

Corporate risk management practices and firm value in an emerging market: a mixed methods approach

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Abstract This paper examines the impact of corporate risk management strategies, namely, (1) financial, (2) operational, and (3) enterprise risk management on firm value in the context of an emerging market, Turkey. We use a unique hand-collected sample of non-financial Turkish companies for the years 2010–2015 and use mixed research methods to gain insights into the complex relationship between risk management and firm value. The quantitative methodology is accompanied by a follow up qualitative study that involves in-depth interviews with selected finance and risk management professionals. Results surprisingly reveal that none of the three risk management strategies increase firm value. We explore how the different institutional circumstances surrounding firms moderate the relationship between risk management and firm value and derive some policy implications for authorities in emerging markets regarding improving disclosures on risk management and corporate governance.

Keywords Corporate risk management · Financial hedging · Operational hedging · Enterprise risk management · Firm value

Introduction

Corporate risk management and its firm valuation effects have received significant interest in the finance literature as a growing body of research acknowledges that firms conduct a range of risk management activities such as (1) financial, (2)

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operational, and (3) enterprise risk management (ERM) with potentially positive effects on firm value (Allayannis and Weston 2001; Sang Kim et al. 2006; Hoyt and Liebenberg 2011). These findings have been attributed to the relevance of many market frictions (e.g., financial distress and bankruptcy costs, taxes, costly external financing, agency costs, and asymmetric information), which may make the hedging activities necessary and beneficial for firm survival and success.

This paper contributes to the literature on the valuation effects of hedging by investigating the specific context of Turkey, an emerging market where corporate risk management practices are relatively new compared to developed markets. During the analysis period (2010–2015), Turkish economic growth accelerated with an average annual rate of 5.22% and the share of foreign trade in GDP soared to 57% (World Bank 2017). The increase in international trade was accompanied by high fluctuations in exchange rates,¹ creating an increased need for hedging and potentially increasing the benefits of hedging for shareholders. Yet, Turkey's institutional environment, as other emerging markets, is significantly different from the developed markets; posing uncertainty on the extent one should expect positive valuation effects for the corporate hedging activities of Turkish firms.

Corporate hedging benefits firm value by moderating the firm's cash flow volatility, reducing the costs of financial distress, increasing the debt capacity, and the associated tax advantages as well as reducing tax payments and boosting investment capacity of the firm (Froot et al. 1993; Mayers and Smith 1982; Smith and Stulz 1985; Ross 1998). At the same time, theories of managerial risk aversion point to the possibility that hedging is not always implemented with the motives of shareholder value maximization, but instead implemented due to the personal tendencies of managers to reduce their risk exposures (Stulz 1984; Smith and Stulz 1985). The majority of the empirical studies are on developed economies and they generally find positive value premiums for hedgers (Allayannis and Weston 2001; Sang Kim et al. 2006; Hoyt and Liebenberg 2011). On the other hand, there is a very limited amount of evidence from emerging markets which present either positive or insignificant value premiums for different hedging strategies (Tahir and Razali 2011; Búa et al. 2015; Ayturk et al. 2016). The complex motives in different institutional settings underlying the hedging decisions arguably lead to different market value outcomes and contribute to the mixed findings in the literature. While the motivations for hedging in developed markets provided in the literature such as moderating the firm's cash flow volatility, reducing the costs of financial distress, increasing the debt capacity, and the associated tax advantages, also hold for emerging markets like Turkey; other motivations, however, are found to be more prevalent which generate the basis to expect insignificant value premiums for risk management practices. For example, Turkey is characterized by high ownership concentration (Yurtoglu 2000) and as outlined in the theories of managerial risk aversion, risk-averse owner-managers are more likely to use hedging tools to protect their own interests without necessarily benefiting the shareholders (Allayannis et al. 2012). As Turkish publicly held firms are under no obligation to submit separate reports of their hedging

¹ Turkish lira lost 80% in value against USD between the years 2010 and 2015 (World Bank 2017).

practices to financial authorities, information asymmetries remain high even if firms hedge heavily which hinders the ability of corporate hedging to boost market value. The less stringent corporate governance regulations in emerging markets, which encourages speculation and protecting personal benefits when using risk management tools, could also affect the relationship between risk management practices and firm value and these factors lead us to expect less or insignificant value premiums for hedging practices in emerging markets like Turkey (Lel 2012; Claessens and Yurtoglu 2013). Hence, further research into the complex relationship between corporate hedging and firm value is warranted with particular emphasis on understanding how different motives of hedging in emerging markets affect the valuation outcomes. This motivates us to explore the valuation effects of corporate hedging in an emerging market, Turkey, which is characterized by weaker corporate governance, a high degree of informational asymmetries, higher ownership concentration, and weaker investor protection (Yurtoglu 2000; Allayannis et al. 2012; Lel 2012; Claessens and Yurtoglu 2013). Moreover, the paper becomes the first in the literature to jointly consider the three different risk management activities and to examine their effects by combining quantitative and qualitative techniques in a mixed method approach and, thereby contributing deeper insights than what would be possible with the sole use of quantitative techniques.

In this paper, besides examining the impact of financial and operational hedging practices; and ERM on Turkish firms' value using a unique hand-collected dataset between 2010 and 2015; we present information on the motivations for corporate risk management in this emerging market context using a unique methodology: mixed methods approach through combining quantitative and qualitative techniques. The results reveal that none of these three risk management strategies increase firm value in the Turkish context, and qualitative in-depth interviews point to the presence of reasons for the lack of a significant effect. The paper argues that the lack of a close relationship between risk management and firm value results due to (1) low regulatory stringency around disclosure of risk management practices and weaker corporate governance, leading to high levels of information asymmetry in the markets; (2) low level of support for risk management from top management which also results from weak corporate governance mechanisms; (3) managerial risk aversion motives instead of value maximization arguments; (4) the ambiguity around the concept of risk management and the unclear job descriptions; and (5) deliberate and indeliberate misuse of financial hedging instruments. The paper is structured in five sections. Section 2 summarizes the relevant literature, followed by Sect. 3 that describes the data and methodology used in the paper. Section 4 presents the findings; Sect. 5 includes robustness tests; and Sect. 6 concludes with managerial and policy implications.

Review of the literature

The theoretical underpinnings of how corporate hedging activities affect firm value rest on two important strands of literature: The first is the *shareholder value maximization* literature and the second is the *managerial risk aversion* literature. The



shareholder maximization argument claims that the objective of corporate hedging is to benefit shareholders by reducing the exposure of a firm's cash flow to an underlying risk. The explanations behind this argument suggest that hedging helps to reduce the expected costs of financial distress, provide tax incentives, and mitigate the underinvestment problems. First, hedging can create value by decreasing financial distress costs (Mayers and Smith 1982; Smith and Stulz 1985). Second, Smith and Stulz (1985) state that a decrease in the volatility of taxable income would lower expected taxes for firms with convex effective tax functions and create value. Furthermore, by increasing a firm's debt capacity, hedging can generate greater tax benefits (Leland 1998). Finally, when external financing is more costly, hedging can lower the probability that a firm needs external financing and ensures that there is enough cash flow to internally finance attractive investments and help to protect the optimal investment programs (Froot et al. 1993). On the other hand, *managerial risk aversion* theories claim that hedging originates from managers' tendencies to reduce their risk exposure in order to shield themselves from financially undesirable situations even though this may not necessarily benefit shareholders. Managers, being risk-averse individuals, conduct hedging activities to reduce firm risk if a significant part of their wealth is concentrated in the firm they manage and when they do not hold well-diversified portfolios of their own (Stulz 1984; Smith and Stulz 1985). DeMarzo and Duffie (1995) and Dadalt et al. (2002) argue that financial hedging and its proper disclosure improves the availability of information on corporate earnings through providing a signal of management ability and, reduces asymmetric information between managers and outsiders. Finally, firms may also use derivatives to speculate with the intention to make a profit and this increases firm risk rather than mitigating it and not benefiting investors (Geczy et al. 2007).

The rest of this section examines the empirical corporate hedging literature with particular attention to the three hedging strategies covered in this paper: (1) Financial Hedging, (2) Operational Hedging, and (3) Enterprise Risk Management. Additionally, a final section on the corporate hedging activities in Turkey is provided to equip the reader with further information about the empirical context this paper focuses on.

Financial hedging

Financial hedging involves managing the risk of loss arising from the unexpected changes in the market prices of currency exchange rates, interest rates, commodity prices, or equity prices and is conducted mainly through financial derivatives. The empirical literature on the valuation effects of corporate risk management dominantly tests the effects of financial hedging on firm value. As displayed in Table 1, which presents a range of highly cited empirical studies in the literature and provides details on datasets used in these studies, most studies are conducted in developed markets and the evidence on the impact of financial hedging on firm value is mixed.

The seminal work of Allayannis and Weston (2001) finds that the use of foreign currency derivatives (FCD) in the US results in an increase in firm value and more

Table 1 Literature review

Study	Fin. hedging	Oper. hedging	ERM	Dataset	Performance indicators	Findings
Panel A: developed countries Allayannis and Weston (2001)	+			720 US non-financial firms from 1990 to 1995	Tobin's Q	The use of FCDs results in a hedging premium of 5% of the firm value for firms with positive foreign sales
Allayannis et al. (2001)		0		265 US multinational non-financial firms during 1996–1998	Market-to-book ratio	Operational hedging strategies have no significant impact on firm value and benefit shareholders only when used in combination with financial hedging strategies
Pramborg (2004)	+			Swedish non-financial firms from 1997–2001	Tobin's Q	The use of FCDs increases firm value
Carter et al. (2006)	+			28 US airline companies from 1992–2003	Tobin's Q	They find that jet fuel hedging is positively related to airline firm value with a value premium of 5–0%
Sang Kim et al. (2006)	+	+		424 non-financial US firm observations from 1996 to 2000	Tobin's Q	The use of FCDs and operational hedging both have a positive effect on firm value and these hedging strategies are complementary
Jin and Jorion (2006)	0			119 US oil and gas producers from 1998 to 2001	Tobin's Q	Financial hedging with commodity derivatives has no significant effect on firm value
Mackay and Moeller (2007)	+			34 US oil refiners from 1985 to 2004	Tobin's Q	Hedging concave revenues and leaving concave costs exposed each represents between 2 and 3% of firm value



Table 1 (continued)

Study	Fin. hedging	Oper. hedging	ERM	Dataset	Performance indicators	Findings
Gordon et al. (2009)			+	112 US firms for the year 2005	Excess stock market returns	The positive relation is contingent upon the match between ERM and environmental uncertainty, industry competition, firm size, firm complexity, and board of directors' monitoring
Magee (2009)	0			408 large US non-financial firms with foreign sales from 1996 to 2000	Tobin's Q	Controlling for endogeneity, hedging with FCDs has no effect on firm value
Hoyt and Liebenberg (2011)			+	117 US insurance firms from 1998 to 2005	Tobin's Q	Insurers engaged in ERM are valued approximately 20% higher than other insurers
McShane et al. (2011)	+	+	0	82 US insurance companies for the year 2008	Tobin's Q	Evidence of a positive relationship between traditional risk management and firm value but no additional increase in value for firms achieving a higher ERM rating
Panaretou (2013)	+	0		FTSE 350 non-financial firms from the UK for the period 2003–2010	Tobin's Q	The use of FCDs results in a hedging premium of 6% of the firm value. Operational hedging does not have a significant impact
Belghitar et al. (2013)	0			211 French non-financial firms for the years 2002–2005	Tobin's Q	The use of FCDs does not have a significant impact on firm value

Table 1 (continued)

Study	Fin. hedging	Oper. hedging	ERM	Dataset	Performance indicators	Findings
Perez-Gonzalez and Yun (2013)	+			203 US electric and gas utility firms between 1960 and 2007	Tobin's Q	Financial hedging with weather derivatives has a significant positive impact on firm value
Panel B: emerging countries						
Berrospside (2008)	+			350 Brazilian non-financial firms from 1997 to 2005	Tobin's Q	Firms using derivative instruments have around 10–12% higher value compared to those that do not
Ameer (2009)	+			427 Malaysian non-financial firms from 2003 to 2007	Share price	The use of FCDs has a positive impact on share prices
Tahir and Razali (2011)			0	528 listed Malaysian firms in 2007	Tobin's Q	ERM is significantly not related to firm value
Gomez-Gonzalez et al. (2012)	+			81 Colombian non-financial firms from 1995 to 2008	Tobin's Q	A hedging premium of 1.8–2% of the firm value
Búa et al. (2015)	+	0		100 Spanish non-financial companies from 2004–2007.	Tobin's Q	Hedging with financial derivatives leads to an average premium of 1.53%, while operational hedging has no effect on company value
Ayturk et al. (2016)	0			204 Turkish non-financial firms from 2007 to 2013	Tobin's Q and Stock price return	Overall, their results imply that the use of financial derivatives does not have a significant impact on firm value
Panel C: cross-country studies						
Bartram et al. (2011)	+	or none		6888 non-financial firms in 47 countries from 2000 to 2001	Tobin's Q	The evidence is positive but not always significant, being sensitive to endogeneity and omitted variable concerns



Table 1 (continued)

Study	Fin. hedging	Oper. hedging	ERM	Dataset	Performance indicators	Findings
Allayannis et al. (2012)	+ or none			A sample of 372 cross-listed foreign firms on a major US exchange from 39 countries for the years 1990–1999	Tobin's Q	The effect of currency derivatives use on firm value is significantly positive only for firms that have strong corporate governance

This table presents a range of highly cited empirical studies on the valuation effects of corporate risk management. While Panel A and B display the studies on developed and emerging countries, respectively; Panel C presents the cross-country studies

recent studies confirm this finding (Carter et al. 2006; Mackay and Moeller 2007; Perez-Gonzalez and Yun 2013). On the other hand, a significant portion of the literature brings the value of financial hedging into question. Guay and Kothari (2003) find no significant effect of financial hedging on firm value in the US and suggest that the positive value premium finding in Allayannis and Weston (2001) and other studies could be spurious as the increase in firm value is affected by other risk management activities such as operational hedging. Later, Jin and Jorion (2006), Magee (2009), and Belghitar (2013) confirm Guay and Kothari's (2003) findings in developed market settings once the endogeneity problem is controlled for. As Table 1 Panel B demonstrates, evidence from emerging markets is limited to a handful of studies due to lack of data availability. While Berrospide (2008) and Ameer (2009) find that the use of financial risk management has a positive impact on firm value in Brazil and Malaysia, respectively, they, however, do not consider the endogeneity problem. Among studies that control for endogeneity, Gomez-Gonzalez et al. (2012) find that currency hedging has a positive impact on firms' value in Colombia, while Ayturk et al. (2016) find that the use of financial derivatives does not affect firm value in Turkey. Cross-country evidence (see Table 1 Panel C) is also limited due to lack of available data on corporate risk management. Bartram et al. (2011) use a large sample of non-financial firms from 47 countries between 2000 and 2001 and find weak evidence that market value for derivative users is higher. Allayannis et al. (2012) and Leil (2012) confirm Bartram et al.'s (2011) findings and show that the impact of financial hedging is conditional on the presence of strong firm-level or country-level corporate governance contexts and weakly governed firms use derivatives for reasons consistent with managerial utility-maximization hedging theories and selective hedging.

Operational hedging

Studies discussed in Sect. 2.1 proxy corporate risk management only by financial risk management practices, which is challenged by a more recent stream of literature stating that firms typically use a whole range of coordinated risk management instruments (Pantzalis et al. 2001; Guay and Kothari 2003; Aretz and Bartram 2010). Multinational companies often sell their products in various countries, increasing exchange rate risk exposures on different currencies. Operational hedging through locating operations in different countries where the company expects significant sales revenues is, then, used in addition to financial hedging to better mitigate currency risks (Chowdhry and Howe; 1999; Sang Kim et al. 2006). Studies that consider both financial and operational hedging are limited in number and mostly point to non-significant value effects of operational hedging on its own. Allayannis et al. (2001) find that even though the use of operational hedging strategies alone does not lead to an increase in firm value in the US, it benefits shareholders when used in combination with financial hedging strategies. Sang Kim et al. (2006) show that operational and financial hedging strategies are often jointly used as complementary techniques and increase firm value. Pramborg (2004) concludes that foreign currency derivatives and geographical diversification increase firm value in the context

of Sweden. Búa et al. (2015) and Panaretou (2013) find that hedging with foreign currency derivatives boost firm value while operational hedging does not have a significant impact in Spain and UK, respectively.

Enterprise risk management

There is a burgeoning literature surrounding the practice of enterprise risk management (ERM) that seeks to implement a more holistic and less siloed approach to risk management. The recent financial crisis of 2007–2009 has intensified interest in ERM as a critical component of overall health and long-term sustainability of the firms (Fox 2009). ERM is a management process that enables firms to manage a wide array of different types of risk in a top-down and enterprise-wide fashion. The Committee of Sponsoring Organizations of the Treadway Commission (COSO) in its ERM frameworks developed in 2004 and updated in 2017 (COSO 2004, 2017), defines ERM as:

Enterprise risk management is a process, effected by an entity's board of directors, management and other personnel, applied in a strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.

The ERM process starts with identifying all of the risks the firm is facing and then assessing the consequences of these risks jointly by accounting for their interactions. ERM differs from traditional risk management in that it attempts to manage all risks a firm is facing, including operational, strategic, and reputational risks (Pagach and Warr 2011). Whereas traditional risk management deals with pure risks² and financial risks, ERM captures the functions of traditional risk management and additionally focuses on further risks such as operational or strategic risks in a holistic top-down approach (McShane et al. 2011). ERM aggregates all potential risks a firm faces and considers the interdependencies between them. Therefore, it achieves a more comprehensive and precise risk assessment mechanism which nicely integrates into overall business strategy (Gatzert and Martin 2015). ERM can increase firm value through the same channels proposed in the prior theoretical literature. However, the costs associated with the adoption of ERM systems (e.g., necessary financial and human resources, as well as the required IT systems) should be accounted for when assessing the valuation benefits of ERM (McShane et al. 2011). In addition, the implementation of ERM is only likely to succeed in the presence of a strong risk culture in the firm and when the adequate compensation systems are established (Rochette 2009). Recently, ERM has led to some actual and proposed regulatory changes and improvements in the regulatory processes in many countries which show its growing global convergence (Wilkinson 2011).

² Pure risks are hazard risks which are insurable and there is no possibility of gain. Examples include property and liability risks.

Even though growing numbers of firms have started implementing ERM in the recent years, there is limited empirical evidence regarding the impact of such programs on firm value and these findings are mixed. Hoyt and Liebenberg (2011) who investigate the value implications of ERM programs on US insurance companies, find a significant premium of roughly 20%. Beasley et al. (2008) investigate equity market reactions of ERM implementation in the US and find that the benefits of ERM are highly contingent on firm-specific characteristics. Gordon et al. (2009) find that the performance outcomes of ERM in the US depend on how interactions between ERM implementation and some firm-specific factors. McShane et al. (2011) find evidence that traditional risk management leads to an increase in firm value in the US on average, even though this does not apply to firms with a higher ERM rating. The studies on emerging markets are very few due to data limitations and the literature is still in a developmental stage. Tahir and Razali's (2011) study is an exception as they find that ERM is not significantly related to firm value in Malaysia.

Corporate hedging in Turkey

Corporate risk management activities are quite recent in Turkey as Turkish companies have only started implementing International Financial Reporting Standards 7 (IFRS 7) since 2007 which requires firms to report quantitative and qualitative information on the risks of financial instruments (i.e., credit risk, liquidity risk, and market risk). Starting from 2012, Turkish public companies have had to establish early detection and management of risk committees in their organizations as legally required under Article 378 of the Turkish Commercial Code which constitutes a very important step in the development of corporate risk management in Turkey. Moreover, financial derivatives are quite new to Turkish financial markets, having started with the foundation of Turkish Derivatives Exchange in 2005. Moreover, ERM is also a recent phenomenon in Turkey and a growing number of firms have started implementing it recently following the global COSO guidelines, despite any local legal obligation.

Market reactions to corporate hedging in Turkey are difficult to predict due to two important reasons outlined in Ayturk et al. (2016): Firstly, ownership concentration among Turkish firms is very high (Yurtoglu 2000) and as outlined in the theories of managerial risk aversion, risk-averse owner-managers are more likely to use hedging tools to protect their own interests without necessarily benefiting the shareholders (Allayannis et al. 2012). Secondly, information asymmetries could hinder the ability of corporate hedging to boost market value. In particular, as Turkish publicly held firms are under no obligation to submit separate reports of their hedging practices to financial authorities, information asymmetries remain high even if firms hedge heavily. Allayannis et al. (2012) emphasize that investors struggle to differentiate between different motivations to use risk management tools (e.g., speculation or managerial benefits as opposed to genuine hedging motives) and hence, tend to undervalue genuine hedging practices if they cannot access the relevant information. An additional point that should be added is that as outlined in Lel (2012), strong



corporate governance encourages hedging to maximize shareholder value while weak corporate governance encourages speculation and protecting personal benefits when using risk management tools. In Turkey, the less stringent corporate governance regulations could also affect the relationship between risk management practices and firm value (Claessens and Yurtoglu 2013).

Data and methodology

This paper follows the mixed methods approach that has gained popularity in social research as an alternative to the single use of quantitative or qualitative research methods (Denscombe 2008). The sequencing of qualitative and quantitative methods differs within the mixed methods approach, depending on the researchers' rationalization and objectives. In this paper, we first conduct a quantitative study, as standard practice in the finance literature, which is followed by a qualitative study with 10 in-depth interviews.

Quantitative research

Data

The main source of financial data is from Thomson Reuters Datastream database, and the risk management activity data are hand-collected from the annual company report footnotes published in Borsa İstanbul (BIST) and Public Disclosure Platform of Turkey. Initially, all publicly traded Turkish firms with non-missing data on size (assets/sales) are considered (total of 509 firms). We focus on non-financial firms which are exposed to exchange rate risk by considering only the firms conducting exports and imports. Therefore, a screening procedure following Allayannis and Weston (2001) is conducted to first exclude the financial firms and, second exclude the companies that were not exposed to exchange rate risk by considering only the firms conducting exports and imports.³ Finally, we also exclude an observation of a firm if it indicates the use of derivatives for speculation purposes which leaves us with a final sample consisting of 139 firms over 6 years (2010–2015) which leads to 834 firm-year observations.⁴

Table 2 provides information on the frequencies of corporate hedging techniques among the firms in the sample per year and industry. We use Thomson Reuters FTSE/DJ Industry Classification Benchmark hierarchy to classify the industries,

³ It is verified that the excluded firms, which do not conduct exports and imports, do not perform any kind of corporate hedging activities such as interest rate hedging, commodity price hedging, or ERM. Therefore, excluding them does not bias our results. We thank an anonymous referee for this insight.

⁴ Turkish companies started implementing IFRS 7 since 2007 which requires firms to apply hedge accounting. Specifically, they are required to explicitly disclose how they hedge their risk exposures and they need to show such exposures separately for the financial instruments held for trading and speculation. Therefore, we rely on the information on the financial instruments provided in the annual reports while we exclude the use of derivatives for speculation purposes.

Table 2 Hedgers by year and industry

	N	Financial hedging with foreign currency derivatives (%)	ERM (%)	Operational hedging (%)
Panel A: firms by year				
2010	139	28.06	10.07	33.09
2011	139	30.22	10.79	34.53
2012	139	29.50	18.71	35.25
2013	139	25.90	24.46	35.25
2014	139	32.37	28.78	38.13
2015	139	35.25	28.78	39.57
Total	834	30.22	20.26	35.97
Panel B: firms by industry				
Basic materials	114	34.21	22.81	31.58
Consumer goods	324	25.31	23.77	23.77
Consumer services	30	53.33	6.67	60.00
Health care	6	0.00	33.33	100.00
Industrials	270	27.78	12.96	34.44
Oil and gas	6	33.33	0.00	100.00
Technology	48	37.50	8.33	95.83
Telecommunications	12	33.33	100.00	100.00
Utilities	24	66.67	45.83	25.00
Total	834	30.22	20.26	35.97

This table provides information on the frequencies of corporate hedging among the firms in the sample per year (Panel A) and industry (Panel B). The information is provided on the three types of risk management techniques: financial hedging with currency derivatives, ERM, and operational hedging

which gives a total of nine industry groups. Among the 834 firm-year observations, as shown in Table 2 Panel A, 30.22% use financial hedging through currency derivatives, 35.97% use operational hedging, and 20.26% conduct ERM. Further, we can observe that ERM users have increased between 2010 and 2015, justifying that ERM usage is a more recent phenomenon in risk management. In robustness checks, we also include financial hedging through interest rate and commodity derivatives. In our sample, 12.47% of the year-observations show interest rate derivatives use and while only 3.24% show commodity derivatives use.

Dependent variables Following the prior literature, we measure the firm value using Tobin's Q which is calculated as the ratio of the market value of equity plus total debts to the total assets following Chung and Pruitt (1994).⁵ We use the natural logarithm transformation of Tobin's Q ratio due to better statistical distribution properties as suggested by Hirsch and Seaks (1993). As in Allayannis and Weston (2001), we use industry-adjusted Tobin's Q ratios to control for industry differences.

⁵ As shown in Chung and Pruitt (1994), there is a high degree of correlation between these simple constructions of Tobin's Q and more rigorous approximations.

Table 3 Descriptive statistics on Tobin's Q

	<i>N</i>	Mean	Median	SD	P1	P99
All firms	834	1.21	0.91	1.09	0.29	6.20
FCD hedgers	252	1.02	0.89	0.84	0.27	3.38
FCD non-hedgers	582	1.29	0.93	1.18	0.34	6.48
Operational hedgers	300	1.01	0.88	0.55	0.28	2.51
Operational non-hedgers	534	1.32	0.94	1.29	0.29	7.59
ERM users	169	1.10	0.95	0.54	0.38	2.72
ERM non-users	665	1.23	0.91	1.19	0.28	6.61

This table presents descriptive statistics of Tobin's Q for all firms, hedgers, and non-hedgers, respectively

Industry-adjusted Tobin's Q is calculated as the difference between the natural logarithm of the firm's Tobin's Q and the natural logarithm of the median Tobin's Q of the industry that the firm belongs to for each year. Table 3 provides summary statistics for Tobin's Q.

Independent and control variables To measure the use of financial hedging in our sample, following the literature, our main variable of interest is a continuous variable that is measured as the ratio of the total notional value of foreign currency derivative instruments to the book value of total assets which indicates the extent of foreign currency derivative hedging.⁶ Some studies in the literature use dummy variables for the use of currency derivative instruments which does not capture the notional extent and can bias the results. The data for foreign currency derivatives are hand-collected from annual reports and we specifically searched the information in the footnotes for keywords "derivative," "hedge," "forward," "swap," "option," "futures," and "financial risk." In the same way, we collect information for interest rate and commodity derivatives which are used in robustness checks.⁷ Table 4 Panel A provides descriptive statistics of financial hedging variables. Note that the number of observations for the extent of hedging is lower than observations of derivatives use for dummy variables because some firms choose not to disclose the notional amount of derivatives.

Following Allayannis et al. (2001), we use four proxies for a firm's operational hedging: (i) the number of countries in which a firm operates ($\ln(\text{number of countries})$), (ii) the number of regions where the firm has subsidiaries (Nine regions include Europe, NAFTA (Canada, USA, and Mexico), Eastern Europe, Western Europe, Central and South America, Africa, Middle East, East Asia, and Other Asia) ($\ln(\text{number of regions})$), (iii) the geographic dispersion of its subsidiaries across different countries (Dispersion index I), (iv) the geographic dispersion of its subsidiaries across regions (Dispersion index II). Dispersion indices I and II are calculated as

⁶ We use the net position of derivatives that are hedging opposite positions.

⁷ IFRS 7 requires Turkish companies to disclose the different types of instruments that are used to hedge market risk which is provided separately for currency risk, interest rate risk, and commodity price risk. Therefore, we were able to collect the extent of hedging information separately for those types of market risk from annual reports.

Table 4 Descriptive statistics on hedging variables

	<i>N</i>	Mean	Median	SD	P1	P99
Panel A: financial hedging variables						
Foreign currency derivatives use dummy	834	0.30	0.00	0.46	0.00	1.00
FCD extent	816	0.04	0.00	0.11	0.00	0.49
Interest rate derivatives use dummy	834	0.12	0.00	0.33	0.00	1.00
IRD extent	825	0.02	0.00	0.07	0.00	0.38
Panel B: operational hedging variables						
Operational hedging dummy	834	0.36	0.00	0.48	0.00	1.00
Number of countries firms operate in	834	2.53	1.00	3.54	1.00	19.00
Number of regions firms have subsidiaries in	834	1.80	1.00	1.39	1.00	7.00
HHI over all the countries in which firms operate	834	0.25	0.00	0.35	0.00	0.95
HHI over all the regions in which firms operate	834	0.22	0.00	0.32	0.00	0.86
Panel C: ERM variables						
ERM dummy	834	0.20	0.00	0.40	0.00	1.00

This table presents descriptive statistics on hedging variables with Panel A focusing on financial hedging, Panel B on operational hedging, and Panel C on ERM variables, respectively

Hirschman–Herfindahl concentration index (HHI) over all the countries or regions in which a firm operates. For example, our third measure of geographic dispersion for firm i is calculated as

$$\text{Dispersion}_i = 1 - \sum_{j=1}^K \left[\frac{\text{No. subsidiaries}_j}{\text{Total no. subsidiaries}_i} \right]^2,$$

where K is the total number of countries in which firm i operates. The dispersion index is close to zero if a firm has subsidiaries in one region and equal to one if a firm has subsidiaries in many regions. Operational hedging information is also hand-collected from the annual reports and Table 4 Panel B indicates that the mean number of countries that the firms operate in through the establishment of subsidiaries is 2.53 for our sample.

As indicated in Sect. 2.3, ERM implements a more holistic approach to risk management. While ERM captures the functions of traditional risk management, it additionally focuses on further risks such as operational or strategic risks (McShane et al. 2011). To measure ERM activity, we use a dummy variable equal to 1 if firms conduct ERM and 0 otherwise. ERM information is also gathered from the annual reports by searching the text strings: “enterprise risk management,” “chief risk officer,” “risk committee,” and “strategic risk management,” following Hoyt and Liebenberg (2011). Table 4 Panel C provides descriptive statistics of ERM variable. We use an indicator variable for ERM implementation because there are no further data available on the details of the ERM program of the Turkish companies. The data unavailability on ERM is quite prevalent in the related literature, and data regarding the extent to which ERM is implemented in a firm are the main challenges in the empirical literature (Gartzert

Table 5 Descriptive statistics on firm characteristics

	<i>N</i>	Mean	Median	SD	P1	P99
Total assets (million TRY)	834	1958.79	391.97	4436.86	26.25	21,677.77
Sales (million TRY)	834	1788.86	329.09	4423.86	12.40	18,106.76
MV of equity (million TRY)	834	1569.20	298.54	3794.15	8.13	21,476.40
Long-term debt (million TRY)	834	381.35	19.79	1274.87	0.00	6679.07
ROA	834	0.05	0.04	0.25	-0.19	0.27
Dividend dummy	834	0.44	0.00	0.50	0.00	1.00
LT debt/equity	834	0.27	0.22	0.38	0.00	0.83
Capex/sales	834	0.08	0.04	0.13	0.00	0.63
Foreign sales/sales	834	0.27	0.20	0.25	0.00	1.00
Cash/current liabilities	834	0.47	0.19	0.91	0.00	3.87

This table shows descriptive statistics of the control variables for the whole sample

and Martin 2015). Therefore, most studies employ indicator variables as measures of ERM implementation (Tahir and Razali 2011; Hoyt and Liebenberg 2011). We note that a limitation of measuring ERM with a dummy variable is that it does not capture the quality and extent of ERM program implementation, which could reduce the power of our tests.

Following prior studies (Allayannis and Weston 2001; Jin and Jorion 2006), several control variables are chosen in order to isolate the effects of corporate risk management on firm value: firm size (natural logarithm of total assets), liquidity (cash and equivalents to total assets), leverage (long-term debt to market capitalization), profitability (net income to total assets), investment opportunities (capital expenditures to sales), access to financial markets (a dummy variable equal to 1 if the firm makes any dividend to shareholders in the current year and 0 otherwise), and geographical diversification (foreign sales to total sales). Firm size is adjusted for inflation as it is the only variable in levels other than a ratio. Table 5 presents descriptive statistics of our control variables for the whole sample.

We present Pearson correlation coefficients between independent variables in Table 6. Correlation coefficients being relatively low do not imply the possibility of facing multicollinearity problem.

Methodology

To investigate whether corporate risk management increases firm value, we first estimate the following econometric model using fixed effects panel data estimation techniques as confirmed by the Hausman test (with test statistic 28.31 and significance level of 5%):

$$\begin{aligned} \text{Firm value}_{it} = & \alpha + \beta_1 * \text{Fin.Hed.}_{it} + \beta_2 * \text{Oper.Hed.}_{it} + \beta_3 * \text{ERM} \\ & + \beta_4 * (\text{Fin.Hed.}_{it} * \text{Oper.Hed.}_{it}) + \beta_5 * (\text{Fin.Hed.} * \text{ERM})_{it} \\ & + \beta_6 * (\text{Oper.Hed.} * \text{ERM})_{it} + \beta_7 * \text{Control Vrbs} + \varepsilon_{it} \end{aligned}$$

Table 6 Correlation table

	Size	Leverage	Profitability	Liquidity	Cap. exp/ sales	Dividend	Foreign sales/sales	Fin. hedg- ing	ERM	Oper. hedging	Fin. hedg. * oper. hedg.	Fin. hedg. * ERM	Oper. hedg.* ERM
Size	1												
Leverage	0.1037*	1											
Profitability	0.0044	0.0272	1										
Liquidity	-0.0204	-0.0925*	0.1165*	1									
Cap.exp/ sales	0.2045*	0.2646*	-0.0383	-0.0132	1								
Dividend dummy	0.3428*	-0.2187*	0.1265*	0.2481*	-0.0742*	1							
Foreign sales/ sales	-0.0575	0.0006	0.0055	-0.0037	-0.0180	-0.0528	1						
Financial hedging	0.0992*	0.0568	-0.0436	-0.0677	-0.0517	0.0148	0.1917*	1					
ERM	0.4041*	0.0624	0.0050	-0.0282	0.0922*	0.1278*	0.0293	0.2038*	1				
Oper. hedg- ing	0.5618*	0.0229	-0.0026	0.0145	0.0593	0.1763*	-0.0411	0.1202*	0.3398*	1			
Fin.hedg. * Oper. hedging	0.1766*	0.0334	-0.0181	-0.0565	-0.0436	0.0388	0.1594*	0.6205*	0.2148*	0.3680*	1		
Fin.hedging * ERM	0.0965*	0.0655	-0.0236	-0.0696*	-0.0342	0.0090	0.1615*	0.7661*	0.3684*	0.1407*	0.6706*	1	
Oper. hedging * ERM	0.4474*	0.0393	0.0144	0.0315	0.1123*	0.1617*	0.0636	0.1504*	0.6615*	0.6732*	0.3660*	0.2631*	1

This table presents correlation coefficients among independent variables. Coefficients with an asterisk (*) are significantly different from zero at the 5% level

We include the year and industry dummies to control for heterogeneity between years and between different industries. We use standard errors clustered at the firm level to account for heteroskedasticity and autocorrelation. Jin and Jorion (2006) and Magee (2009) highlight that endogeneity is a crucial concern and that it is important to control for the possibility of feedback from past amounts of firm value to the current values of hedging. The other possible sources of endogeneity include unobserved heterogeneity and possible omitted variables. Most studies in the literature use a dynamic model with system or one-step difference GMM estimators (Magee 2009; Búa et al. 2015; Ayturk et al. 2016) to control for endogeneity due to the autoregressive feature of the data. Specifically, firm value is correlated with its lagged values, which is also present in our case. Therefore, in order to control for possible endogeneity concerns, we use a dynamic panel with one-step difference GMM estimators, proposed by Arellano and Bond (1991). As pointed out in the literature, it is hard to find good contemporaneous instrumental variables. Therefore, we choose to use right-hand side variables in the model lagged twice or more as instrumental variables which are obtained by using the orthogonality conditions that exist between lagged values of the right-hand side variables. We perform some diagnostic tests to test the relevance and validity of one-step difference GMM dynamic model, which include Sargan test, Hansen test, and Arellano–Bond tests, and AR(1) and AR(2), for autocorrelation.

Qualitative research

The paper uses an interpretivist epistemology in its qualitative approach, using in-depth interviews to answer the research questions (Myers 2013). We conducted a total of 10 face-to-face interviews with selected finance and risk management professionals from firms in the dataset which generated five hours of interview data. Respondent details and their corresponding codes are illustrated in Table 7. The interview comprised open questions which are provided in the Appendix 1. The insights emerging from the literature review and quantitative analysis provided the guidelines for interview questions that focused on two areas: (1) the practical use of risk management strategies in Turkish companies and (2) the informants' perceptions on the market valuation of Turkish companies. Informants were chosen using purposeful sampling techniques, identifying individuals who could provide richness and depth to answer the research questions (Patton 2015). The interviewers purposefully allowed informants to share their own experiences and did not reveal the findings emerging from the quantitative part of the study as this could bias the data emerging from the interviews. The interviews were recorded and analyzed by transcribing verbatim to maintain the precision of the data, and standard thematic analysis is employed using the NVivo software. Specifically, the data were coded and analyzed in a template, to identify some themes and explanations (Myers 2013).

Table 7 Description of participants and their corresponding codes

Participant code	Participant description
Participant-01	Chief Financial Officer (CFO) in a manufacturing company
Participant-02	Senior ERM Specialist in a telecommunication and technology company
Participant-03	Risk Management Director in a holding company
Participant-04	Risk and Insurance coordinator in an energy company
Participant-05	Finance Deputy General Manager in a certification company
Participant-06	Risk and Compliance Coordinator in a holding company
Participant-07	Director of Finance and Risk Management in a manufacturing company
Participant-08	Risk Analyst in an energy company
Participant-09	Head of Internal Audit and Risk Control in a manufacturing company
Participant-10	Finance Analyst in a textile company

The table provides information on the 10 participants of the in-depth interviews, participant codes, and participant descriptions

Results and discussion

Results of quantitative analysis

Table 8 shows the quantitative analysis of regression results where the dependent variables are, respectively, the “natural logarithm of Tobin’s Q” in columns (1)–(4) and “industry-adjusted Tobin’s Q” in columns (5) and (6) and standard errors are reported in parentheses. While columns (1) and (2) are estimated via the fixed effects panel data method, columns (3)–(6) are estimated using dynamic panel data regression with one-step difference GMM. We include the year and industry dummies to control for heterogeneity between years and between different industries. We use standard errors clustered at the firm level to account for heteroskedasticity and autocorrelation.

While Table 8 column (1) suggests that financial hedging and ERM do not have significant effect on firm value, operational hedging seems to have a significant positive impact on Tobin’s Q. We report the results using operational hedging proxy (i), which is the natural logarithm of the number of countries in which a firm operates. Results using the other three operational hedging proxies are robust and not reported but available upon request. We consider interaction effects in column (2) to see whether the simultaneous use of different corporate risk management strategies has any impact on firm value and find that the only significant impact comes from the interaction of Financial Hedging and ERM with the coefficient being positive and significant at 10% level. However, the results with fixed effects panel data estimators need to be interpreted with caution and they might be biased due to endogeneity problems mentioned in Sect. 3.1.2.

In order to control for endogeneity, we use a dynamic panel with one-step difference GMM estimators in columns (3)–(6) which shows that a dynamic model is relevant as the lagged firm value is significant and the past values of Tobin’s Q affect the current firm value. Columns (3) and (5) incorporate the effects of financial hedging, operational hedging, and ERM (without interactions) and with the dependent variable

logarithm of Tobin's Q and industry-adjusted Tobin's Q, respectively. Columns (4) and (6) include interaction terms, with dependent variables of the natural logarithm of Tobin's Q and industry-adjusted Tobin's Q, respectively. The results suggest that none of the financial hedging, operational hedging, or ERM strategies have a significant influence on firm value and their interactions do not have a significant impact, either. Operational hedging and the interaction of Financial Hedging and ERM, which were positively significant in fixed effects panel data estimations, are no longer significant once the model accounts for potential endogeneity. The diagnostic tests include Sargan and Hansen test and Arellano–Bond tests for autocorrelation, AR(1) and AR(2), presented at the bottom of Table 8, confirm the relevance and validity of one-step difference GMM dynamic model. Some control variables in our analysis are able to explain firm value, which are profitability, liquidity, and investment opportunities, with the signs founded in the theoretical framework. While liquidity and investment opportunities are significantly and positively related to firm value, profitability turns out to be significantly and negatively related to firm value.

Overall, our results imply that corporate risk management activities, including financial and operational risk management and ERM, are not significantly associated with the firm value in the context of Turkish non-financial firms. This result is line with Ayturk et al. (2016), who find that financial hedging does not affect firm value in the Turkish market. We further extend their results by examining operational hedging and ERM and the interactions of these corporate risk management activities and still find no value premium.

Results of qualitative analysis

In the qualitative part of our analysis, we conducted 10 interviews to offer deeper insights into the value relevance of risk management activities in the Turkish context. Table 9 illustrates the themes and their frequencies that appeared from the standard thematic analysis of the interview data. In the rest of this section, we present the themes and explanations emerged from the qualitative study and the literature review.

Firstly, 80% of the informants unanimously provided the caveat that the disclosure of hedging activities, particularly for derivatives use, is problematic in the Turkish context, reducing the value-creating potential of corporate hedging. As argued by DeMarzo and Duffie (1995) and Dadalt et al. (2002), financial hedging and its proper disclosure improves the informativeness of financial reports and reduces asymmetric information between managers and outsiders. Because of limited and unstandardized information in the Turkish context, investors may not be able to anticipate the motive behind corporate risk management activities and not be able to use this information in their company valuations (Ayturk et al. 2016). One of our informants, a Finance Deputy Manager, mentioned that:

Turkish companies would refuse to communicate information and be transparent on their strategies and operations due to intense competition in the market unless it is obligatory by regulations. Even though Turkish companies have started implementing IFRS 7, it is more important to judge

Table 8 Corporate risk management and firm value regression results

Dependent variable	(1) Ln(Tobin's Q) FE	(2) Ln(Tobin's Q) FE	(3) Ln(Tobin's Q) GMM	(4) Ln(Tobin's Q) GMM	(5) Industry-adjusted Q GMM	(6) Industry-adjusted Q GMM
Ln (Qt-1)			0.472*** (0.13)	0.462*** (0.12)		
Ln (Qt-1)_Ind.Adj.					0.451*** (0.13)	0.439*** (0.12)
Fin. hedging	0.056 (0.09)	- 0.062 (0.18)	- 1.137 (0.83)	- 0.576 (0.48)	- 1.136 (0.81)	- 0.583 (0.47)
ERM dummy	0.053 (0.06)	0.072 (0.07)	0.042 (0.24)	0.088 (0.26)	0.057 (0.24)	0.133 (0.26)
Oper. hedging	0.237*** (0.06)	0.247*** (0.06)	0.515 (0.65)	0.6 (0.72)	0.43 (0.65)	0.528 (0.71)
Fin. hedg. * Oper. hedging		- 0.092 (0.15)		0.245 (0.76)		0.271 (0.79)
Fin. hedging * ERM		0.376* (0.19)		- 0.672 (1.33)		- 0.742 (1.35)
Oper. hedging * ERM		- 0.048 (0.07)		0.04 (0.16)		0.031 (0.16)
Ln (total assets)	0.018 (0.09)	0.02 (0.09)	- 0.295 (0.28)	- 0.346 (0.23)	- 0.369 (0.27)	- 0.412* (0.23)
Leverage	- 0.080*** (0.03)	- 0.082*** (0.03)	- 0.08 (0.09)	- 0.071 (0.09)	- 0.089 (0.09)	- 0.081 (0.09)
Profitability	0.037 (0.03)	0.038 (0.03)	- 0.118* (0.07)	- 0.127** (0.06)	- 0.124* (0.07)	- 0.132** (0.06)
Liquidity	0.072*** (0.02)	0.072*** (0.02)	0.167*** (0.08)	0.153** (0.07)	0.173** (0.08)	0.156** (0.07)



Table 8 (continued)

Dependent variable	(1) Ln(Tobin's Q) FE	(2) Ln(Tobin's Q) FE	(3) Ln(Tobin's Q) GMM	(4) Ln(Tobin's Q) GMM	(5) Industry-adjusted Q GMM	(6) Industry-adjusted Q GMM
Cap. exp./sales	0.134 (0.08)	0.139* (0.08)	0.961** (0.47)	0.876** (0.41)	0.983** (0.49)	0.893** (0.42)
Dividend dummy	0.037 (0.03)	0.042 (0.03)	0.027 (0.17)	-0.002 (0.16)	0.036 (0.17)	0.007 (0.16)
Foreign sales/sales	-0.037 (0.14)	-0.03 (0.13)	0.742 (0.49)	0.582 (0.45)	0.722 (0.49)	0.536 (0.45)
Constant	-0.281 -1.17	-0.319 -1.14				
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	No	No	Yes	Yes	Yes	Yes
R ²	0.174	0.178				
Observations	834	834	556	556	556	556
Number of groups	139	139	139	139	139	139
Number of instruments			48	60	48	60
AR1			-4.0***	-4.5***	-4.0***	-4.4***
AR2			0.9	1	1	1.1
Sargan			28.2	40.8	27.6	39.5
Hansen			24.5	39.3	23.8	39.1

This table presents corporate risk management and firm value regression results. We use firm-level clustered robust standard errors for heteroskedasticity and autocorrelation. Standard errors are reported in parentheses. Columns (1) and (2) are estimated by using fixed effects panel data regressions where the dependent variable is Ln(Tobin's Q) for both columns. Columns (3) and (4) are estimated by using dynamic panel data regressions with one-step difference GMM, employing Ln(Tobin's Q) as the dependent variable. Columns (4) and (5) are also estimated by using dynamic panel data regressions with one-step difference GMM, but using Ln(Industry-adjusted Tobin's Q) as the dependent variable

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

whether they understand and adopt risk management into their daily operations or instead just do it for the sake of complying with the laws. (Participant-05).

While another informant, a Risk and Compliance Coordinator, stated that:

Turkish public companies provide very limited information on risk management in their financial reports. This happens because when there is no regulatory pressure for detailed disclosure in Turkey, companies would not detail any of their risks with a purpose of not bothering investors and placing their company into any kind of difficulty. (Participant-06).

Interestingly, companies preferred to limit the disclosure of their risk management activities in order to avoid a growing demand for further information:

There are more activities undertaken on risk management in our company, but the minimum amount of information is provided to the market. This is because we refrain from the binding effect which could lead authorities to expect from us to do all of these activities no matter what. (Participant-04).

The second theme that has emerged from the interviews is that risk management does not receive enough support from the top management, which results from weaker corporate governance mechanisms in the Turkish context. Many studies (e.g., Walker et al. 2002; Young and Jordan 2008) confirm that a risk management and ERM initiative cannot be successful without a strong commitment from top management. The interviews provided strong support for this argument, with 90% of the informants mentioning the theme during the interviews. For example, one of our informants, a Risk Analyst, mentioned that:

In an economic turbulent environment like Turkey, the focus of the companies is to spend their energy on daily activities to keep them alive, and therefore supporting functions like risk management are of secondary importance. It is therefore quite normal that investors would not consider risk management activities of companies in their investment decisions because the whole process needs to start from how much the company itself gives importance to risk management. (Participant-08).

Another important insight emerging frequently from the interviews revealed the ambiguity around the concept of risk management and the unclear job descriptions of risk management professionals based in Turkish companies. Such lack of clarity seemed to hamper the effectiveness of risk management across the company as well as limiting its value creation potential in markets. For example, one of our informants stated that:

The risk management departments in different companies do not have standard and clear job descriptions and no standard reporting lines in the organization. Risk issues are also very dynamic and constantly changing in every company, therefore different risk management activities are prioritized according to relevant conjuncture. (Participant-06).

Table 9 Themes from the interviews

Themes	Frequency	Participants
(1) Low regulatory stringency around disclosure of risk management practices	8/10	Participants 01, 02, 03, 04, 06, 08, 09, 10
(2) Low level of support for risk management from top management	9/10	Participants 02, 03, 04, 05, 06, 07, 08, 09, 10
(3) The ambiguity around the concept of risk management and the unclear job descriptions	7/10	Participants 02, 03, 04, 06, 08, 09, 10
(4) Managerial risk aversion motives instead of value maximization arguments	5/10	Participants 01, 05, 07, 08, 10
(5) Deliberate and indeliberate misuse of financial hedging instruments.	3/10	Participants 05, 07, 10

This table presents the themes and their frequencies emerged from the in-depth interviews that were conducted with 10 finance and risk professionals. The final column indicates the specific participants that mention the corresponding theme during their interviews

Interviews also provided some evidence that managerial risk aversion motives, instead of shareholder value maximization, lead corporate risk management practices in Turkey, which was mentioned in half of the interviews. One Chief Finance Officer stated that:

In turbulent times, astronomical profits or losses may be encountered. We, as managers of the company, can use risk management techniques to guarantee a certain profitability and stability. In that case, there will be no periodic high profits or losses, but stable profits will be maintained and consequently, the reputation of the company would be preserved. (Participant-01).

Turkish market is typically characterized by high ownership concentration (Yurtoglu 2000), weaker investor protection, and corporate governance (La Porta et al. 2002; Claessens and Yurtoglu 2013). Therefore, it is expected that outside investors would anticipate that corporate risk management motives are not related to value maximization arguments, but instead, are more related to managerial risk aversion motives and consequently they do not significantly consider risk management activities of firms in their valuations (Khediri 2010; Allayannis et al. 2012).

Finally, there was support for the view that speculation motives of managers and misuse of financial hedging instruments exist in Turkey. Firms may use financial hedging to speculate, with the intent to make a profit by taking a position based on a market view and increase risk rather than mitigating it, and this may not benefit investors on average (Geczy et al. 2007; Allayannis et al. 2012). 30% of our respondents provided support for these arguments for Turkey in our qualitative analysis. For example, one of our informants, a Director of Finance and Risk Management, has commented that:

I think that financial derivatives need to be used with expertise and the approach should be completely quantitative disregarding market expectations on future prices, which does not hold for Turkish companies. Misuse of financial instruments due to lack of expertise might lead to significant losses. (Participant-07).

Another informant, a Finance Deputy General Manager, mentioned that:

I do not think that financial hedging through derivatives is common and well understood by Turkish companies. Hence, there is few amount of disclosed information available on those strategies. (Participant-05).

Overall, our results imply that corporate risk management activities, including financial and operational risk management and ERM, are not significantly associated with the firm value in the context of Turkish non-financial firms. Main explanations from our qualitative study and the literature review stand to be (1) limited and unstandardized risk management disclosures, (2) lack of top management support resulting from weaker corporate governance mechanisms, (3) ambiguity around the concept of risk management and the unclear job descriptions, (4) managerial risk aversion motives, and (5) speculation motives and misuse of financial hedging instruments.

Robustness tests

We perform several tests to explore the robustness of our results from the quantitative study. First, we use two additional measures for Tobin's Q which are $[(\text{Market value of equity} + \text{Total liabilities}) / \text{Total Assets}]$ and $[\text{Market value of equity} / \text{Total Assets}]$ and our results, not reported but available upon request, do not change. Furthermore, we consider other financial hedging techniques like the extent of interest rate derivatives and commodity derivatives and conclude that neither of them is significantly related to firm value. We also considered dummy variables as proxies for foreign currency hedging and operational hedging and our results do not change. We considered alternative proxies for operational hedging as provided in Sect. 3.1.1.2 by (ii), (iii), and (iv) and obtain similar conclusions.

Conclusions

In this paper, we investigate the effect of corporate risk management on firm value in emerging markets by focusing on financial and operational risk management and ERM. We use a unique hand-collected sample of non-financial Turkish companies for the years 2010–2015 and use the mixed research methods approach. We first conduct a quantitative study as standard practice in finance literature which is followed by a qualitative study with in-depth interviews with selected finance and risk management professionals to offer deeper insights into the findings and to reflect the real market practices in emerging market contexts. Our quantitative methodology involves dynamic panel regression with one-step difference GMM estimators to deal with endogeneity. Our results, being robust to alternative measures of Tobin's Q and to the effect of outliers, reveal that none of these three risk management strategies increase firm value in the Turkish context.

The contributions of the paper are threefold. First, it sheds light on the valuation effects of risk management practices in the context of Turkey, an emerging country and adds significantly to the insights of the literature that predominantly focuses on developed economies. The paper emphasizes how investors assess corporate risk management activities in an emerging market like Turkey, which is characterized by high ownership concentration and weaker investor protection and corporate governance. The findings reveal that risk management activities in Turkey are undervalued based on a range of different risk management strategies (i.e., financial, operational, and ERM). The paper argues that the lack of a close relationship between risk management and firm value results due to (1) low regulatory stringency around disclosure of risk management practices, leading to high levels of information asymmetry in the markets, (2) low level of support for risk management from top management which results from weak corporate governance mechanisms, (3) corporate risk management motives being related to managerial risk aversion motives instead of value maximization arguments, (4) the ambiguity around the concept of risk management and the unclear

job descriptions, and (5) deliberate and indeliberate misuse of financial hedging instruments that suggest speculative actions can be masked as risk management. Secondly, the paper sheds light on the valuation effects of ERM besides the more traditional risk management strategies of financial and operational hedging. In doing so, the paper becomes the first in the literature to include such a wide range of risk management activities and to examine their effects separately and jointly. Finally, the paper contributes to the risk management literature by combining quantitative and qualitative techniques in a mixed method approach and, thereby contributing deeper insights than what would be possible with the sole use of quantitative techniques.

We suggest that future research in this area should further explore better proxies for operational hedging and ERM that shows the nature and extent of these risk management strategies in a more refined way. Moreover, ERM implementation and necessary know-how need to be improved in emerging markets like Turkey. We may also comment that the authorities in emerging markets need to improve corporate governance practices, corporate information disclosures on risk management, and qualify risk management as a recognized profession in the corporations with standardized job descriptions and reporting lines. Moreover, a risk management and ERM initiative cannot be successful without a strong commitment from top management, therefore top management support is very crucial. From bottom-to-top, more actions need to be taken as well in order explain and prove the importance of risk management to top management executives.

Appendix 1: interview questions

-
1. Do you conduct risk management activities at your company? What kind of risk management activities do you perform and what are their objectives?
 - (a) How do you manage your financial risks? Do you use financial derivative instruments?
 - (b) Do you implement Enterprise Risk Management (ERM) activities? If so, when did you start performing ERM at your company?
 - (c) How do you manage your operational risks?
 2. Could you explain the organizational structure of risk management function at your company? Which department is responsible for what type of activities? How are they followed up and supervised?
 3. Could you explain the motives behind different types of corporate risk management activities held in your company? How about other Turkish companies and other emerging markets? Would the motives differ for developed markets?
 4. Do you think investors in Turkey consider the risk management activities of Turkish companies in their investment decisions?
 5. How do you disclose the risk management activities held by your company? What are the legal requirements for risk management disclosures? What differences do you see in the risk management disclosures between Turkey and the developed countries?
 6. What do you think should be done to improve the corporate risk management functions in Turkey?
-

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