risk is material and conditional on the risk being material for the whole sample (Panel A) and by subgroups (Panel B). The types of risk that we consider are Interest Rate, Foreign Exchange, Energy, Commodity, Credit, and Geopolitical.

<i>Panel A. All Respondents</i>						
	Risk Area					
	IR	FX	EN	CM	CR	GP
As % of “most important” votes	25%	20%	9%	13%	26%	7%
As % of firms with material risk	38%	33%	37%	44%	51%	22%

<i>Panel B. By Subgroups</i>						
	Risk Area					
	IR	FX	EN	CM	CR	GP
As % of “most important” votes						
Financial firms	37%	9%	1%	1%	46%	5%
Nonfinancial firms	18%	26%	14%	19%	16%	7%
North American firms	29%	15%	10%	17%	21%	7%
Foreign firms	21%	24%	8%	9%	31%	6%
As % of firms with material risk						
Financial firms	42%	13%	5%	7%	57%	15%
Nonfinancial firms	34%	48%	44%	54%	43%	26%
North American firms	45%	34%	34%	56%	48%	23%
Foreign firms	32%	33%	41%	32%	53%	19%

relative to 2006. Financial firms were more likely to have perceived risk increases in IR, FX, and CR, while nonfinancial firms report increases in EN and CM. There was little difference in responses based on the geographical breakdown.

The natural follow-up question asks the respondents about the change in the degree or intensity of their firm’s risk management activity over the same period. Not surprisingly, the responses shown in Table IX, Panel B, are very similar, as most firms responded to the perception of increased levels of risk with increases in the degree of risk management activity. Only a small percentage of firms indicate that they reduced the intensity of their risk management activity (in any of the areas) relative to 2006.

The final question on changes in risk concerned the impact the global financial crisis had on the firm’s overall approach to risk management. The overwhelming majority of respondents, 81%, indicate that the crisis caused them to pay more attention to risk management issues. This percentage was slightly higher for financial firms and for foreign firms. Almost all of the rest indicated that it had no impact on their risk management activities.

B. Importance of Risk Areas

In order to gauge which risk is the most important to these respondents, we ask them to rank the top three risks they face in order of importance. As displayed in Table X, Panel A, in terms of the

number of most important votes, the top spot is held by CR with 26% of respondents indicating it is the most important risk they face. IR risk is a close second with 25% of the top spot votes and FX retains the third with 20% of the top votes. The other three risks all score lower in the top spot votes with 15% or less of the firms ranking them as the most important risk.

The ranking of the most important risk differs notably across the subgroups. Table X, Panel B, indicates that for financial firms, only two risks rank as highly important: CR with 46% and IR with 37%. No other risk received 10% of the top spot votes from the financial firms. For the nonfinancial firms, FX risk has the most top spot votes (26%) with CM (19%) and IR (18%) next in line. As for the geographic breakdown, more North American firms rank IR as the most important risk (29%), while foreign firms expressed greater concern with CR (31%) and FX (24%).

We see a different outcome in terms of importance when we consider the ranking of the most important risk as a percentage of just those firms indicating material risk in each area. Panel A of Table X also reports the rankings for most important risk conditional upon only those firms indicating material risk in that area. For the full sample, CR still comes out on top with 51% of firms facing CR risk indicating that CR is their most important risk. The next highest percentage relates to CM (44%) followed by IR (38%) and EN (37%). In risk areas faced by a smaller subset of firms, these firms are more likely to see that particular risk as their most important risk. This pattern carries over into the subsample analysis displayed in Table X, Panel B. CR risk (57%) and IR (42%) are still the most prevalent for financial firms under this measure. However, the majority of nonfinancial firms facing CM risk (54%) considered it their most important risk, followed closely by FX (48%) and EN (44%). CR risk is also the top concern among those facing this risk among the North American firms (56%), while for the foreign firms, nearly half with EN risk exposure (41%) rated it their most important risk. In all cases, GP risk has the lowest percentage of firms indicating it was the most important risk facing the firm. Thus, although CR, IR, and FX are the most prevalent risks in the sample, in terms of concern, the CM and EN risks are equally if not more concerning to the smaller set of firms that face material risk in these areas.

C. Overall Risk Management Programs

In this section, we summarize responses to questions about the firms' overall risk management programs. The first question is whether the firm has a formal documented risk management program. Of the full set of responses, 65% of firms confirm that they have a formal documented risk management program, while 35% indicate that they did not. This proportion is largely driven by financial firms, 87% of which have a documented risk management program. For nonfinancial firms, 53% report having a documented risk management program.

Another important issue with respect to risk management policy is how frequently results are reported to and reviewed by oversight bodies within the firm. We asked the respondents whether their firm has a regular schedule for reviewing and reporting its risk management strategy. Seventy-two percent indicate a regular schedule, 90% of which are the same firms that indicated above that they have a formal documented risk management policy. In terms of the frequency of this reporting, the most commonly indicated frequency is quarterly (43%), followed by monthly (27%) and annually (13%). Results regarding the subgroups are generally similar. Financial firms have a significantly higher percentage with a regular reviewing and reporting schedule and there is a slight shift toward a higher frequency.

Academics have developed a variety of economic explanations as to why firms should manage risk. One set of these relate to hedging to avoid imperfections in the markets related to financing investments or obtaining liquidity. To investigate the extent to which practitioners think in similar

Table XI. What Assumption Do You Most Commonly Make about the Future Price Distribution When Doing Scenario Analyses or Financial Simulations? $n = 1,095$

Assume a normal distribution with mean and variance taken from historic data.	28%
Assume a normal distribution with mean and variance from some other source (estimated or market implied forecasts).	21%
Modify a normal distribution with assumptions to make it more conservative (e.g., treating the 5% tail as if it were the 10% tail).	19%
Assume a non-normal distribution that allows for fatter tails and potential skewness.	16%
Let the historic data determine the shape of some arbitrary distribution.	13%
Other.	3%

ways, the survey asks some questions about whether their risk management program improves financing for investments or access to liquidity. The first question asks whether their risk management program enhances the firm's ability to fund attractive investment opportunities. Forty-six percent indicated that it does, while 54% indicated that it does not suggesting that a majority of firms do not recognize any link between risk management and future financing challenges. Only for financial firms did a majority (57%) indicate that such a link was important. In a follow-up question, 46% of responding firms indicate that risk management did involve some thought to the firm's ability to fund future investment opportunities, 49% report that risk management helped to better match the availability of internal funding sources to the need for funds for investments, while 27% state that risk management helped to better match their access to external funding sources to the need for funds to make investments, and the remaining 24% indicate that risk management helped to reduce the cost of external funding for investments. These proportions do not differ substantially across the subgroups.

It is well known that a good substitute for active risk mitigation is access to a large pool of liquid assets. As such, we ask firms whether the size of their surplus cash holdings or access to guaranteed lines of CR influence the breadth or intensity of their risk management activities. Once again, the majority of firms (56%) said that their cash positions or access to lines of CR have no impact on their risk management policy. Interestingly, of the firms that did indicate an effect, a follow-up question confirms that both greater surplus cash holdings and access to guaranteed lines of CR result in an increase in the breadth or intensity of risk management activities for a larger number of firms than result in a decrease. Again, these results are quite uniform over the subgroups.

In two final academic questions on risk management programs, we ask firms for their view on the breakdown of the risk reduction from their risk management program between idiosyncratic risk (risk that is firm specific and uncorrelated with priced risk factors) and systematic risk (risk that is common across assets and carries with it a risk premium in terms of expected return). Interestingly, the average breakdown is that the risk reduction is 58% systematic risk and 42% idiosyncratic risk. Surprisingly, these averages did not vary much across the subgroups. This is interesting because with the exception of CR, most of the risks that firms are managing have exposures that are relatively firm-specific and do not have a significant risk premium in terms of the hedging costs. The other question relates to the assumptions firms make about the future price distribution when assessing future outcome risk from an exposure (e.g., as part of a Value at Risk exercise or a spreadsheet simulation).

The survey offers a series of likely possibilities and the firms' responses are displayed in Table XI. The most common response is the use of a simple normal distribution with a mean and variance based on historical data (28%). This is troubling as we know the tail issues are a critical

issue in risk management. Equally worrisome is that assuming a normal distribution with the mean and variance taken from some other source was the selection of another 21% of the respondents. Nineteen percent of the respondents indicate that they modify a normal distribution to worry about fat tails, while another 16% used a nonnormal distribution with fatter tails and potential skewness. Finally, 13% let the data define an arbitrary distribution and 3% do something akin to a combination of these methods. Thus, despite what the recent financial crisis taught us about simple distributional assumptions, nearly 50% of the respondents indicate that they basically use a normal distribution when doing simulations involving future financial prices.

The final question in this section asks firms whether they use financial derivatives (specifically forwards, futures, options, and/or swaps) in their risk management program. Panel A of Table XII reports the results for the full sample. For the full sample, 64% of the respondents indicate that they use financial derivatives in their risk management program.

Since this is probably the most commonly asked question in risk management surveys, we consider a variety of cross tabulations of this result with our firm demographics. Panel B of Table XII presents the cross tabulation of the responses by the geographic location of headquarters and economic sector with the non-financial sector also broken down into primary product, manufacturing, and service sectors. Financial sector firms report derivative usage as part of their risk management program in much higher proportions (78%) than the nonfinancial firms (56%). Geographically, foreign firms report derivative usage at a 10% higher proportion than the North American firms (68% vs. 58%). These results are consistent with findings of previous surveys. Derivative usage in European countries has typically been much higher than in the United States (Bodnar and Gebhardt, 1999; Bodnar, de Jong, and Macrae, 2003). In cross tabulations, prevalence of financial derivative use is highest among foreign financial firms at 81% and lowest among the North American nonfinancial firms at 54%. This latter number compares closely with the findings in Bodnar et al. (1998) who report that derivative usage among US nonfinancial firms in the mid to late 1990s varied between 35% and 50%. Slightly more than a decade later, the derivatives usage rate for nonfinancial-North American firms in our sample is 54%.

The pattern of usage across the nonfinancial sectors is also consistent with the earlier survey findings (Bodnar et al., 1996). Usage is most prevalent in the primary products sector (basic materials, utilities, and transportation) with 71% of firms, followed by the manufacturing sector with 67% of firms, and the service sector firms with only a minority of firms (46%) using derivatives as part of their risk management program. The differences in these results on a regional basis are relatively minor. The only exception is that the proportion of foreign service sector firms using derivatives is nearly 10% higher than the percentage of North American service sector firms using derivatives.

In Panel C of Table XII, the usage of financial derivatives is broken down by firm size measured in USD sales. The results reveal a perfectly monotonic relation between the six firm size groups and the percentage of firms in each group that use financial derivatives. Among the smallest firms (those with sales of less than \$25 million USD), only 35% used financial derivatives with the percentage growing consistently as we move up the size groupings. Among the firms in the largest size grouping (those with sales of more than \$5 billion USD), 85% indicate that they use financial derivatives. This finding matches the common finding in previous studies in that firm size is positively related to the likelihood of using derivatives.

In the last two panels of Table XII, we report the proportion of firms indicating derivatives usage by the ownership form of the business (Panel D) and their CR rating (Panel E). As for ownership structure, respondents are asked to classify their firms into one of four classes of ownership: 1) publicly traded, 2) private, 3) government-owned, or 4) nonprofit. The results suggest that this

Table XII. Firms Indicating That They Use Financial Derivatives in Their Risk Management Program

<i>Panel A. Full Sample</i>							
<i>n</i> = 1,161		Yes				No	
		64%				36%	
<i>Panel B. By Geographic Region and Economic Sector</i>							
		All Regions		North America, <i>n</i> = 525		Foreign, <i>n</i> = 609	
		Yes	No	Yes	No	Yes	No
Financial sector firms	<i>n</i> = 404	78%	22%	72%	28%	81%	19%
Nonfinancial sector firms	<i>n</i> = 730	56%	44%	54%	46%	59%	41%
<i>Primary product sector firms</i>	<i>n</i> = 109	71%	29%	72%	28%	70%	30%
<i>Manufacturing sector firms</i>	<i>n</i> = 229	67%	33%	68%	32%	64%	36%
<i>Service sector firms</i>	<i>n</i> = 392	46%	54%	42%	58%	51%	49%
		All Sectors		58%	42%	68%	32%
<i>Panel C. By Firm Size - \$ Sales (2009 dollars)</i>							
(<i>n</i> = 1,077 with usable responses)				Yes		No	
< \$25M		<i>n</i> = 115		35%		65%	
USD 25M – 99M		<i>n</i> = 157		44%		56%	
USD 100M – 499M		<i>n</i> = 260		54%		46%	
USD 500M – 999M		<i>n</i> = 114		76%		24%	
USD 1.0B – 4.9B		<i>n</i> = 179		80%		20%	
USD 5.0B and more		<i>n</i> = 252		85%		15%	
<i>Panel D. By Ownership Structure</i>							
<i>n</i> = 1,080 with usable responses				Yes		No	
Publicly Traded		<i>n</i> = 427		78%		22%	
Private		<i>n</i> = 515		53%		47%	
Government Owned		<i>n</i> = 87		70%		30%	
Nonprofit		<i>n</i> = 51		43%		57%	
<i>Panel E. By Credit Rating</i>							
<i>n</i> = 917 with usable responses				Yes		No	
AAA		<i>n</i> = 118		72%		28%	
AA		<i>n</i> = 228		65%		35%	
A		<i>n</i> = 181		69%		31%	
BBB		<i>n</i> = 153		73%		27%	
BB		<i>n</i> = 83		76%		24%	
< BB		<i>n</i> = 69		57%		43%	
Not Rated		<i>n</i> = 85		47%		53%	

Table XIII. Most Important Reasons for Not Using Financial Derivatives, $n = 380$

	Num.	%
a. Insufficient exposure to financial or commodity prices	132	34%
b. Exposures are more effectively managed by other means	71	31%
g. Costs of establishing and maintaining a derivatives program exceed the expected benefits	56	25%
c. Difficulty pricing and valuing derivatives	41	18%
f. Concerns about perceptions of derivative use by investors, regulators, and the public	31	13%
h. Other	30	13%
e. Accounting treatment	14	6%
d. Disclosure requirements of the SEC or the FASB	9	4%

is an important characteristic in explaining whether a firm uses derivatives. It turns out that use of derivatives is most prevalent among publicly traded firms at 78%, with government-owned firms next at 70%. Privately held firms are notably less likely to use derivatives with only 53% indicating use, while nonprofits report the lowest proportion of use at 43%. As for CR ratings, of the 917 firms that provided this information, there is an interesting relation between derivative usage and CR ratings. All of the firms with ratings of BB and above use derivatives in greater frequency than the sample as a whole. Interestingly, the heaviest percentage users are the bottom two groups in this category, BBB and BB at 73% and 76%, respectively. Firms rated less than BB, as well as those that indicate they are not rated, are less likely to use derivatives at 57% and 47%, respectively.

There was a follow-up question for firms who indicated that they did not use financial derivatives in their risk management program. Nonusers were asked to rank the top three reasons why they did not use financial derivatives from a preselected list. Table XIII displays these results. Three of the eight choices provided garnered most of the responses for the top reason. The most important reason, with 34% of the most important votes, is that the “firm’s exposure to the financial price risk was not sufficient to warrant using derivatives.” This is followed with 31% of the top votes by the equally rational “exposures are more effectively managed by other means.” The other top vote getter, with 25%, is the individual cost-benefit assessment by the firms that the “costs of establishing and maintaining a derivatives program exceed the expected benefits.” Among the firms that selected “other” as the most important reason for not using derivatives, the reasons most commonly provided relate to a lack of a local market for derivatives, legal restrictions against holding derivatives, or a lack of expertise with derivatives. The choices that relate to outside perception or issues with pricing, accounting, or disclosure requirements appear to be much less of a deterrent to firms using derivatives in their risk management program. Results by sector and geographic area are again quite comparable.

D. The Management of Specific Risk Areas

In the remainder of the survey, we ask firms specific questions regarding risk management in the individual areas of risk that they faced. In order to reduce survey fatigue for firms that faced more than two risks, respondents were randomized as to which risk sections they were asked to respond to so the sample sizes for these subsections are smaller than the number of firms that indicated that they faced each risk.

Table XIV. Firms That Have Frequently or Sometimes Used Interest Rate Derivatives in Past Three Years for the Following Purposes

Use of Interest rate derivatives to . . .	All Respondents <i>n</i> = 502	Financial Firms <i>n</i> = 224	Nonfinancial Firms <i>n</i> = 266
a. Swap from a fixed rate to a floating rate	44%	68%	25%
b. Swap from a floating rate to a fixed rate	58%	65%	54%
c. Fix in advance the rate or spread on new debt	45%	51%	39%
d. Reduce or lock in a rate based upon market view	47%	56%	40%

1. Interest Rate Risk Management

The IR risk management section was viewed by the set of firms that indicated that they faced material IR risk. Of this group, 514 firms responded to at least one question in this section.

To investigate the kinds of exposure firms are managing with IR derivatives, we began by asking firms to indicate how frequently they use IR derivatives to accomplish certain IR risk management activities. We offer four common purposes for IR derivative transactions and ask firms to indicate if they did these transactions “frequently,” “sometimes,” or “seldom/never” within the past three years. Table XIV displays the sum total percentages of the “frequent” and “sometimes” responses, as well as their breakdown into financial and nonfinancial subgroups. The responses suggest the most common IR derivative activity is entering contracts to swap from floating to fixed IRs with 58% indicating they do so “frequently” or “sometimes.” The other activities including swap from a fixed rate to a floating rate, fix in advance the rate or spread on new debt, and reduce or lock in a rate based upon a market view are done “frequently” or “sometimes” by about 45% of the respondents. The breakdown of the sample into financial and non-financial firms reveals several distinctions. Financial firms are much more likely to use IR derivatives “frequently” or “sometimes” to do almost all of these activities compared to nonfinancial firms. In addition, financial firms are most likely to swap from a fixed to a floating rate than nonfinancial firms (68% vs. 25%) consistent with their activity of extending fixed rate loans to nonfinancial customers and then dealing with the IR risk by swapping into a floating rate.

Next, we ask firms to identify which IR contracts/positions they use to manage their IR risk. We provide seven different IR derivative contracts and one operational activity commonly used to manage IR risk as possible answers and ask the respondents to indicate if they use any of these to manage their IR risk. We also ask firms to indicate their most commonly used contract or activity. Table XV summarizes the full set of responses to these questions, as well as the financial and nonfinancial firm breakdown. For all respondents, the IR swap receives the largest percentage of firms indicating usage (67%). Forward rate agreements (45%) are the next most commonly used followed by varying the maturity of debt (32%), IR futures (30%), and option combinations (i.e., caps and collars) (26%). Less than 20% of the respondents indicate use of IR swaptions (18%), exchange-traded IR options (14%), and OTC IR options (13%). In terms of the most used method, the next column displays the percentage of firms indicating a position/activity as their most commonly used method.¹² The ranking of the top methods is very similar to the overall usage ranking.

¹² To determine the percentage of total respondents that ranked a particular method as their number one choice, simply multiply the use percentage and the ranked most used percentage.

Table XV. Use of Various Interest Rate Contracts/Positions to Manage Interest Rate Risk

Interest Rate Contracts/Positions	All Respondents <i>n</i> = 514		Financial Firms <i>n</i> = 238		Nonfinancial Firms <i>n</i> = 264	
	Use	Ranked as Most Used	Use	Ranked as Most Used	Use	Ranked as Most Used
c. Interest rate swaps	67%	71%	75%	63%	61%	81%
a. Forward rate agreements	45%	47%	52%	33%	38%	64%
h. Varying the maturity of the debt	32%	43%	36%	39%	28%	45%
b. Interest rate futures	30%	31%	50%	27%	13%	39%
g. Option combinations (e.g., caps, collars)	26%	13%	34%	7%	20%	50%
d. Interest rate swaptions	18%	13%	31%	6%	7%	25%
f. Exchange-traded IR option contracts	14%	8%	23%	4%	6%	24%
e. OTC IR options	13%	4%	24%	1%	4%	16%

Table XVI. Mix of Over-the-Counter and Exchange-Traded Interest Rate Derivatives

Mix	All Respondents <i>n</i> = 498	Financial Firms <i>n</i> = 237	Nonfinancial Firms <i>n</i> = 287	North American Firms <i>n</i> = 242	Foreign Firms <i>n</i> = 282
Over-the-counter only	35%	24%	45%	38%	32%
Mostly OTC	25%	30%	21%	20%	29%
Equal mix	12%	18%	7%	9%	15%
Mostly exchange-traded	14%	21%	9%	14%	16%
Exchange-traded only	13%	8%	18%	19%	8%

When reviewing the distinction between financial and nonfinancial firms, financial firms are much more apt to use swaps, forward rate agreements, and IR futures than nonfinancial firms. However, nonfinancial firms are much more diverse in their choices for the “ranked as most used” instrument as evidenced by the higher percentages in this column as compared to the financial firms. This pattern of most used in conjunction with the lower percentages in the use column suggests that nonfinancial firms are more likely to select a particular method for managing IR risk and stick to it.

Given the broad use of derivatives for IR risk management, we ask firms about their mix of OTC and exchange traded instruments. Table XVI presents the responses when the respondents were asked to indicate their choice between these two markets. For all of the respondents, 35% use only OTC IR instruments with another 25% using primarily OTC instruments. A mere 12% indicate that they had a roughly equal mix between the two, while only 13% indicate that they use only exchange-traded instruments. Results for the subgroups were relatively similar, though nonfinancial group are much more likely to be with OTC only or exchange-traded only, while the financial firms are more likely to use some combination of the two. Notably, North American firms are more than twice as likely to use exchange-traded only derivatives when compared to foreign firms (19% vs. 8%). With regard to OTC IR instruments, we also ask whether the

Table XVII. Influence of Market Conditions on Interest Rate Risk Management

<i>Panel A. Does the Shape of the Yield Curve Impact the Size or Amount of Your Interest Rate Hedge Positions?</i>					
	All Respondents n = 553	Financial Firms n = 248	Nonfinancial Firms n = 293	North American Firms n = 245	Foreign Firms n = 296
Yes	57%	75%	43%	48%	65%
No	43%	25%	57%	52%	35%

<i>Panel B. How Important is Your Firm's Forecast Outlook for Interest Rates for the Extent you Hedge IR Risk</i>					
	All Respondents n = 561	Financial Firms n = 248	Nonfinancial Firms n = 299	North American Firms n = 250	Foreign Firms n = 297
Very Important or Important	60%	71%	49%	54%	64%
Somewhat Important or Not Important	40%	29%	51%	46%	36%

instruments are generic or bespoke. Across the board, it is about an 80-20 split: 80% of the OTC instruments are generic (i.e., plain vanilla), while about 20% of the OTC instrument are bespoke (i.e., custom made).

To learn about possible influences on firms' IR risk management decisions, we ask whether the shape of the home currency's yield curve impacts the size or amount of the firm's IR hedge positions and how important the firm's forecast/outlook for IRs is for the extent the firm hedges IR risk. As reported in Table XVII, Panel A, 57% of the respondents indicate that the shape of the yield curve impacts their IR hedging decisions. These firms are predominantly financial firms or foreign firms, as less than 50% of the nonfinancial and North American firms indicate that the shape of the yield curve affects their IR hedging decisions. Table XVII, Panel B, presents a similar story regarding the importance of a market view on IRs for IR hedging decisions. Of the four possible responses, the table shows the percentage of firms indicating "very important" and "important" versus the percentage of firms indicating "somewhat important" or "not important." For all firms, 60% indicate that their market view on IRs is "very important" (18%) or "important" (42%) for the extent of their IR hedge positions. Reviewing the breakdown across subgroups, as with the yield curve question, we find that financial firms and foreign firms are much more likely to have their forecast of IRs influence their IR hedging than nonfinancial firms.

Finally, to gauge how firms measure the success of their IR risk management policy, we ask about the benchmark that firms use to evaluate their IR risk management performance. The survey offers five possibilities, three involving a cost of funds measure, one a volatility measure, and an "other" option, as well as a chance to indicate that they do not use a benchmark. Table XVIII provides the results. The most common choice is to compare the cost of funds relative to a benchmark, such as London Interbank Offered Rate (LIBOR) (43%). The second most common choice (for all columns except for the financial firms) is that the firm did not use a benchmark, which leads us to wonder how those firms evaluate IR risk management. The cost of funds relative to a target portfolio (specific fixed to floating ratio) is third most popular, while the duration targeting and volatility of interest expense are least commonly used. The results

Table XVIII. Benchmark for Evaluating Interest Rate Risk Management

Benchmark	All Respondents n = 498	Financial Firms n = 237	Nonfinancial Firms n = 287
a. Cost of funds relative to a target (fixed/floating) portfolio	35%	24%	45%
b. The volatility of interest expense relative to a target portfolio	25%	30%	21%
c. Cost of funds relative to an Index (e.g., LIBOR)	12%	18%	7%
d. Cost of funds relative to a target duration portfolio	14%	21%	9%
e. Our firm does not use a benchmark	13%	8%	18%

are basically similar across the subgroups though foreign firms demonstrate greater use of the target (fixed/floating) portfolio, while financial firms are more likely to use a duration target portfolio.

2. Foreign Currency Risk Management

The foreign currency risk management section was viewed by the set of firms that indicated that they faced material FX risk and that they managed that risk by either financial or operations means. Of this group, 540 firms responded to at least one question in this section. Questions in this section were broadly similarly to those in the IR risk management section.

To investigate what kinds of exposure firms are managing with FX derivatives, we ask firms to indicate how frequently they use FX derivatives to manage risk from a set of six corporate FX exposures. We ask firms to indicate if they undertook FX derivative transactions for any of these exposures “frequently,” “sometimes,” or “seldom/never.” Table XIX displays the sum total percentages of the “frequent” and “sometimes” responses for the full set of respondents, as well as breakdowns into financial/non-financial and North American/foreign subgroups. For the full set of respondents, with the exception of anticipated transactions in more than one year, all of the other exposures have a majority of firms indicating that they “frequently” or “sometimes” use FX derivatives to manage these risks. The highest percentage of firms (76%) indicates recorded commitments (i.e., booked transaction, such as receivables and payables). This is consistent with prior studies that examine FX risk management in finding that simple transactions are the most commonly hedged FX exposure (Bodnar et al., 1998). Also popular for FX derivative usage is anticipated transactions/investments within one year identified by 70% of firms. Obviously, the one-year horizon plays some important role as the anticipated transactions in more than one year had the lowest percentage of votes (48%).

When reviewing the responses by the subgroups, financial firms are notably more likely to use derivatives to hedge anticipated transactions in more than one year as compared to non-financial firms, while foreign firms are particularly less likely to hedge foreign repatriations and more likely to hedge contractual commitments (unbooked contracts) when compared to North American firms.

Table XX reports the responses from asking firms about which types of FX contracts and/or positions they use to manage their FX risk. The survey offered nine possible choices of derivative contracts and other FX positions and asked firms to indicate all that apply to their risk management

Table XIX. Firms That Have Frequently or Sometimes Used Foreign Currency Derivatives in Past Three Years to Manage Risk from . . .

Use of Foreign Currency Derivatives to Manage Risk from . . .	All n = 459	Financial n = 160	Nonfinancial n = 265	North American n = 147	Foreign n = 278
b. Recorded commitments (e.g., booked contracts)	76%	75%	76%	72%	77%
d. Anticipated transactions/investments within one year	70%	75%	67%	64%	73%
a. Foreign repatriations (e.g., dividends, royalties)	68%	69%	68%	73%	65%
c. Contractual commitments (e.g., unbooked contracts)	66%	70%	63%	55%	71%
f. Translation of foreign subsidiary financial statements	58%	62%	55%	58%	58%
e. Anticipated transactions/investments in more than one year	48%	59%	41%	43%	51%

program. Far and away, the winner is the FX forward contract. Sixty-four percent of all firms indicate that they use forward contracts in their FX risk management program. Only three other contracts/positions were selected by more than 30% of the firms. These are cross-currency swaps (38%), futures contracts (32%), and money market deposits/loans (31%). The only other choice that had more than a 20% response rate was foreign currency debt financing (27%). All of the other choices, exchange-traded options, option combinations, OTC options, and nondeliverable forwards, had usage rates of 17% or less.

In terms of the subgroups, the results suggest that the forward contract is the most common choice across every subgroup. Beyond forwards, financial firms are generally twice as likely to use all other FX contracts/positions as nonfinancial firms. Geographically, the differences are less substantial, but foreign firms are more likely to be users of forward contracts, money market hedges, OTC options, and nondeliverable forwards as compared to North American firms.

Table XX also reports the percentage of firms that rated each FX contract or position as their most commonly used instrument (as a percentage of firms that indicated they used that contract or position). Once again, the forward contract is the clear winner. Seventy-five percent of all of the respondents indicated the forward contract as their most commonly used contract (this translates into 204 of the 427 respondents). Other contracts or positions that are frequently rated as number one by their users include foreign currency debt financing (42% of users, 48 firms), money market hedging (37% of users, 50 firms), and cross-currency swaps (31% of users, 50 firms). The results on the subsamples are broadly similar with an even greater preference for the forward contract among nonfinancial firms and foreign firms.

As in the IR section of the survey, we ask firms about their mix of OTC versus exchange-traded instruments in their FX derivative portfolio. The responses to the OTC-exchange trade mix appear in Table XXI. More so than with the IR derivatives, FX derivative use by our respondents is tilted

Table XX. Use of Various Foreign Currency Contracts/Positions to Manage FX Risk

Use of Foreign Currency Contracts/ Positions (as percentage of all respondents)	All <i>n</i> = 427*					
	Use	Ranked as Most Used	Financial <i>n</i> = 180	Nonfinancial <i>n</i> = 240	North American <i>n</i> = 140	Foreign <i>n</i> = 280
a. Forward contracts	64%	75%	62%	66%	55%	69%
h. Cross currency swaps	38%	31%	54%	27%	36%	40%
c. Futures contracts	32%	25%	45%	23%	33%	32%
b. Money market deposits/loans	31%	37%	39%	25%	19%	37%
i. Foreign currency debt financing	27%	42%	29%	25%	27%	27%
f. Exchange-traded options	17%	15%	24%	13%	16%	18%
g. Option combinations (e.g., caps, collars)	17%	14%	22%	13%	17%	17%
e. OTC options	17%	21%	26%	9%	9%	20%
d. Non-deliverable forwards (NDFs)	15%	11%	22%	10%	9%	18%

Table XXI. Mix of Over-the-Counter and Exchange-Traded FX Derivative Instruments

Mix	All Firms <i>n</i> = 387	Financial Firms <i>n</i> = 179	Nonfinancial Firms <i>n</i> = 202	North American Firms <i>n</i> = 121	Foreign Firms <i>n</i> = 260
Over-the-counter only	39%	31%	47%	41%	38%
Mostly OTC	23%	30%	16%	20%	24%
Equal mix	12%	13%	10%	11%	12%
Mostly exchange-traded	14%	18%	11%	12%	16%
Exchange-traded only	12%	8%	16%	17%	10%

Table XXII. Influence of Market Conditions and Importance of Market View on FX Risk Management

Panel A. Does Your Home Country's Current Account Deficit or Government Budget Surplus/Deficit Affect the Amount and Timing of Your FX Hedging Strategy?

		All Respondents <i>n</i> = 454	Financial Firms <i>n</i> = 183	Nonfinancial Firms <i>n</i> = 263	North American Firms <i>n</i> = 151	Foreign Firms <i>n</i> = 287
Current Account	Yes	33%	42%	26%	24%	37%
	No	67%	58%	74%	76%	63%
Government Budget	Yes	31%	38%	24%	25%	33%
	No	69%	62%	76%	75%	67%

Panel B. How Important is Your Firm's Market View on Exchange Rates for Your FX Hedging Decisions?

Very Important or Important	45%	40%	50%	58%	39%
Somewhat Important or Not Important	55%	60%	50%	42%	61%

toward the OTC variety. Nearly 40% of firms use only OTC instruments, while another 23% use primarily OTC instruments. Only 12% indicated that they use only exchange-traded instruments. By subgroups, nonfinancial firms lean further toward OTC only (47%), but there is also a sizeable group (16%) committed to exchange-traded instruments only. Similarly, North American firms are slightly more dedicated to either extreme use of the OTC/exchange-traded spectrum than are foreign firms.

To learn about possible macro influences on firms' FX risk management decisions, we focus on the firm's home country's current account balance and central government budget balance. Panel A of Table XXII displays the responses for firms regarding how these macroeconomic variables affect their FX hedging decisions. For both measures, less than one-third of the firms indicate that these measures influence their FX hedging strategy. The rate of influence is slightly higher for financial firms and foreign firms. For North American firms, which are predominantly located in the United States where both of these measures have been in significant imbalance, only a quarter of the firms indicate that they have any influence on FX hedging behavior.

As to the influence of a market view on FX hedging, Panel B of Table XXII presents the responses. Only 45% of the responding firms indicate that their market view on exchange rates was "very important" or "important" to their FX hedging decisions with the complement indicating that it is only "somewhat important" or "not important." This result is a reversal

Table XXIII. Popularity of Various Methods Used for Operational Hedging of FX Risk

Popularity of Various Methods of Operational Hedging for FX Risk	All firms <i>n</i> = 332	Financial Firms <i>n</i> = 135	Nonfinancial Firms <i>n</i> = 190	North American Firms <i>n</i> = 115	Foreign Firms <i>n</i> = 232
b. Pricing strategies	55%	44%	62%	59%	53%
a. Foreign currency debt	45%	56%	39%	44%	47%
e. Product strategies	25%	34%	19%	21%	27%
c. Shifting production location	21%	14%	25%	32%	15%
f. Increase productivity	15%	6%	19%	13%	15%
g. Other	9%	9%	9%	9%	9%
d. Promotional strategies	8%	6%	8%	9%	7%

of the 60%/40% split in favor of a market view on IRs as being important to IR hedging decisions. There are also significant differences across the subgroups. Financial firms line up 60%/40% against their market view on exchange rates being important for their FX hedging strategy, while nonfinancials are equally split, 50%/50% on the issue. Geographically, 58% of North American firms indicate their market view as being “very important” or “important” for hedging decisions, while only 39% of foreign firms indicate the same. Interestingly, this last result contrasts with 64% of foreign firms indicating the importance of an IR view to their IR hedging decisions.

While derivatives and financial contracts are the most common method to manage FX risk, firms also use operational methods to manage FX risk. We ask firms to indicate usage of six common operational methods for dealing with FX risk, as well as the option to indicate some other method not listed. Table XXIII ranks these methods from the most to the least commonly used. Across all firms, the most common operational method for FX risk management is pricing strategies (55%) followed closely by foreign currency debt (45%). Product strategies (altering product mix) and shifting the location of production are in the middle of the list (25% and 21%, respectively) followed by increasing productivity and promotional strategies (altering promotional spending or targeting spending in certain locations) (15% and 8%). Nine percent of firms choose “other” and listed their methods, which include, most frequently, increasing geographic diversification and better matching of the currencies of revenues and costs.

In terms of subgroups, nonfinancial firms are more likely to use pricing strategies, consider shifting production location, and push increasing productivity as operational methods to deal with FX risk as compared to financial firms, who much prefer the use of foreign currency debt and altering product strategies. Geographically, differences in usage of operational methods are quite minor with the exception of a greater use of shifting production location by North American firms.

3. Credit Rate Risk Management

We determined earlier that CR risk was one of the most important risks faced by the firms responding to our survey. In this section, we ask some basic questions about the CR risk firms face and the instrument or methods they use to manage it. Again, by design, not all firms that face CR risk were directed to answer questions in this section. A total of 245 firms completed this section and answered at least part of one question.

Table XXIV. Forms of Credit Risk Faced

Percentage of Firms Facing Various Forms of Credit Risk	All Firms n = 231	Financial Firms n = 123	Nonfinancial Firms n = 108	North American Firms n = 99	Foreign Firms n = 132
a. Trade credits or accounts receivable from customers	67%	46%	91%	69%	65%
f. Corporate bonds in an investment portfolio	39%	66%	8%	36%	41%
b. Long-term contracts with customers	38%	43%	32%	27%	46%
e. Counterparties on financial derivatives	36%	54%	15%	31%	39%
c. Long-term contracts with suppliers	23%	13%	35%	27%	20%
g. Loan guarantees (cosigning)	22%	27%	16%	14%	27%
d. Loans to vendors	13%	17%	8%	8%	17%

The first question is to inform us about the forms of CR risk that these firms face. We offer a list of seven common forms of CR risk and ask the respondents to indicate whether they face each form of CR risk. Table XXIV provides the results. The most common form of CR risk is the standard risk on trade CRs or accounts receivables from customers. This form of CR risk is faced by 67% of the respondents. On the investment side, CR risk on corporate bonds in an investment portfolio is the next most commonly faced risk (39%) followed closely by long-term contracts with customers (38%) and counterparties on financial derivatives (36%). The remaining three forms of CR risk, long-term contracts with suppliers, loan guarantees, and loans to vendors, are cited by less than 25% of the respondents.

Not surprisingly, there are substantial differences in the results across financial and nonfinancial firms. Financial firms show more involvement with investment-based CR risks. Of the financial firms, 66% face CR risks from corporate bond investments and 54% on counterparties on financial derivatives. Of the nonfinancial firms, 91% face CR risks from trade CR and account receivables. Their other major sources are long-term contracts with suppliers (35%) and long-term contracts with customers (32%). Geographically, the differences are minor. Generally, foreign firms indicate that they face more forms of CR risk than North American firms. Of the foreign firms, 4% cite long-term contracts with customers as compared to only 27% of the North American firms. Also, 27% of the foreign firms indicate loan guarantees in contrast to only 14% of North American firms.

We follow-up with a question on the methods or contracts the firms use for managing these CR risks. Again, we offer seven choices of methods or financial contracts to manage CR risk. The results appear in Table XXV. It seems that standard operating methods dominated over financial contracts for managing CR risk. The most commonly chosen method (65% of respondents) is simply to impose a minimum CR rating for their counterparties. Also popular is imposing strict caps on exposure to any single counterparty (61%) and requiring the use of collateral (56%). The use of loan guarantees (cosigning of loans by another creditworthy party) is used by 29% of respondents and leads all of the financial contract option offers including CR default swaps, CR insurance, and total return swaps, each with less than 20% usage.

Table XXV. Methods for Managing Credit Risk

Percentage of Firms Using Each Method for Managing Credit Risk	All Firms n = 212	Financial Firms n = 120	Nonfinancial Firms n = 92	North American Firms n = 88	Foreign Firms n = 124
a. Minimum credit rating for counterparties	65%	75%	52%	57%	71%
b. Strict caps on exposure to any single party	61%	63%	59%	59%	63%
c. Collateral	56%	78%	27%	52%	59%
h. Loan guarantees (cosigning)	29%	38%	18%	28%	30%
f. Credit default swaps	18%	28%	4%	13%	22%
d. Credit insurance	17%	13%	24%	10%	23%
g. Total return swaps	9%	16%	1%	8%	10%

Within the subgroups, there are differences in the use of various methods. Financial firms are much more likely to impose minimum CR ratings (75% vs. 52%), require collateral (78% vs. 27%), and use CR default swaps (28% vs. 4%) and total return swaps (16% vs. 1%) than nonfinancial firms. However, nonfinancial firms are more likely to use CR insurance than financial firms (24% vs. 13%). Geographically, the differences are not so significant. Foreign firms appear to use a greater number of methods per firm than North American firms. In particular, the minimum CR rating and CR insurance are notably more popular with foreign firms than with North American firms.

4. Commodity and Energy Risk Management

Questions in this section were seen by a subset of firms that indicated that they managed CM or EN risk. We combined these two risks as the management of them is often handled in a similar way and in order to keep the survey from becoming too long for the respondents to answer fully. A total of 240 respondents answered at least one question in this section.

Our main question for CM and EN risk management is to ascertain the contracts and other methods firms use to manage these risks. In Table XXVI, we display the results of the question asking firms to indicate their use of eight different instruments and methods for managing CM and EN risks. For all respondents, forward contracts are the most commonly used method with 39% of firms indicating use. The next most used methods for CM and EN risk management are futures contracts (34%) and fixed pricing contracts (34%). Less commonly used methods are swaps (17%), OTC options (13%), and option combinations (e.g., collars caps) (12%). The least commonly used methods are exchange-traded options (9%) and debt contracts with embedded (CM or EN) options (2%). When each firm is asked to vote for the most used method, the rankings come out relatively the same. Forwards are the most important method for 61% of the firms that use forwards. Fixed price contracts are considered the most important method by 57% of the firms that use this method, while futures contracts are rated as most important by 54% of their users. Interestingly, even the less commonly used methods are rated as most important by roughly 25% of their users suggesting that firms have a wide variety of favorite methods for managing these risks.

Given the small number of financial firms that answered questions in this section (28), it does not make sense to compare financial and nonfinancial firms. Thus, in Table XXVI, we look

Table XXVI. Methods Used for Managing Commodity and Energy Risks

Commodity and Energy Contracts/Positions	All Respondents <i>n</i> = 193		North American <i>n</i> = 105		Foreign <i>n</i> = 84	
	Use	Ranked Most Used	Use	Ranked Most Used	Use	Ranked Most Used
a. Forward contracts	39%	61%	33%	63%	46%	59%
b. Futures contracts	34%	54%	33%	51%	33%	57%
c. Fixed pricing contracts	34%	57%	38%	50%	27%	65%
h. Swaps	17%	28%	17%	22%	17%	36%
d. OTC options	13%	31%	11%	25%	15%	38%
f. Option combinations (e.g., caps, collars)	12%	25%	16%	18%	7%	50%
e. Exchange-traded option contracts	9%	18%	10%	0%	8%	29%
g. Debt contracts with embedded options	2%	25%	2%	50%	2%	0%

Table XXVII. Mix of Over-the-Counter and Exchange-Traded Commodity and Energy Derivative Instruments

Mix	All Firms <i>n</i> = 150	North American <i>n</i> = 72	Foreign <i>n</i> = 74
Over-the-counter only	41%	38%	45%
Mostly OTC	19%	18%	18%
Equal mix	17%	19%	15%
Mostly exchange-traded	10%	13%	8%
Exchange-traded only	14%	13%	15%

only at the geographic breakdown of North American versus foreign firms. As noted previously, there are no major differences between the results of North American and foreign firms. North American firms have a greater propensity to use fixed pricing contracts and option combinations, while foreign firms have a greater propensity to use forward contracts. In terms of most favored methods, the same three methods fill the top ranked slots, though the order of the top three is reversed between the two subgroups.

As with the other risk areas, we ask about the mix between OTC instruments and exchange-traded instruments. These results are displayed in Table XXVII. As with the FX derivatives, a majority of firms primarily use OTC instruments. Forty-one percent of the responding firms indicate that they only use OTC derivative instruments, while 14% indicate they only use exchange-traded instruments. Geographically, although they are also majority OTC, North American firms lean slightly toward exchange-traded instruments when compared to foreign firms.

Finally, we ask about the level of discretion allowed in the firms' CM and EN hedging approach. Firms are asked to categorize their CM and/or EN risk management policy as either discretionary, nondiscretionary, or some combination of discretion and rules referred to as a variable policy in the survey. The results of this question are provided in Table XXVIII. Of the firms responding, 31% indicate that their risk management approach for CM and EN risks

Table XXVIII. Level of Discretion in CM and EN Risk Management Approach

CM and EN Risk Management Approach is ...	All Firms n = 182	North American n = 92	Foreign n = 84
Discretionary	31%	26%	37%
Variable	25%	22%	30%
Nondiscretionary	37%	46%	27%
Other	7%	7%	6%

is discretionary, while 37% indicate that their approach is nondiscretionary. A variable policy best describes the approach for 25% of the firms, while another 7% indicated some other approach.

These results demonstrate some interesting differences when we break them down geographically. North American firms are less likely to have a discretionary policy than foreign firms (26% to 37%). Nearly 46% of the North American firms indicate that their approach is nondiscretionary compared to just 27% of foreign firms.

5. Geopolitical Risk Management

The final area-specific set of questions involves GP risk. Once again, to reduce survey fatigue, not all of the firms that indicated they faced GP risk were directed to this section. In all, 236 firms were directed to and answered at least one question in this section.

GP risk management has not generally been studied in past surveys of corporate risk management. Thus, to obtain some idea as to how firms make GP risk management decisions, we begin by asking about the circumstances in which firms consider GP risk. We chose to focus the question around investment size and location. The first question asks whether the firm evaluates GP risk for investments over a certain minimum size, and a second question asks whether firms evaluate GP risk for investments in select foreign countries, all foreign, countries, and/or home. The responses of these questions are provided in Table XXIX.

With respect to investment size, Panel A of Table XXIX indicates that a majority of firms (58%) evaluate political risk only for investments over some minimum size. This result is consistent across subgroups with the exception of North American firms where it is slightly more common for these firms to evaluate GP risk for investments of any size. As for the location of the investment, Panel B of Table XXIX indicates that the most common response is for firms to evaluate GP risk only for investments in select foreign countries (43%). This is followed by the other extreme response whereby 25% of firms evaluate investments for GP risk in all foreign countries, as well as in the home market. The choices of all foreign countries and select foreign countries and home are chosen by just 16% of the respondents. Interestingly, if we cross-tabulate these questions, 52 firms (24%) evaluate GP risk only for investments over a certain size and in select foreign countries, while only 25 respondents (13%) evaluate GP risk for investments of any size and in all markets.

By subgroups, financial firms are more likely to use less discretion with 20% indicating all foreign countries and 27% all locations including the home country. Nonfinancial firms are much more apt to use discretion with 52% indicating evaluation for only select foreign countries. North American firms show the least discretion with 20% and 29% in the all foreign countries and all foreign plus the home country categories, respectively.

Table XXIX. Geopolitical Risk Assessment

<i>Panel A. For What Size Investments Does Your Firm Evaluate Geopolitical Risks?</i>					
Investment Size	All Respondents n = 191	Financial Firms n = 81	Nonfinancial Firms n = 109	N. American Firms n = 83	Foreign Firms n = 107
Any size	42%	36%	47%	53%	34%
Over a certain size	58%	64%	53%	47%	66%

<i>Panel B. For Investments in What Locations Does Your Firm Evaluate Geopolitical Risks?</i>					
Investment Size	All Respondents n = 169	Financial Firms n = 71	Nonfinancial Firms n = 95	N. American Firms n = 66	Foreign Firms n = 100
Select foreign countries	43%	34%	52%	37%	49%
All foreign countries	16%	20%	13%	20%	13%
Select foreign countries and home country	16%	19%	14%	13%	18%
All foreign countries and home country	25%	27%	21%	29%	20%

To examine the methods firms use to manage GP risk, we offer a broad list of methods of dealing with GP risk and ask firms to indicate whether they use any of these. Panel A of Table XXX presents the responses. The most commonly used method to manage GP risk is simply to avoid investments in certain countries. This is chosen by 50% of the respondents (Giambona, Graham, and Harvey, 2017). There are two standard operating approaches to reducing risk. At least 40% of firms either increase research before engaging in new investments or diversify investments across more countries. Other approaches include lowering the company profile in the risky country and increasing the hurdle rate on projects in the risky country, both used by 26% of the respondents. The remaining seven suggested methods are used by 19% to 15% of the respondents. These include the increased use of currency or CM hedging, increasing the use of political risk analysts, increasing the use of security personnel, alerting supply chain management, diversifying investments across more industries, the use of political risk insurance, and enhancing public relations in the risky region. That all 14 methods had at least 15% of the firms indicate some usage suggests that firms use multiple approaches to deal with GP risk.

In terms of the subgroups, financial firms are much more likely than nonfinancial firms to manage GP risks by diversification of their investments either across countries (59% vs. 25%) or industries (27% vs. 8%), as well as make increased use of political risk analysts (26% vs. 12%). On the flip side, nonfinancial firms are much more likely than financial firms to manage GP risks by increasing the use of partners or consortia (44% vs. 25%), increase the use of security personnel (23% vs. 7%), and altering their supply chain management (27% vs. 1%). Geographically, the difference in usage rates across the two regions is not substantial. North American firms are more likely than foreign firms to make increased use of partners or consortia (41% vs. 31%), increase their use of security personnel (22% vs. 11%), and alter supply chain management (24% vs. 9%). Foreign firms are more likely than North American firms to make greater use of diversification of investments across countries (45% vs. 32%) and political risk insurance (20% vs. 10%).

Table XXX. Use of Various Methods to Deal with Geopolitical Risk

Panel A.

Use of Various Methods to Deal with Geopolitical Risk (as a Percentage of All Respondents)	All <i>n</i> = 210	Financial <i>n</i> = 88	Nonfinancial <i>n</i> = 119	North American <i>n</i> = 90	Foreign <i>n</i> = 117
1. Avoid investments in certain countries	50%	45%	52%	52%	47%
2. Increase research before new investment	44%	47%	42%	42%	45%
3. Diversify investments across more countries	40%	59%	25%	32%	45%
4. Decrease size of investments in risky countries	36%	39%	34%	31%	39%
5. Increase use of partners or consortia	36%	25%	44%	42%	31%
6. Lower company profile in risky region	26%	22%	30%	26%	27%
7. Increase hurdle rate on projects in risky regions	26%	24%	27%	28%	24%
8. Increase use of currency/commodity hedging	19%	18%	19%	22%	16%
9. Increase use of political risk analysts	18%	26%	12%	16%	20%
10. Increase use of security personnel	16%	7%	23%	22%	11%
11. Alter supply chain management	16%	1%	27%	24%	9%
12. Diversify investments over more industries	16%	27%	8%	13%	18%
13. Political risk insurance	15%	13%	18%	10%	20%
14. Enhance public relations in risky region	15%	14%	16%	16%	15%

(Continued)

Table XXX. Use of Various Methods to Deal with Geopolitical Risk (Continued)

Panel B.

Ranked as #1 Most Commonly Used Method for Dealing with Geopolitical Risk (as a Percentage of Users of That Method Above)	All	Financial	Nonfinancial	North American	Foreign
1. Political risk insurance	66%	64%	67%	67%	65%
2. Avoid investments in certain countries	47%	50%	45%	47%	47%
3. Increase use of currency/commodity hedging	33%	50%	22%	10%	58%
4. Decrease size of investments in risky countries	31%	29%	33%	21%	37%
5. Alter supply chain management	27%	100%	22%	32%	18%
6. Diversify investments over more industries	24%	17%	44%	33%	19%
7. Increase use of partners or consortia	24%	14%	27%	24%	22%
8. Diversify investments across more countries	24%	27%	20%	24%	25%
9. Increase research before new investment	20%	22%	18%	24%	17%
10. Increase use of political risk analysts	19%	17%	21%	29%	13%
11. Lower company profile in risky region	18%	16%	19%	22%	16%
12. Enhance public relations in risky region	16%	17%	16%	21%	12%
13. Increase hurdle rate on projects in risky regions	9%	10%	9%	16%	4%
14. Increase use of security personnel	6%	17%	4%	10%	0%

Table XXXI. When Valuing Investment Projects with Significant Political Risk, How Does Your Firm Incorporate the Political Risk into the Decision?

Method of Incorporating Risk into Valuation (May Be Multiple Choices)	All Firms n = 206	Financial Firms n = 89	Nonfinancial Firms n = 114	N. American Firms n = 85	Foreign Firms n = 118
a. Add a risk premium to the required rate of return	57%	58%	57%	53%	61%
b. Use risk-adjusted expected cash flows	28%	33%	24%	26%	29%
c. Scenario/Simulation analysis	36%	47%	26%	33%	37%
d. Price in political risk insurance costs	15%	18%	13%	9%	19%

Panel B of Table XXX provides the ranking of the methods based upon the percentage of users that voted each method as their most commonly used technique for managing GP risk. Thus, these percentages express the relative popularity of a method. Absolute popularity requires multiplying these percentages with the percentages in Panel A. Given this measurement technique, political risk insurance, although used by only 15% of firms, ranks as the most important method by 66% of these users. The simple approach of avoiding investment in risky countries is the most popular choice for 47% of its users, while its corollary of just decreasing the size of the investment in risky countries is most popular with 31% of its users. The only other method to be voted most popular choice by more than 30% of its users, increased currency/CM hedging, ranks most important at 33%. If we were to report the popularity figures in terms of overall votes rather than as a percentage of firms using each method, the top three methods are: avoiding investments in certain countries (23% of all respondents), decrease the size of investments in risky countries (11%), and political risk insurance (10%).

Broken down into subgroups, the differences in the most popular method are relatively minor. Political risk insurance relatively remains the most popular method employed by its users with 64% plus of its users in each subgroup indicating it as their most popular method. The only choice that is notably more popular with financial firms than the general population is increased currency/CM hedging, while for nonfinancial firms, it is diversifying across more industries.¹³ Geographically, North American firms are more likely to rank increased use of political risk analysts as their top choice than the general population, while foreign firms are much fonder of increased currency/CM hedging.

One difficulty with GP risk is that there is not a general consensus concerning how to take it into account when undertaking the valuation of projects facing this risk. To gain insight into methods firms use, we ask them to indicate the usage of various methods of incorporating GP risk into a valuation decision for an investment. We offer four possible methods: 1) adding a risk premium to the required rate of return, 2) using risk-adjusted expected cash flows, 3) using scenario/simulation analysis, and 4) pricing in political risk insurance costs. The responses to this question appear in Table XXXI. For all respondents, 57% use the simple approach of adding a risk premium to the required rate of return. The second most used method is scenario/simulation

¹³ The financial firms sample displays a 100% result for alter supply chain management in Panel B of Table XXX. This is because only one financial firm indicated use of this method and they ranked it as their most commonly used method. Thus, its popularity in this case is idiosyncratic to this one particular firm.

analysis selected by 36% of the firms. Risk-adjusted expected cash flows is selected by 28% of the firms, while only 15% select pricing in political risk insurance. This low number for political risk insurance could be because only 15% of the firms indicated that they use political risk insurance. However, pricing in the costs to account for the risk in valuation does not require that the firm actually use political risk insurance.¹⁴

The responses to this question are relatively the same across the subgroups. Financial firms are more likely to use multiple methods and employ scenario/simulation analysis proportionally more often than nonfinancials. Geographically, the foreign firms tend to be more likely to price in political risk insurance than North American firms.

Finally, we end the section with a question about political risk insurance. We simply ask whether firms hold any political risk insurance contracts. For the respondents to this question, 18% indicate that they held at least one such contract. Conditionally, the positive response rate varied only slightly. For financial firms, it was 18%, while for nonfinancial firms it was 15%. For North American firms, it was 13% and for foreign firms it was 19%.

V. Conclusions

The results of this survey provide a broad understanding of the current state of corporate risk management around the world. In our analysis, we find evidence consistent with some of the traditional risk management theories, but not with all. However, our survey results allow us to go beyond traditional motives for hedging. For nonfinancial firms, the single most important reason to hedge is to increase expected cash flows (nearly 90% of the firms). A large majority of firms tell us that they also hedge to smooth earnings or to satisfy shareholders expectations. We believe that theoretical work could benefit from directly incorporating these new channels into risk management models.

We also find that market conditions, accounting rules, and stricter regulations (e.g., Dodd-Frank Act of 2010) could discourage firms from hedging. For instance, 30% of the firms indicate that they would reduce hedging if OTC derivatives are restricted in favor of exchange-traded contracts. Relatedly, the majority of firms say that they would decrease derivatives usage if they are required to post collateral or post more collateral on OTC contracts.

We hope these findings will help inform the policy debate on derivatives regulations. Our results suggest that adopting stricter regulations to promote market stability could discourage corporate hedging. Regulators must balance the necessity to stabilize the market with the effect that stricter regulation could have on corporate risk management. We also hope that our findings will stimulate research regarding how market conditions and regulatory changes can affect corporate hedging.

Exposure to the six areas of risk we study in this survey including IR, FX, CM, EN, CR, and GP, is quite prevalent, especially for IR, CR risk, and FX risk. The vast majority of firms that face material risk in these areas are managing this risk in some form, more so with operational hedges than with financial hedges. These findings suggest that future empirical research could benefit from an increased availability of operational risk management data.

For specific forms of financial risk, such as IR, FX, and CM, firms generally use a mix of financial and operational methods to manage their risk. If they use financial derivatives, they tend to favor OTC instruments over exchange-traded ones. In choosing among financial instruments,

¹⁴ This conclusion is supported by comparing the subgroup analysis where pricing in political risk premiums is selected by 18% of financial firms, while in Table X, Panel A, we find that only 13% of financial firms actually use political risk insurance.

firms overwhelmingly prefer basic instruments with forward contracts generally as the most popular derivative instrument. Interestingly, the popularity of options and option combinations appears to have decreased relative to the evidence in some earlier surveys.

Appendix: Previous Surveys

Authors	Year	Country	Focus of the study / tools of risk management
Block and Gallagher	1986	United States	Interest rate risk management.
Dolde	1993	United States	Exchange and interest rate risk management tools.
Bodnar, Hayt, Marston, and Smithson	1995	United States	Study about derivatives use to define the evolution of derivatives usage in the time.
Bodnar, Hayt, and Marston	1996	United States	Study about derivatives use to define the evolution of derivatives usage in the time.
Berkman and Bradbury	1996	New Zealand	Study about derivatives use.
Hakkarainen, Kasanen, and Puttonen	1997	Finland	Study about interest rate risk management tools. Particularly, comparison with other countries.
Berkman, Bradbury, and Magan	1997	New Zealand	Study about derivatives use and comparison with American studies.
Bodnar, Hayt, and Marston	1998	United States	Study about derivatives use to define the evolution of derivatives usage in the time.
Alkebäck and Hagelin	1999	Sweden	Study about derivatives use and comparison with US and New Zealand study.
Bodnar and Gebhardt	1999	Germany	Study about derivatives use in risk management activity.
Jalilvand	1999	Canada	Study about derivatives use and comparison with US and New Zealand study.
Fatemi and Glaum	2000	Germany	Study about risk managers' activity. Particularly, financial and nonfinancial risk management.
Mallin, Ow-Yong, and Reynolds	2001	United Kingdom	Study about derivatives use and comparison with Bodnar et al. (1995).
Bodnar, de Jong, and Macrae	2003	Netherlands	Study about derivatives use conditioned by institutional rule, comparison with Bodnar et al. (1998).
El-Masry	2006	United Kingdom	Study about derivatives use in risk management.
Servaes, Tamayo, and Tufano	2009	Global	Study about risk management activity as from a global corporate survey of corporate activities.

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