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Dividends from unrealized earnings and default risk

Ester Chen[1] · Ilanit Gavious[2] · Nadav Steinberg[3]

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Abstract
Using hand-collected data on Israeli firms' unrealized earnings and debt restructurings following adoption of the International Financial Reporting Standards (IFRS), we investigate whether and how dividend payouts based on unrealized revaluation earnings affect a firm's default risk. Our results indicate that, in the era of fair value accounting, whether the dividend payment originates from unrealized or realized earnings has a significant effect on a firm's default risk, above and beyond the effect of the extent of the payment. Specifically, controlling for various determinants of financial risk, including the amount of the dividends paid, we find that firms are four times more likely to subsequently require debt restructuring, if they distribute dividends based on unrealized earnings. However, this enhanced risk seems to be mispriced by the market: cost of debt proxies are generally insignificantly different for these firms, following payouts originating from unrealized earnings, than for firms that never make such risky payouts.

Keywords Cost of debt · Default risk · Dividends · Fair value accounting

JEL classification M21 · M41 · G35

1 Introduction

In the era of fair value accounting, firms are allowed to recognize unrealized earnings that arise from changes in the fair values of assets and liabilities in their income statements. This ability has given rise to a debate about the possible improper use of these earnings for private benefits that conflict with the interests of other firm stakeholders. Studies examining firms' reported earnings, following the adoption of fair

✉ Ilanit Gavious
madaril@bgu.ac.il

[1] Peres Academic Center, Rehovot, Israel

[2] Guilford Glazer Faculty of Business and Management, Department of Business Administration, Ben-Gurion University of the Negev, PO Box 653, 84105 Beer-Sheva, Israel

[3] Bank of Israel, Jerusalem, Israel

value accounting rules, have generally focused on the extent to which they represent real economic earnings, rather than managed earnings.[1]

In this study, we explore a hitherto unexamined aspect of the ability to recognize unrealized earnings: the effect of distributing dividends to shareholders based on earnings *before they are realized* on the firm's default risk. Studies examining the effects of dividend payouts usually focus on the extent (i.e., the level or the change in the amount) of the dividend payments, rather than on their source (i.e., the type of earnings underlying the payout).

The overall effect of dividend payouts on a firm's default risk and thus on its cost of debt is unpredictable. This unpredictability is due to the opposing implications for debtholders of different hypotheses in the dividend literature. According to the information content hypothesis, the distribution of dividends conveys information about the firm's current/future cash flows (e.g., Bhattacharya 1979; John and Williams 1985; Miller and Rock 1985; DeAngelo et al. 2000; Baker and Wurgler 2004; DeAngelo and DeAngelo 2006; Guttman et al. 2010; Lambrecht and Myers 2012). Specifically, such a distribution signals stronger earnings power for the firm and hence less financial risk. Additionally, as per free cash flow- (FCF-) centric theories of dividends, the distribution of the firm's FCF as dividends mitigates investor concerns about overinvestment and expropriation (e.g., Jensen 1986; Lang and Litzenberger 1989), thereby reducing the agency cost of debt. On the other hand, the disbursement of FCF as dividends increases the firm's dependence on external funding sources for future growth. According to the wealth redistribution hypothesis, the distribution of dividends aggravates the conflict of interests between the firm and its debtholders because, from the debtholders' perspective, dividends paid to shareholders transfer wealth from debtholders to shareholders, thereby placing the former at greater risk (e.g., Black and Cox 1976; Kalay 1982; Galai and Wiener 2015).

This study turns the spotlight from the extent of the payout to its origin, with a focus on unrealized earnings. Notably, the effects of dividend payouts described above are even stronger if the payments are based on unrealized earnings, because unrealized earnings can reverse in the future (the clawback problem). In other words, since the distribution of dividends is in the form of *certain cash*, whereas unrealized earnings are in the form of *opaque noncash items*, the distribution of dividends based on unrealized earnings can place the firm's debtholders at greater risk, over and above the potential risk associated with the extent of the payment.[2] However, dividends that originate from

[1] These studies by and large use firms that adopted the International Financial Reporting Standards (IFRS). In comparison to US GAAP, which allows the measurement of financial instruments only at fair value, the international standards permit the measurement of different financial statement items at fair value. As a result, the impact of fair value accounting on financial reporting is far more substantial in IFRS-adopting countries than in the US. See De George et al. (2016) for a review of the literature on the effects of IFRS adoption on financial reporting quality, corporate decision making, etc.

[2] To illustrate the increase in the riskiness of the firm following a payout based on unrealized earnings, assume that a firm owns a building with a historical cost of 100 and cash in the amount of 100. Assume also that the market value of the building is 200. The adoption of IFRS allows the firm to recognize an unrealized profit of 100 by switching from historical cost to fair value. Now, assume that the firm decides to distribute this profit and uses its cash to pay the dividend. Following the payment, the firm owns the same building valued at 200 and has no cash. As a result, the riskiness of the firm increases because it is now 100% invested in the risky asset while it was only 67% invested prior to the dividend payment. We thank an anonymous referee for offering this illustration.

unrealized earnings may be even more powerful in demonstrating the management's commitment to the diligent use of the firm's resources and in signaling the firm's financial solidity. Investors might infer that only the most solid firms would pay cash dividends based on paper profits. All in all, the implications of dividends originating from unrealized earnings for debtholders are not foreseen.

We explore the effect of the distribution of dividends from unrealized earnings (hereafter DFUR) on a firm's default risk and on its cost of debt in an IFRS-adopting country. By focusing on a single country, we maintain the institutional, legal, and economic factors affecting all the sample firms constant, thereby avoiding the onerous need to control for these factors that is characteristic of cross-country studies. Note that using a single IFRS-adopting country enables us to examine the research question across various industries. Unlike US GAAP, which permits the measurement of financial instruments only at fair value[3] and hence affects mainly financial firms (e.g., Riedl and Serafeim 2011), IFRS allows the measurement of various financial statement items, such as financial instruments, investment property, investment in subsidiaries, and investment in associates and joint ventures, at fair value.[4] Given the different reporting incentives as well as different accounting and regulatory requirements of financial firms compared to firms in other industries, the generalization of results based on a sample of financial firms can be problematic.

Our sample comprises Israeli public companies that adopted IFRS in 2007.[5] As in many IFRS-adopting countries, the Corporate Law in Israel, which allows a firm to distribute dividends from its retained accounting earnings, does not distinguish between realized and unrealized earnings.[6] We identify firms that distributed dividends originating from unrealized earnings (henceforth DFUR firms), using a classification scheme consistent with that of Chen and Gavious (2016). This scheme consists of a set of cumulative conditions that a firm must meet to be classified as DFUR. Specifically, a firm is classified this way only if it has paid dividends in amounts that exceed *all* of its distributable *realized* earnings. Thus the assumption underlying the classification of firms as DFUR versus non-DFUR is that all realized earnings are distributed before any unrealized earnings are distributed. Setting these rigorous conditions is essential to our study to maximize the likelihood that our determination about whether the firm has distributed dividends based on unrealized earnings is correct. To determine the DFUR classification and conduct the various empirical analyses, all of the information about the sample firms' unrealized revaluation earnings was hand-collected from their annual financial statements.[7] In addition, we obtained access to the

[3] FASB Statement No. 115 *Accounting for Certain Investments in Debt and Equity Securities* (1993), FASB Statement No. 133 *Accounting for Derivative Instruments and Hedging Activities* (1998), and FASB Statement No. 159 *The Fair Value Option for Financial Assets and Financial Liabilities* (2007).

[4] IAS No. 39 *Financial Instruments: Recognition and Measurement* (as revised in 2005; later replaced by IFRS 9 *Financial Instruments*); IAS No. 40 *Investment Property* (as revised in 2005); IAS No. 27 *Consolidated and Separate Financial Statements* (as revised in 2005); IAS No. 28 *Investment in Associates and Joint Ventures* (as revised in 2005); IFRS 3 *Business Combinations* (as revised in 2008).

[5] Before their adoption of IFRS, the firms reported their financial statements in accordance with the Israeli GAAP, which was mainly influenced by US GAAP. For a detailed description of the differences between Israeli GAAP and IFRS, see Markelevich et al. (2011).

[6] See Sections 302 and 303 of the Israeli Corporate Law. Later in this section, we provide examples of countries in which the IFRS amounts do not have to be modified to determine distributable profits.

[7] This information does not appear on electronic databases, such as Compustat.

Bank of Israel's manually collected corporate default database, which includes detailed information about firms that have undergone debt restructuring since 2008. Overall, our sample consists of 292 firms (2652 pre- and post-IFRS firm-years) with tradable debt (bonds), 94 of which underwent debt restructuring at least once during the post-IFRS sample period of 2008–2013. Twenty-six percent of the firms (75 firms) distributed dividends based on unrealized earnings at least once following the adoption of IFRS. The average DFUR firm paid dividends based on unrealized gains two to three times during the sample's six-year post-IFRS period. Of these firms, 39% defaulted on their debt and entered a debt-restructuring process, usually two to three years after the payment of DFUR. By contrast, only 24% of the non-DFUR firms required debt restructuring. Notably, none of the latter paid dividends throughout the sample period. Put differently, none of the non-DFUR firms that paid dividends needed debt restructuring. This result is consistent with the payment of dividends based on realized earnings signaling a firm's financial solidity. Nevertheless, this result does not seem to hold when the dividends are based on unrealized earnings.

Multivariate survival analyses using a relative hazard model (Cox 1972) demonstrate a direct and positive association between DFUR and default risk. Specifically, the evidence shows that, ceteris paribus, the probability of requiring debt restructuring is four times higher for a DFUR firm, compared to a non-DFUR firm. This result is robust to controlling for confounding factors, such as intensified management agency conflicts, compromised corporate governance, or both. In the analyses, we address the possibility of endogeneity resulting from firms with a greater likelihood of encountering financial distress choosing to distribute dividends based on unrealized earnings. A firm facing financial distress may be more likely to distribute cash as dividends originating from unrealized gains, because any payments of dividends can be unauthorized once the distress is made public.[8] We address self-selection concerns using a propensity-score matching procedure as well as a two-stage regression analysis. Our findings are robust to controlling for a firm's propensity to pay dividends based on unrealized earnings.

The results of the survival analysis reveal that the distribution of unrealized earnings does not signal a firm's solidity or the diligent use of its resources by the management. Rather, it leaves the firm with insufficient resources and a greater probability of a looming default. This result is consistent with the wealth redistribution hypothesis and theories emphasizing frictions in the availability of external capital (e.g., Myers and Majluf 1984). Nevertheless, an analysis of the cost of debt suggests that the documented increase in the default risk of DFUR firms is *not* priced into these firms' cost of debt. We find that, after partialling out the impact of various variables documented previously as potentially affecting a firm's financial risk (including the extent of the dividend payment) and controlling for possible endogeneity effects, the cost of debt for a DFUR firm is generally insignificantly different from the cost of debt for a non-DFUR firm. This result implies that the distribution of unrealized earnings *falsely* signals financial solidity to the market. Specifically, it appears that a bold disbursement of cash, based on paper profits, sends false information that these earnings are safer, resulting in the increased default risk being mispriced. Our findings are robust to using different

[8] Corporate laws worldwide by and large require dividend payments to be conditional on the firm's ability to repay all of its liabilities.

proxies for the pricing of risk in the markets, including bond yield spreads and bond ratings as measures of the cost of debt and a Merton-type model (Merton 1974) of the expected default frequency of the company (based on data from the equity market).[9] Furthermore, an event-study analysis around dividend announcements of DFUR and non-DFUR firms shows that there is no difference in abnormal bond returns in the two types of firms, thereby establishing further the misperception of the market about the riskiness of these payouts.[10]

We conducted various robustness tests and sensitivity analyses, including using an alternative version of the DFUR variable and examining the generalizability of our results to different industries and different states of the economy. The findings substantiate the robustness of the main results.

The evidence presented is relevant to many IFRS-adopting countries where the corporate law that allows a firm to distribute dividends from its retained accounting earnings does not distinguish between realized and unrealized earnings. In most European Union (EU) member states the IFRS amounts do not have to be modified to determine distributable profits.[11] This is also the case in a number of IFRS-adopting countries outside the EU, such as Canada, Australia, New Zealand, and Israel. Of note, in the United States, unrealized earnings arising from fair valuations of financial instruments in financial institutions can be distributed as dividends in accordance with US corporate law, because these earnings are taxable. Hence our results may be of interest to regulators, accounting standard setters, rating agencies, shareholders, debtholders, and other stakeholders in most IFRS-adopting countries and, in the case of financial institutions, also in the United States.

The remainder of the paper is organized as follows. The next section reviews the literature and develops our hypotheses. Section 3 describes our data and outlines the procedure for identifying firms that distributed dividends based on unrealized earnings. Section 4 presents our tests and results. Section 5 provides robustness tests and sensitivity analyses. Section 6 concludes.

2 Literature review and development of the hypotheses

2.1 Dividend payout policy

The dividend literature suggests that firms seek to smooth their dividend payments and maintain a relatively stable dividend payout (e.g., Lintner 1956; Shevlin 1982; DeAngelo et al. 1992; Daniel et al. 2008). In their study of payout policy in the twenty-first century, Brav et al. (2005) report that managers will go to great lengths,

[9] There is consistent evidence of the increased default risk being mispriced according to the bond ratings and expected default frequencies (EDF) of the firms. Bond yield spreads provide some evidence of investors in the bond market possibly reacting (at least to some extent) to the distribution of risky dividends originating from unrealized gains, but (unlike in the case of the bond ratings and EDF results) these findings do not hold when we limit the analysis to firms with an ex ante similar inclination to pay such risky dividends.

[10] The abnormal *stock* returns around the dividend announcements of DFUR versus non-DFUR firms are also insignificantly different.

[11] E.g., KPMG Feasibility Study of Capital Maintenance: Main Report. http://ec.europa.eu/internal_market/company/docs/capital/feasbility/study_en.pdf

including selling assets, laying off employees, raising external financing, and skipping profitable projects, to avoid dividend cuts. Notably, dividend studies by and large focus on the *extent* of firms' dividend payouts, typically captured by the amount of total cash dividend payments scaled by earnings (or by total assets). However, the source of the dividends—specifically, which types of earnings underlie the payment—has been overlooked thus far. In particular, to the best of our knowledge, the literature to date has not dealt with the potential repercussions of dividend payouts originating from unrealized earnings.

In line with arguments that companies aim to maintain a smooth dividend payout policy and avoid dividend cuts at almost any cost, following the adoption of fair value accounting, firms may be inclined to distribute earnings, even before they are realized, if no specific law prohibits it. Since fair value accounting allows firms to recognize unrealized revaluation earnings that they were prohibited from including in their income statements by the previous accounting rules, firms' recognized earnings may grow—in the case of revaluation gains—or decline—in the case of revaluation losses—following the implementation of the new rules, all other things being equal. If total earnings increase, due to the recognition of revaluation gains, cash dividends need to increase as well if firms want to avoid a reduction in the payout-to-earnings ratio. Moreover, an increase in dividend payments may signal *safer* future profits (Michaely et al. 2018). Such a signal should be particularly important for firms that recognize unrealized gains, because it can assuage investors' concerns about these uncertain earnings. The one study that accounts for the effect of the presence of fair value items on a firm's dividend policy documents increases in the amount of dividend payments directly associated with the recognition of profits that arise from changes in the fair values of these items (Chen and Gavious 2016). Our study advances the examination of this important issue, by exploring the consequences of such payouts not only for the firm but also for its debtholders.

2.2 The consequences of paying dividends

The implications for debtholders of paying dividends are unpredictable. This unpredictability is a function of the opposing hypotheses offered in the dividend literature (the wealth redistribution hypothesis and the information content hypothesis). Likewise, the FCF disbursement-retention tradeoff also leads to an unpredictable effect of dividend payouts. Let us first discuss the implications as per the wealth redistribution and information content hypotheses. According to the former hypothesis, when dividends are paid to shareholders, there is a transfer of wealth from debtholders to shareholders, which increases the riskiness of the outstanding debt. This hypothesis, which stems from the conflict of interests between debtholders and shareholders, predicts that debtholders will price-protect themselves by requiring a higher cost of debt.[12] On the other hand, according to the information content hypothesis, the distribution of dividends conveys information about the firm's ability to generate future cash flows. Specifically, it predicts that dividend payments are followed by greater cash flows, safer cash flows, or both (i.e., less cash flow volatility). As a signal of a firm's

[12] From the debtholders' perspective, the payment of dividends reduces the firm's value, thereby increasing the value of the implicit put option and the probability of default.

financial solidity, the distribution of dividends may also lead to a reduction in the cost of debt. The literature provides inconclusive evidence on the overall implications of the wealth redistribution and information content hypotheses, which implicate different debt-pricing behaviors around dividend distributions. According to Dhillon and Johnson (1994), "although these two hypotheses have different implications for the bond price reaction to dividend changes, they are not mutually exclusive" (p. 281). Thus their implications occur concomitantly and can either outweigh or offset one another.[13] Finally, in line with the FCF disbursement-retention tradeoff, managers face a trade-off between disbursing the firm's FCF to mitigate investor concerns about overinvestment and retaining the FCF for future growth (Hail et al. 2014; Kalay 2014). By reducing the amount of cash available to managers, dividend payments signal that the managers are committed to the diligent use of the firm's resources and will steer clear of superfluous investments and the expropriation of the firm's resources for private benefit (Jensen 1986; Lang and Litzenberger 1989; DeAngelo et al. 2006).[14] Thus, in accordance with the FCF theories of dividends, dividend payments can be used to reduce the agency costs of debt. On the other hand, the disbursement of the firm's internally generated funds as dividends dilutes the firm's cash resources, thereby compelling it to resort to the costlier option of external sources for financing future growth.[15] The greater the dividend payments are, the greater the dilution of the internal funds and hence the greater the potential future cost. The overall effect on the cost of debt is thus unpredictable.

Notably, in our setting of dividends originating from unrealized earnings (DFUR), the opposing effects of the payouts on the firm's debtholders stand in even sharper contrast. On the one hand, the uncertainty with regard to whether unrealized earnings that have been distributed to shareholders will materialize as cash in the future makes it harder for the debtholders to monitor the firm and formulate their expectations for its prospects. In particular, it makes it harder for them to determine an acceptable range of probabilities about the likelihood of a default. Thus, according to the wealth redistribution hypothesis, DFUR firms will exhibit a higher cost of debt compared to non-DFUR firms. Moreover, if the payment of cash is based on uncertain paper profits, the likelihood that the firm will be forced to resort to external financing increases and hence the riskiness of the firm increases, resulting in a higher cost of debt. On the other hand, according to the information content hypothesis, DFUR firms will be less prone to default on their debt because, allegedly, only the most solid firms would indulge their shareholders with cash dividends that rely on paper profits. Furthermore, as a tool for

[13] While Handjinicolaou and Kalay (1984) find evidence consistent with the information content hypothesis, Dhillon and Johnson (1994) present evidence in support of the wealth redistribution hypothesis, which, as they note, "does not rule out the information content hypothesis" (p. 281).

[14] Disbursing cash as dividends can also mitigate minority shareholder concerns about expropriation. Indeed, in countries with good legal protection, minority shareholders can use their legal power to force firms to dispense cash as dividends to reduce the risk of expropriation, particularly if the firms lack alternative value-maximizing uses for their cash reserves (e.g., La Porta et al. 2000; Shleifer and Wolfenzon 2002). On that note, we point out that Israel is a common law country (similar to the United States and the United Kingdom), with effective legal protection of minority shareholders (La Porta et al. 1998) and prevailing concentrated insider holdings of closely held firms (the average insider holdings in our sample are 61%).

[15] According to the pecking-order hypothesis, information asymmetries lead managers to initially prefer internal financing, as it is a cheaper and less risky source of capital. Only if there are insufficient internal funds will the manager resort to the costlier option of external financing (Myers and Majluf 1984).

demonstrating commitment, the payment of dividends based on such earnings sends an even stronger message about managers not overinvesting or expropriating. Hence the required cost of debt of a DFUR firm will be lower than the required cost of debt of a similar non-DFUR firm, all else equal.

All in all, the payment of DFUR leads to unpredictable effects on a firm's default risk and its cost of debt. Accordingly, we formulate the following null hypotheses.

Hypothesis 1. A firm that distributes dividends based on unrealized earnings does not differ in the likelihood of defaulting on its debt from a firm that does not distribute dividends based on unrealized earnings, all else equal.
Hypothesis 2. A firm that distributes dividends based on unrealized earnings does not differ in its cost of debt from a firm that does not distribute dividends based on unrealized earnings, all else equal.

3 Sample selection and data

3.1 Sample selection

Our sample selection procedure begins with all 623 Israeli public firms listed on the Tel Aviv Stock Exchange from 2007 until 2013.[16] We excluded financial firms from the analyses, because they were not required to adopt IFRS. This resulted in the elimination of 29 of the 623 companies. Additionally, we excluded another 41 companies, because they were dually listed on the Tel Aviv and US stock exchanges. Therefore they were fully compliant with US GAAP and not required to adopt IFRS.[17] Finally, we excluded firms for which data were missing as well as firms with no tradable debt (bonds).[18] This resulted in the elimination of 261 firms. Thus our final sample consists of 292 firms. The sample selection procedure is presented in Table 1. We supplement the post-IFRS dataset with information about the firms in the pre-IFRS period of 2004–2006. Overall, our sample consists of 2652 observations: 876 pre-IFRS and 1776 post-IFRS firm-years. In the analyses, we deal with outliers by winsorizing extreme values (top and bottom 1%) of continuous variables. We winsorize, rather than cut the extreme values, to conserve data.

3.2 Data

We obtained the financial information for our sample from the Bloomberg Professional database. We supplemented this data with information collected manually from the

[16] Though IFRS was formally adopted in 2008, almost all Israeli public firms had already voluntarily adopted IFRS in 2007.
[17] Recall that the US GAAP rule that allows the measurement of financial instruments only at fair value affects mainly financial firms, particularly in terms of the ability to recognize unrealized revaluation earnings. Neither of our GAAP-reporting firms is a financial firm. Therefore neither one is significantly affected by fair value accounting rules. (US GAAP-reporting firms in Israel are by and large high-technology firms.)
[18] Firms with no tradable debt are excluded from the sample, because there is no documentation about whether they defaulted on their (nonpublic) debt.

Table 1 Sample selection procedure

Israeli public companies listed on the Tel Aviv Stock Exchange during the sample period	623
Excluding financial firms	29
Excluding dually listed firms not required to adopt IFRS	41
Excluding firms with no tradable debt, insufficient information for the analyses, or both	261
Final firm sample	292

firms' financial statements as well as from the Bank of Israel. The manually collected data include unrealized earnings that arise from the fair value measurement of financial instruments, investment property, investment in subsidiaries, and investment in associates and joint ventures, as per IFRS rules.[19] To obtain information about defaults, we gained access to the Bank of Israel's corporate default database.[20] The firms included in this database are those that issued bonds in the past (straight or convertible bonds or both) and subsequently entered a debt restructuring.[21] Of the 292 firms in our sample, 94 firms restructured debt at least once during the sample period. Specifically, 82 firms restructured debt once, 11 firms did so twice, and one firm did so three times. Fig. 1 depicts the occurrences of debt restructuring by year.

We also used the Bank of Israel's calculations for corporate bond spreads. In line with prior studies (e.g., Fenn 2000; Shi 2003; Chaplinsky and Ramchand 2004), we used the basis point spread between the company bonds' (market value) weighted yield and government bonds with comparable duration and indexation characteristics to proxy for a firm's cost of debt. We also obtained the firms' bond ratings, an alternative proxy for the cost of debt (e.g., Ziebart and Reiter 1992; Shi 2003; Amir et al. 2010), from the Bank of Israel. Generally, a bond is rated by one of the two rating agencies active in Israel: Maalot (a fully owned subsidiary of Standard & Poor's) and Midroog, a partially owned (51%) subsidiary of Moody's. In cases where a bond was rated by both agencies in the same year, we averaged the ratings to get the average firm-year rating. The same inferences were obtained if, instead of using the average, we took the most recent rating of the two. If the firm had several series of bonds, we determined its rating by the market-value weighted average of the ratings of the different bonds. The results were similar if we used the rating of the lowest rated bond of each firm, instead of the weighted average. The number of firm-years with rating data in our sample is 547. As a third proxy for the price of risk, we obtained a market-based measure of the expected

[19] Appendix A outlines the identification and measurement of unrealized revaluation earnings (including quantitative information about the earnings in our sample) in accordance with the relevant international standards.

[20] As of 2008, the Bank of Israel began recording all of the public debt restructurings in Israel. Note that the one-year gap between the initial adoption of IFRS in Israel (effective December 31, 2007) and the beginning of the recording of debt restructurings by the Bank of Israel (January 1, 2008) does not harm our analyses, because the consequences of distributing dividends, based on the new rules, would not have appeared prior to 2008.

[21] A firm enters a debt restructuring when 1) it announces to its bondholders that it cannot pay its debt as outlined in the terms of the bond; and/or 2) the firm has not paid the debt, as per the terms of the bond; and/or 3) a court determines that the firm will not be able to repay its bondholders, as per the terms of the bond. The date of entering a debt restructuring is the date of whichever one of the above three events occurs first.

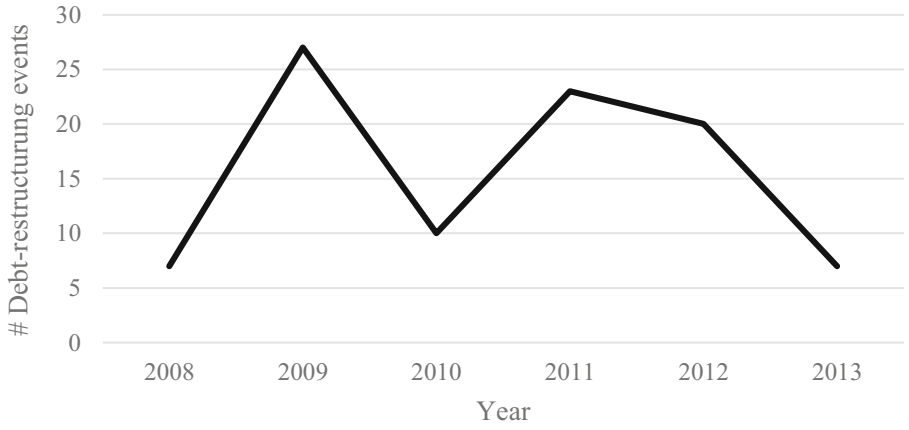


Fig. 1 Debt-restructuring events by year

default frequency of a firm from Moody's KMV database.[22] This measure is based on Merton's (1974) model for pricing corporate debt. Specifically, the expected default frequency measures the likelihood that a firm will declare bankruptcy within one year through application of the Merton model (see also Hillegeist et al. 2004; Vassalou and Xing 2004).

3.3 Identifying DFUR firms

We conducted our analyses using a procedure proposed by Chen and Gavious (2016) to identify DFUR firms.[23] According to this procedure, a firm is so classified only if it has paid dividends in amounts that exceed all of its distributable *realized* earnings. Thus the assumption underlying the classification is that all realized earnings are distributed before any unrealized earnings are distributed. The procedure is as follows.

a. Identify the firm-years in which dividends were distributed to shareholders.
b. For each firm-year, classify net income into "realized" and "unrealized" categories.
c. Then, for each firm-year, identify the firm's accumulated realized earnings not distributed thus far.
d. Compare the amount of dividends distributed in each year with the distributing firm's accumulated realized earnings not distributed thus far.
e. If the amount of dividends paid is greater than these earnings, infer that the excessive dividends were distributed based on unrealized earnings. Otherwise, infer that the firm did not distribute dividends based on unrealized earnings.

Based on the procedure described above, 75 firms (26%) in our sample distributed dividends based on unrealized gains at least once during the sample period. On average, each of these 75 DFUR firms paid dividends based on unrealized gains two to three times (2.49) during the sample's six-year period. Of these DFUR firms, 29 (39%)

[22] The methodology of calculation by Moody's KMV is described by Crosbie and Bohn (2003).
[23] Appendix B provides a detailed example of the identification of a specific firm in our sample as DFUR/non-DFUR throughout the sample period.

encountered financial distress and entered a debt restructuring, usually two to three years after the payment of dividends based on unrealized earnings. (Twenty-five DFUR firms entered a debt restructuring once, and four did so twice.) Note that two-year lagged DFUR makes the greatest contribution to the explanation of undergoing debt restructuring, followed by three-year lagged DFUR. In other words, DFUR is more likely to lead to debt restructuring two or three years after payment of dividends based on unrealized earnings than one year after. This finding suggests that firms on the verge of default are reluctant to distribute dividends based on unrealized earnings, perhaps for fear of legal action. Note, too, that none of the DFUR firms underwent debt restructuring before the first payment of dividends from their unrealized earnings. In contrast, none of the non-DFUR firms that paid dividends ever required debt restructuring throughout the sample period. We point out that the 65 non-DFUR firms that did need debt restructuring never paid dividends throughout the sample period. Hence, in contrast to the DFUR firms, the financial distress of the non-DFUR defaulting firms can be associated neither with dividend distribution in general nor with dividend distribution based on unrealized earnings in particular.[24]

We categorized a firm as DFUR from the first year it paid dividends based on unrealized earnings and onward. In other words, for each firm, the indicator variable DFUR takes a value of 1 in the year the firm first distributed dividends based on unrealized earnings *and retains that value up until the last sample year*. This yields 457 (1319) (non-)DFUR firm-year observations. For robustness we repeated the analyses where, instead of coding a firm as DFUR from the year it first distributed dividends based on unrealized earnings and onward, we coded it as DFUR for the entire sample period (even before the first payment from unrealized earnings). In addition, we repeated the analyses using a *firm-year-based* coding rather than a *firm-based* coding of DFUR. In other words, DFUR takes a value of 1 only for the firm-years in which dividends were distributed based on unrealized earnings. Thus, whereas a firm-based coding of DFUR focuses on the characteristics of the firms that tend to use the recognition of unrealized earnings to increase dividend payments, a firm-year-based coding of DFUR focuses on the incidence of dividend payments out of unrealized earnings. Importantly, our results are robust to using any of these three approaches to defining a firm as DFUR (i.e., doing so from the first year it began paying dividends based on unrealized earnings and onward, only in payment years, or in all years of the sample period).

Table 2, Panel A, displays the industry affiliation of our sample firms by DFUR versus non-DFUR companies as well as by whether the firm entered a debt restructuring during the sample period. The results show that real estate firms are the most common DFUR companies and also constitute the highest percentage of debt-restructuring firms (63% and 61%, respectively). By contrast, high-technology firms are the least common in both groups (3% and 2%, respectively). A possible explanation for the prevalence of real estate firms in the DFUR group is that IAS 40 *Investment Property*, which allows the recognition of unrealized earnings that arise from revaluations of land and buildings, is relevant to these firms in particular. Given their broad exposure to land and buildings, many of which are reported at fair

[24] The results of our study are robust to excluding firms that never paid dividends throughout the sample period.

Table 2 Summary statistics

Panel A. Industry affiliation by DFUR and by default

	No. of firms (%)				
	Pooled	**DFUR firms**	**Non-DFUR firms**	**Firms that needed debt restructuring**	**Firms not needing debt restructuring**
Final firm sample	292 (100%)	75 (100%)	217 (100%)	94 (100%)	198 (100%)
By industry affiliation:					
Real estate	134 (46%)	47 (63%)	87 (40%)	57 (61%)	77 (39%)
High-technology	20 (6%)	2 (3%)	18 (8%)	2 (2%)	18 (9%)
Technology-other	58 (20%)	11 (14%)	47 (22%)	12 (13%)	46 (23%)
Commerce and services	55 (19%)	11 (15%)	44 (20%)	16 (17%)	39 (20%)
Investment holding	25 (9%)	4 (5%)	21 (10%)	7 (7%)	18 (9%)

Panel B. Descriptive statistics

	DFUR firms			**Non-DFUR firms**		
Variable	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Total assets ($ millions)	1634	383	3254	861***	126***	2117
ROA_Realized	0.05	0.03	0.25	0.04	0.03	0.21
Unrealized ROA-Total	0.09	0.02	0.67	0.00***	0.00***	0.29
Unrealized ROA from revaluation of:						
Financial instruments	0.02	0.01	0.05	0.00**	0.00**	0.06
Investment property	0.04	0.01	0.25	−0.00***	0.00***	0.12
Investment in other entities	0.03	0.01	0.77	0.00*	0.00*	0.17
Dividend /total earnings	0.52	0.21	0.77	0.26***	0.08***	0.66
Dividend /realized earnings	1.34	1.17	1.46	0.32***	0.12***	0.72
Current ratio	1.38	1.12	1.95	1.73***	1.24***	2.78
Interest coverage	2.25	0.65	22.64	2.59	0.79*	23.70
Leverage	0.83	0.82	0.22	0.80***	0.79***	0.26
Altman's Z-score	0.69	0.66	1.50	0.93**	0.93***	3.49
EDF	0.09	0.03	0.12	0.06***	0.02***	0.10
Yield spread	0.22	0.05	0.43	0.19	0.06	0.33
Rating	7.60	7.00	3.32	6.69	6.00	2.86

This table presents the industry affiliation (in Panel A) and the descriptive statistics (in Panel B) for our sample of 292 Israeli firms during the post-IFRS period of 2007–2013 (1776 firm-years). The variable definitions are found in Appendix C. Of the 292 firms, 75 firms distributed dividends based on unrealized earnings (DFUR) at least once during the post-IFRS period, and 217 firms never did so (in all, 457 DFUR and 1319 non-DFUR firm-years). Of the DFUR firms, 29 restructured debt at least once (33 occurrences), following the distribution of dividends based on unrealized earnings, whereas none of the non-DFUR firms that distributed dividends did so (the 65 non-DFUR firms that did require debt restructuring did not pay dividends throughout the sample period). Asterisks in Panel B indicate that the value for non-DFUR firms is significantly different from the corresponding value for DFUR firms. ***, **, and * denote significance at the 1%, 5%, and 10% (two-tailed) levels, respectively

value, real estate firms' financial reporting is strongly affected by IAS 40.[25] Nevertheless, it should be noted that real estate DFUR firms have an incidence of debt restructuring similar to that of DFUR firms in other industries (about 40%). Thus our results should be generalizable to all industries. Indeed, when we repeated all of our analyses excluding real estate firms, the inferences remained unchanged (see Section 5). In other words, the results for the pooled sample are not driven solely by the real estate firms.

4 Tests and results

4.1 Univariate analyses

Table 2, Panel B, presents the descriptive statistics of selected financial information for the DFUR and non-DFUR firms in our sample separately. All of the variables are defined in Appendix C. Importantly, both the DFUR and non-DFUR sample firms operate in the same legal and economic environments, two major factors essential for comparing these two groups in the context of our study. Comparison of the two groups shows that DFUR firms are significantly larger than non-DFUR firms (mean total assets of $1634 million versus $861 million, respectively). Realized earnings are similar in both types of firms (4% to 5% of total assets, on average), whereas unrealized earnings are significantly higher in DFUR firms (9% of total assets, on average, versus zero in non-DFUR firms; p value <0.01).[26] Notably, the finding of positive (zero) average and median unrealized earnings in (non-)DFUR firms implies that firms by and large pay dividends based on unrealized earnings when the latter are positive. Fig. 2 depicts the dividend payout ratios of DFUR versus non-DFUR firms. The dividend payout ratio, taken from *total* earnings, is indeed significantly higher in DFUR firms (52% compared with 26% in non-DFUR firms; p value <0.01). When the dividend payout ratio is taken from *realized* earnings only, the gap between DFUR firms and non-DFUR firms is even more pronounced (134% and 32%, respectively). The over 100% dividend payout ratio from realized earnings in DFUR firms reflects the fact that the firms distributed all of their realized earnings and then some, based on unrealized earnings, consistent with our DFUR definition. Note that, for (non-)DFUR firms, the dividend payout ratio from *total* earnings is (in)significantly higher than the dividend payout ratio from *realized* earnings only. When we compare the dividend payout ratios of the two groups of firms prior to IFRS adoption (untabulated for parsimony), we find no difference (about 34% on average for both groups). Notably, while DFUR firms significantly increased their dividend payout ratios, compared to the levels that existed in the pre-IFRS period (at the 1% significance level), the non-DFUR firms had similar dividend payout ratios in both subperiods. Moreover, the increase in the DFUR firms' dividend payout ratio is so marked—from 34% to 134% of realized earnings on average—that it signals an obvious change in the dividend policy of these

[25] We point out that prior to the adoption of IFRS, real-estate firms, like other firms, did not revalue their holdings but reported them at cost.

[26] On average, unrealized earnings in DFUR firms are almost two times larger than realized earnings (9% versus 5%; p value <0.01).

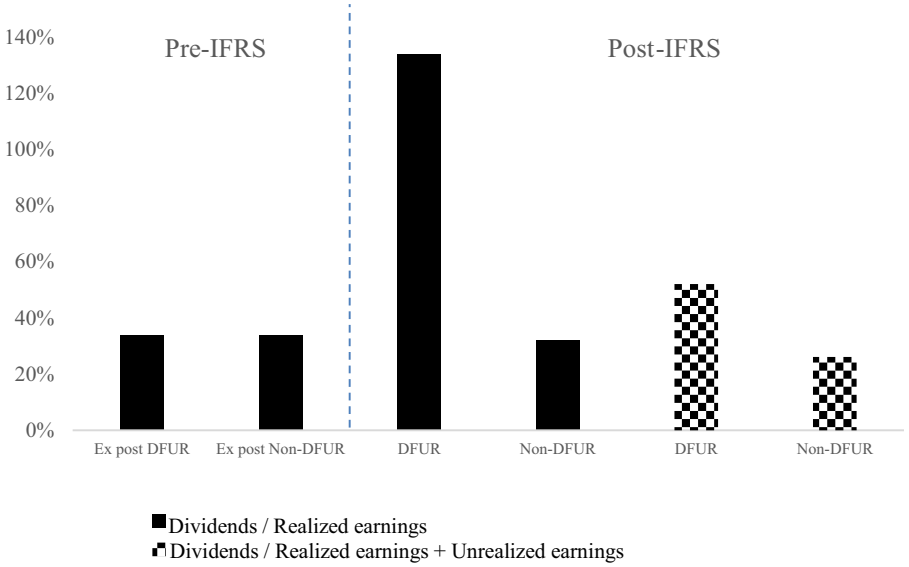


Fig. 2 Dividend payout ratios across DFUR and non-DFUR firms. This figure depicts the dividend payout ratios of DFUR versus non-DFUR firms in the pre- versus post-IFRS periods. The blackened columns represent the dividend payout ratio, taken from realized earnings only (dividends / realized earnings), whereas the plaid columns represent the dividend payout ratio taken from *realized plus unrealized* earnings [dividends / (realized earnings + unrealized earnings)]. Since unrealized earnings became relevant in the post-IFRS period, the ratio dividends / realized earnings + unrealized earnings is displayed for this period only

firms.[27] Taken together, the above findings provide supporting evidence that the classification of DFUR versus non-DFUR among our sample firms is correct.

Liquidity, proxied either by the current ratio or interest coverage, is lower in DFUR firms. These firms also demonstrate greater financial risk, as evident in their significantly higher leverage and lower Altman Z-scores.[28] Consistent with these differences, the expected default frequencies of DFUR firms are significantly higher than those of non-DFUR firms. Yet, despite these differences, both the bond yield spreads and bond ratings of DFUR firms are insignificantly different from those of non-DFUR firms.[29] Recall that the former firms have more debt restructurings (Section 3). Untabulated comparisons of bond yield spreads and bond ratings in DFUR versus non-DFUR firms by whether or not they required debt restructuring during the sample period show that, as expected, both are significantly higher for the firms that needed debt restructuring, within both groups. Specifically, on average (median), bond yield spreads are around 40% (27) [6% (4)] in firms that required [did not require] debt restructuring, regardless of whether they are DFUR or non-DFUR. Similar inferences are obtained for bond ratings. However, there is no significant difference between the bond yield spreads and bond ratings of DFUR and

[27] On the face of it, DFUR firms could double or triple their dividend payout ratio using realized earnings alone. Still, this group of firms chose to distribute an amount that exceeds their total realized earnings based on unrealized gains recognized. While this study examines the repercussions of such behavior for the firm, an investigation of the behavioral aspects of DFUR is beyond its scope.

[28] We use Z-scores based on Altman et al. (1998). Our results are robust to using either Z-scores based on Altman (1968) or Z-scores adjusted for Israeli companies (Ingbar 1994).

[29] In specifying *Rating* as a continuous variable, we converted Maalot's and Midroog's rating symbols to an ordinal scale by assigning a value of 1 to the highest rating, 2 to the second-highest rating, etc.

non-DFUR firms within the firms that required debt restructuring or within those that never did. These findings are important because they suggest that the insignificant differences in these proxies for the cost of debt of DFUR and non-DFUR firms are not driven by the market acting inefficiently in general; rather, the market does distinguish between riskier and safer firms, as proved by the eventual outcome of requiring versus not requiring debt restructuring, respectively. We examine this conjecture further later on.

Overall, the results of the univariate analyses support the hypothesis that DFUR firms are more likely than non-DFUR firms to encounter financial distress and default on their debt. Nevertheless, there is no evidence of a higher cost of debt for DFUR firms, according to the yield spreads and the ratings of their bonds. In what follows, we supplement the univariate analysis with a set of multivariate analyses, estimating the *direct* association of DFUR with the firm's probability of defaulting on its debt as well as with its cost of debt.

4.2 Multivariate analyses

4.2.1 Default regressions

We examine the association between DFUR and default risk in the period following the adoption of IFRS, using a Cox proportional hazard model (Cox 1972).[30] In this model, the hazard is assumed to be:

$$h_i[t|X_i(t)] = h_0(t)\exp[\alpha X_i(t)], \quad (1)$$

where $h_0(t)$ is the baseline hazard at time t, i.e., the risk of debt restructuring, given that all of the firm characteristics at time t equal 0. Note that this hazard function accounts for the time spent by firms (number of years) up until when they enter a debt restructuring.[31] α is a vector of parameters to be estimated. X is a vector of firm variables at time t affecting the firm's risk of default. Specifically, in our main specification, X is a vector of:

{DFUR, DivPayout, Size, Tangibility, ROA_Real, Loss_Real, ROA_Unreal, Loss_Unreal, Leverage, InterestCoverage, CurrentRatio, Maturity, EarnSD, ReturnSD}.[32]

[30] A survival analysis using hazard models obviates the shortcomings of static risk models and enables the estimation of the effect of several explanatory variables on a firm's likelihood of defaulting on its debt during the estimation period (Shumway 2001; Campbell et al. 2008). Most studies examining the variables affecting financial distress have estimated single-period static models, although the information used is usually multiple-period data about financial distress (bankruptcy, filing for Chapter 11, etc.). As Shumway (2001) explains, by ignoring the fact that firms change over time, static models produce biased and inconsistent estimates. Survival analysis using hazard models solves the problems of static models by accounting explicitly for time.

[31] Observations of firm-years for which a default has already occurred during the sample period are excluded from the analysis (in all, a redundancy of 174 post-default firm-years). In other words, a firm leaves the sample when it first enters a debt restructuring. If a firm enters a restructuring more than once during the sample period, the count of years is up until the first restructuring event.

[32] We also examined specifications with capital expenditures as a proxy for the firm's investment strategy. In principle, firms may invest in assets in the post-IFRS period merely for the sake of recognizing unrealized holding gains. Such improper investments can boost both unrealized earnings (and hence dividends) and default risk. In our sample, however, the levels of a firm's (average and median) capital expenditures decreased in the post-IFRS period for both DFUR and non-DFUR firms (untabulated for parsimony). Moreover, we find that capital expenditures do not incrementally contribute to the explanation of default risk over and above the risk determinants included in model 1.

DFUR is our indicator variable for a firm that distributed dividends based on its unrealized earnings. *DivPayout* is cash dividend payouts divided by total earnings.[33] The coefficient on *DFUR* captures the difference between DFUR and non-DFUR firms in the likelihood of a default, while the coefficient on *DivPayout* captures the impact of the *extent* of dividends (originating from either realized or unrealized earnings) paid, after controlling for the DFUR classification.[34] *Size* is the natural logarithm of total assets, and *Tangibility* is the proportion of fixed assets to total assets; both variables proxy for information asymmetries (e.g., Hadlock and James 2002; Denis and Mihov 2003; Bharath et al. 2008; Riedl and Serafeim 2011). *ROA* is the firm's return on assets, measured as net income divided by total assets. We allow for different coefficients on realized and unrealized earnings by including realized earnings divided by total assets (*ROA_Real*) and unrealized earnings divided by total assets (*ROA_Unreal*) in the regressions.[35] Consistent with Dichev and Skinner (2002), we also include loss indicators. *Loss_Real* (*Unreal*) equals 1 if *ROA_Real* (*Unreal*) is negative and 0 otherwise. *Maturity* is the weighted average of the duration of all of the firm's traded bonds. *EarnSD* is the standard deviation of annual net income over the last five years (year t-4 through year t), and *ReturnSD* is the standard deviation of daily stock returns over the last year (year t). These variables capture earnings and returns volatility, respectively. *Leverage* is the ratio of total debt to total assets. *Interest Coverage* is the ratio of operating profits to interest expense and *Current Ratio* is current assets divided by current liabilities.[36,37] In our regressions we control for industry fixed effects. (Controlling for year fixed effects is redundant in a Cox proportional hazard model, which, by its very construction, accounts for time via the dependent variable.) A firm's risk of defaulting on its debt and requiring debt restructuring is expected to increase with the amount of its leverage as well as with the degree of its earnings and returns volatility and decrease with its size, tangibility, profitability, liquidity (proxied by interest coverage and current ratio), and bond maturity. Note that the Cox model provides estimates of the parameters' vector α but provides no direct estimate of the baseline hazard $h_0(t)$.

The estimation results of the survival model are displayed in Table 3, column (1). As the highly significant positive coefficient on the *DFUR* indicator variable indicates, DFUR firms are more likely to need debt restructuring. We point out that the inclusion of the *DFUR* variable improves the model's explanatory power substantially. The pseudo R^2 of the model increases by about 50% when *DFUR* is added to the specification. In terms of the hazard ratio, the coefficient on *DFUR* in column (1) is

[33] We repeated the analyses using cash dividend payments divided by *realized* earnings only. This ratio is interesting because it captures the excess dividend payments better, if any took place, given the firm's level of realized earnings. Results are robust to using either the dividend payout ratio from total earnings or from realized earnings only. Nevertheless, we use cash dividend payments divided by *total* earnings as our primary measure to ensure that our results are not driven by changes in the dividend payout ratio. We thank an anonymous referee for suggesting this clarification.

[34] Since none of the non-DFUR firms that paid dividends in the post-IFRS period required debt restructuring during the sample period, the inclusion of an interaction variable between *DFUR* and *DivPayout* is technically impossible.

[35] We do not predict whether the association between earnings and the probability of a default differs for realized and unrealized earnings.

[36] We also use alternative proxies for liquidity: the firm's cash position and operating cash flows. Neither of these proxies performs better than the current ratio variable commonly used in financial-distress and cost-of-debt models. The main results remain unchanged when we replace the current ratio with either or both of these variables.

[37] All of the variables in model 1 appear in Appendix C together with their definitions.

Table 3 Default regressions

	(1)	(2)
DFUR	1.410***	1.500***
	(0.394)	(0.425)
DivPayout	−0.184	−0.166
	(0.295)	(0.283)
Size	−1.201***	−1.200**
	(0.441)	(0.472)
Tangibility	−0.890	−1.128
	(1.113)	(1.116)
ROA_Real	−2.829***	−2.965***
	(1.068)	(1.074)
Loss_Real	1.431**	1.378**
	(0.586)	(0.580)
ROA_Unreal	−5.247*	−5.494*
	(2.869)	(2.851)
Loss_Unreal	−0.856	−0.933
	(0.640)	(0.602)
Leverage	0.143	0.121
	(0.187)	(0.198)
InterestCoverage	−0.006	−0.007
	(0.004)	(0.005)
CurrentRatio	−0.557***	−0.614***
	(0.144)	(0.155)
Maturity	−0.470***	−0.496***
	(0.160)	(0.162)
ReturnSD	11.020	12.330
	(7.747)	(7.625)
EarnSD	0.025***	0.026***
	(0.008)	(0.008)
OwnerConc		−0.007
		(0.022)
OwnerConc_sq		−0.000
		(0.000)
B_Group		−0.028
		(0.369)
CSR		−1.006
		(0.617)
Industry	Yes	Yes
Pseudo R^2	0.241	0.246
Likelihood ratio chi-squared	1547.8	1438.6
	(p value <0.000)	(p value <0.000)
No. Obs.	898	898

Table 3 presents the estimation results of a survival analysis, using a Cox proportional hazard model (Cox 1972). In column 2, we repeat the analysis, including proxies for management agency conflicts and corporate governance quality. All of the variables are defined in Appendix C. Industry is a dummy variable, capturing the industry's fixed effects. Entries are coefficients; standard errors clustered at the firm level appear in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% (two-tailed) levels, respectively

4.095. The coefficient on *DFUR* in terms of the hazard ratio allows us to interpret the results of the survival analysis in economic terms: the probability of a DFUR firm requiring debt restructuring is about four times higher than that of a similar non-DFUR firm, all else equal.

The coefficient on *DivPayout* is insignificantly negative. A negative coefficient on dividend payouts is consistent with dividend payments signaling a firm's financial solidity. Importantly, an insignificant negative coefficient on *DivPayout*, together with a significant positive coefficient on *DFUR*, indicates that, rather than the extent of the dividend payouts, it is the source of the dividends (realized versus unrealized profits) that affects the chances of a future default. *Size*, *ROA* (both realized and unrealized), *Current Ratio*, and bond *Maturity* are, as expected, significantly and negatively associated with a firm's likelihood of encountering financial distress and requiring debt restructuring.[38] The coefficients on *Loss_Real* and *EarnSD* are significantly positive, as expected.

We also run a specification using Altman's Z-score measure interchangeably with the accounting variables in the vector X. Altman's Z-score is supposed to summarize all of the relevant accounting data for the prediction of defaults. We thus replace the vector X with a vector X* of:

{DFUR, DivPayout, Size, Zscore, Maturity, EarnSD, ReturnSD}.

Untabulated results show that the coefficient on Altman's Z-score measure (*Zscore*) is significantly negative, consistent with lower Z-scores predicting a greater likelihood of looming financial distress. The coefficient on *DFUR* is positive and highly significant (1.390; p value = 0.000). In terms of the hazard ratio, the coefficient on *DFUR* is 4.016, similar to the result obtained for the main specification (with the explanatory variables in X). The coefficients on all the other explanatory variables are also consistent with those in the main model.

Furthermore, in an additional analysis, we account for the possibility that DFUR firms have more management agency conflicts and impaired corporate governance that might affect their decision to unduly increase their dividend payments. To that end, we supplement our survival model with factors expected to have a significant effect on agency problems and the firm's corporate governance. Specifically, we include the ownership concentration[39] and ownership concentration squared[40] (*OwnerConc* and *OwnerConc_sq*, respectively), an indicator of the firm's business group affiliation[41]

[38] Interestingly, leverage does not contribute significantly to the explanation of the likelihood of a firm needing debt restructuring, beyond the impact of distributing dividends based on unrealized earnings, size, profitability, liquidity, earnings volatility, or bond maturity. The coefficient on *Leverage* in the default regressions remains insignificant, even if we exclude the other accounting items from the equation. Nevertheless, the coefficient on *DFUR* remains strongly significant and positive in all specifications. Note that in the cost-of-debt regressions presented later on, leverage is priced by rating agencies as well as by investors in the market, as reflected in significantly positive associations of leverage with bond ratings, yield spreads, and expected default frequencies.

[39] Ownership concentration may have a significant effect on corporate governance by either mitigating agency problems (e.g., block holders may have greater incentive and power to monitor management; Shleifer and Vishny 1986) or exacerbating them (e.g., via expropriation of minority shareholders' wealth; Shleifer and Vishny 1997). Thus the association between ownership concentration and DFUR is unpredictable.

[40] Allowing for a nonlinear relationship is in accordance with Morck et al. (1988).

[41] The discrepancy between ownership and control rights—a main feature of business groups—may create incentives for control holders to transfer resources from firms where they have fewer rights to firms where they have greater rights. (This transfer of resources is called "tunneling"; Johnson et al. 2000.) Control holders may take advantage of the new rules allowing recognition of unrealized revaluation earnings to increase the payment of dividends by companies situated lower down the pyramid within the business group.

(*B_Group*), and an indicator of the firm's adoption of corporate social responsibility[42] (*CSR*) in the survival analyses. The results, presented in Table 3, column 2, indicate that neither of these variables has an incremental impact on default risk, after we control for DFUR and the other determinants of financial risk. Importantly, the coefficient on *DFUR* (as well as on the other controls) remains qualitatively similar when these variables are included in the model, suggesting that our *DFUR* indicator is not merely standing in for intensified management agency conflicts, and/or compromised corporate governance.

Lastly, our main finding of a direct and positive association between DFUR and the future risk of default gains further support from an analysis that examines the pattern of unrealized earnings over time. Results show (in)significant reversals in positive (negative) unrealized earnings over time. Fig. 3 depicts the occurrences of positive unrealized earnings by year, together with their subsequent reversals. (Note that reversals may occur at any time during the sample period following the year of the unrealized profit's recognition.) Thus paying out these positive unrealized earnings does indeed place the firm and its creditors at greater risk, because these earnings often fail to materialize as cash in the future.[43]

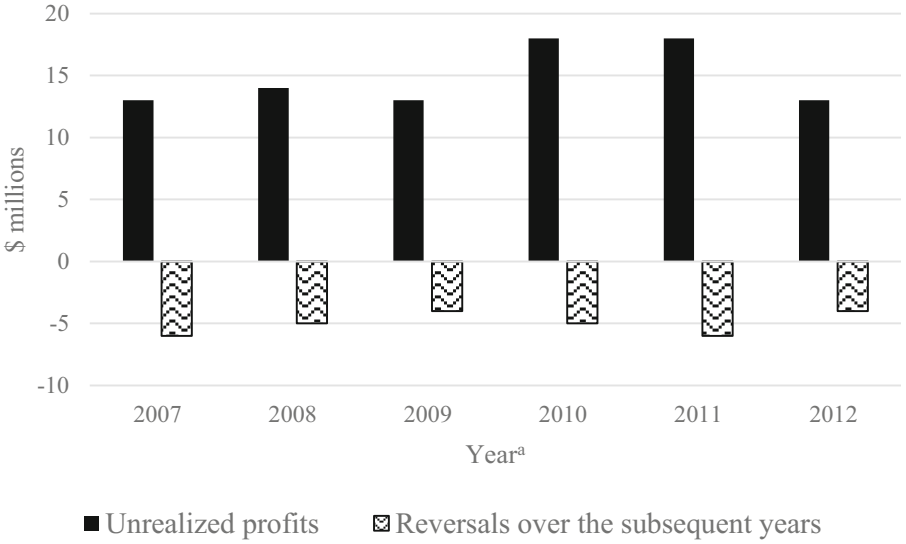
4.2.2 Dealing with endogeneity

In our setting, endogeneity results if firms that are more likely to encounter financial distress choose to distribute dividends based on unrealized earnings. Specifically, a firm with private information that it is likely to face financial distress in the near future that might require debt restructuring could increase its dividend distributions, for example, by distributing its unrealized profits, before this private information is revealed. Corporate laws worldwide generally require dividend payments to be conditional on the firm's ability to pay off all of its liabilities.[44] Thus it would be very difficult to justify the distribution of dividends from unrealized earnings, once the information about a possible need for debt restructuring is made public.

[42] As in the case of ownership concentration, the association between the adoption of a corporate social responsibility (CSR) policy and DFUR is also unpredictable. On the one hand, CSR may signal more management agency conflicts and less effective corporate governance, e.g., if managers choose to engage in CSR activities merely for the sake of building their personal reputations as good citizens (Barnea and Rubin 2010), to reduce the probability of their replacement (Cespa and Cestone 2007), or both. On the other hand, CSR adoption may signal strong, effective corporate governance, requiring managers to act in the best interests of shareholders, inter alia, by using CSR to reduce the conflict of interests between the former and the latter (e.g., Harjoto and Jo 2011). We obtained information about firms adopting a CSR policy from the annual "Maala Ranking of Corporate Social Responsibility" reports for the sample years. The Maala ranking includes categories about business ethics, corporate governance, management, and reporting (as well as community relations, work environment, and environmental protection).
http://maala.org.il/he/company/ranking/faq/Default.aspx?ContentID=168

[43] In an additional analysis, we ran a regression of the survival model's fitted values for the pre- and post-IFRS periods. Recall that we cannot directly estimate the propensity for a default in the pre-IFRS period, because of the lack of information on default occurrences during that time. The coefficient on the *DFUR* indicator is significantly positive, consistent with the results of the original model based on the post-IFRS period. We thank an anonymous referee for suggesting this analysis.

[44] For example, according to Sections 302 and 303 of the Israeli Corporate Law, a firm can pay dividends out of (1) its retained earnings or (2) its earnings accumulated over the last two years, whichever is greater, *conditional on the firm's ability to pay off all of its liabilities*.



[a] Year of recognition of unrealized profits.

Fig. 3 Unrealized profits and subsequent reversals. Figure 3 depicts the occurrences of positive unrealized earnings by year (blackened columns), together with their subsequent reversals (wavy columns). Since reversals may occur at any time following the year of the unrealized profit's recognition, the years on the X axis in the figure, representing the time at which unrealized profits were recognized, extend up until 2012, one year prior to the last sample year (2013) for which we have information about reversals

To deal with potential endogeneity effects, we use propensity-score matching to identify a control group of firms with an ex ante propensity to pay dividends based on unrealized earnings similar to that of our DFUR firms but that did *not* pay dividends based on unrealized earnings throughout the sample period. For the matching procedure, we first estimate a probit model for predicting dividend distributions based on unrealized earnings.

$$DFUR_{\mathrm{i}} = \alpha_o + \alpha_1\, DivPayout_i + \alpha_2\, Leverage_i + \alpha_3\, Size_i + \alpha_4\, ExAnteValueGain_i + \varepsilon_{\mathrm{i}}. \quad (2)$$

We use the data for the three years preceding the massive adoption of IFRS in Israel (2004–2006) in the first-stage probit model estimation.[45] The dependent variable, our *DFUR* indicator, is regressed on a set of variables deemed to affect both financial distress and the decision to pay dividends based on unrealized earnings. Specifically, we include *DivPayout* and *Leverage*, both proxies for debtholder-shareholder conflicts

[45] The estimation of the probit model for predicting DFUR is based on all of the Israeli nonfinancial and nondually listed public companies on the Tel Aviv Stock Exchange and is not restricted to firms with traded bonds. Nevertheless, the results are qualitatively the same when firms with traded bonds only are used. Furthermore, we use the average values (from 2004 to 2006) of the continuous variables in the probit analysis. We also run the probit model using the data for the most recent year prior to IFRS adoption only (2006). All inferences remain unchanged.

over dividend policy (e.g., Ahmed et al. 2002). *Size* is also expected to be positively associated with the likelihood that a firm will pay dividends based on unrealized earnings. *DivPayout*, *Leverage*, and *Size* are as defined above. In the model, we also include a variable that captures a firm's potential ability to exploit fair value accounting to increase dividend payouts following the adoption of IFRS. Specifically, for each firm in our sample, we take the ratio of its asset value in accordance with IFRS to its asset value in accordance with the previous rules[46] *in the year preceding IFRS adoption* (*ExAnteValueGain*).[47] Depending on the classification of the underlying asset, a change in asset value due to the transition from cost to fair value measurement is either recognized as revaluation gains/losses in the income statement or recognized in equity through other comprehensive income. Thus, all else equal, a firm's *ExAnteValueGain*, which captures the extent to which the firm potentially recognizes earnings owing to its transition to IFRS, is expected to be positively associated with *DFUR*.

Table 4, Panel A, provides the results of the DFUR probit model 2. The results indicate that the likelihood that the firm will distribute dividends based on unrealized earnings increases significantly with the size and dividend payouts of the company. In addition, as expected, this likelihood increases significantly with the ex ante value gained from a transition to IFRS.[48,49]

Based on the results of the first-stage probit model, we match each DFUR firm in our sample with a non-DFUR firm with the closest likelihood of distributing dividends based on unrealized earnings, using the Nearest-Neighbor method (Dehejia and Wahba 1999). In the second stage, we estimate our Cox proportional hazard model, using the propensity score-matched subsample. The results presented in Table 4, Panel B, show that *DFUR* is significantly and positively associated with the occurrence of debt restructuring in the propensity score-matched subsample. Hence the increased risk of a default documented for DFUR firms in this subsection is over and above any ex ante differences between DFUR and non-DFUR firms. This result solidifies our conclusion

[46] See footnote 5.

[47] Critically, in the first year of IFRS adoption, firms reported the current as well as the previous year's figures in accordance with IFRS. Thus, for the year preceding the adoption of IFRS, there are two values available: one according to the IFRS rules and one according to the former rules. For example, if a firm first adopted IFRS in 2007, the figures of 2006 appear in the financial statements of 2007 in accordance with IFRS rules (for comparability with the 2007 figures), whereas in the financial statements of 2006, they appear in accordance with the Israeli GAAP rules. The ratio of total assets for 2006 as per IFRS to total assets for 2006 as per the former rules captures the extent to which the firm potentially gains value as a result of the transition to IFRS, all else equal.

[48] As an alternative indicator of a firm's potential ability to exploit fair value accounting to increase dividend payments following the adoption of IFRS, we use an early IFRS adoption indicator (*EarlyAdopt*). In 2006, 45 firms in Israel voluntarily adopted IFRS before all the other public firms did. Hence early adaptors could recognize revaluation gains before other firms could and hence were potentially able to distribute dividends based on these gains before other firms. We find that *EarlyAdopt* is positively associated with *DFUR* (0.480, p value <5%). Importantly, the results of the default and cost-of-debt regressions based on the propensity score-matched sample of firms (see Tables 4 and 5, respectively) are robust to using either *ExAnteValueGain* or *EarlyAdopt* in the DFUR probit model 2. On that note, we point out that our main analyses for the post-IFRS period are robust to either including or excluding the 45 firms in Israel that early adopted the IFRS in 2006.

[49] In an untabulated analysis, we examined whether intensified management agency conflicts, and/or poor corporate governance, are linked to a greater likelihood of the firm distributing dividends based on unrealized earnings. Univariate Pearson and Spearman correlations show that *DFUR* is insignificantly associated with our four controls: *OwnerConc*, *OwnerConc_sq*, *B_Group*, and *CSR*. Additionally, when included in the probit DFUR model, the coefficients on these controls are generally statistically insignificant.

Table 4 Controlling for firms' self-selection to distribute dividends based on unrealized earnings: a propensity-score matching procedure

Panel A. First-stage analysis. Probit DFUR model

Intercept	−4.932*** (1.122)
Size	0.419** (0.175)
DivPayout	0.378* (0.219)
Leverage	−0.713 (0.697)
ExAnteValueGain	3.192*** (0.910)
Industry	Yes
Pseudo R^2	0.174
Likelihood ratio chi squared	44.12 (p value <0.000)
No. Obs.	224

Panel B. Default regressions for the propensity-score matched sample

	(1)	**(2)**
DFUR	2.192*** (0.745)	2.145*** (0.685)
DivPayout	0.079 (0.256)	0.077 (0.254)
Size	−2.072*** (0.575)	−2.214*** (0.615)
Tangibility	−0.179 (2.181)	−0.364 (2.401)
ROA_Real	−12.330*** (2.806)	−12.710*** (2.991)
Loss_Real	−0.733 (1.080)	−0.781 (1.044)
ROA_Unreal	−13.530*** (3.280)	−14.460*** (3.795)
Loss_Unreal	−0.173 (0.945)	−0.351 (0.939)
Leverage	−1.095 (0.914)	−1.241 (1.020)
InterestCoverage	−0.018*** (0.006)	−0.019*** (0.005)
CurrentRatio	−1.285*** (0.398)	−1.414*** (0.482)
Maturity	−0.848** (0.349)	−0.792** (0.333)
ReturnSD	9.789 (20.152)	7.589 (21.948)
EarnSD	0.044*** (0.016)	0.045*** (0.017)

Table 4 (continued)

OwnerConc		−0.014 (0.037)
OwnerConc_sq		0.000 (0.000)
B_Group		−0.192 (0.462)
CSR		−4.800 (3.030)
Industry	Yes	Yes
Pseudo R^2	0.334	0.344
Likelihood ratio chi-squared	4986.0 (p value <0.000)	1450.9 (p value <0.000)
No. Obs.	332	332

Panel A of Table 4 presents the first-stage results for the propensity-score matching, using a probit model. The dependent variable *DFUR* is a dummy variable that equals 1 for a firm that distributed dividends based on its unrealized earnings and 0 otherwise. All of the variables are as defined in Appendix C. Panel B presents the estimation results of the survival analysis for the restricted sample of ex ante similar firms. Entries are coefficients; standard errors appear in parentheses. ***, **, and * indicate significance at the 1%, 5% and 10% (two-tailed) levels, respectively

that it is the payment of dividends based on unrealized earnings, rather than other endogenous factors that triggers the increase in the default risk of DFUR firms.

4.2.3 Cost of debt regressions

To determine the direct association between DFUR and the cost of debt, after partialling out all other factors potentially affecting the cost of debt, we estimate specifications of:

$$\begin{aligned} Cost\ of\ Debt_{i,t+1} = {} & \alpha_o + \alpha_1 DFUR_{it} + \alpha_2 DivPayout_{it} + \alpha_3 Size_{it} + \alpha_4 Tangibility_{it} \\ & + \alpha_5 ROA_Real_{it} + \alpha_6 Loss_Real_{it} + \alpha_7 ROA_Unreal_{it} + \alpha_8 Loss_Unreal_{it} \\ & + \alpha_9 Leverage_{it} + \alpha_{10} InterestCoverage_{it} + \alpha_{11} CurrentRatio_{it} \\ & + \alpha_{12} Maturity_{it} + \alpha_{13} ReturnSD_{it} + \alpha_{14} EarnSD_{it} + \varepsilon_{i,t+1}. \end{aligned} \tag{3}$$

We use bond yield spreads (*Yield spread*) and bond ratings (*Rating*) interchangeably to proxy for the firm's *Cost of Debt*, the independent variable in (3). We repeat the analysis using the expected default frequency of the firms (*EDF*) to proxy for the equity-market pricing of risk. The specifications of *Yield spread*, *Rating*, and *EDF* are as outlined in Section 3. Note that we use yield spreads, bond ratings, and expected default frequencies based on their average values over year $t+1$ to capture the firm's cost of debt after the dividend payment. (Inferences remain the same when using the values as of end-of-year t.) All of the explanatory variables in (3) are as defined above and appear in Appendix C. In the regressions, we control for industry and year fixed effects.[50]

[50] Since the *DFUR* is relatively time invariant, the inclusion of firm fixed effects in the regressions may obscure a possible effect of DFUR on the cost of debt. Moreover, consistent with the survival analysis, the cost-of-debt regressions are based on firm-year observations for which a debt restructuring has not occurred yet. During the sample post-IFRS period, either such restructuring will occur later on or it will not.

Issuers with larger assets are more diversified and less risky than those with smaller assets and hence are expected to have a lower cost of debt. As indicated above, a firm's tangibility controls for the borrowers' credit quality and probability of default as well as for information asymmetries and hence is expected to be negatively associated with the firm's cost of debt. The association between the dividend payment and the cost of debt is unpredictable, due to the contradictory effects posited by the different hypotheses in the dividend literature (see the discussion in Section 2). We expect greater profitability to be negatively related to the cost of debt. As in the default analysis, we do not predict whether the association between earnings and the cost of debt differs for realized and unrealized earnings. A firm's cost of debt is expected to increase with its leverage, because the latter is associated with financial risk as well as with agency problems.[51] Likewise, the cost of debt is expected to increase with returns and earnings volatility. Higher interest coverage is expected to be associated with lower cost of debt, because firms that generate more cash internally can better service their debt (e.g., Pittman and Fortin 2004). The firm's current ratio, another measure of its liquidity, is also expected to be negatively associated with its cost of debt. Finally, bond yield spreads, bond ratings, and expected default frequencies are expected to decline with bond maturity, due to the reduced risk of debt recycling problems and because less risky firms tend to issue longer maturity bonds (Duffie and Lando 2001; Yu 2005).

The estimation results of the cost-of-debt regressions are displayed in Table 5, Panel A.[52] For each specification—*Yield spread*, *Rating*, and *EDF*—the left-hand column is based on the pooled sample, while the right-hand column is based on the propensity score-matched sample of firms. The coefficient on *DFUR*, our main variable of interest, is insignificant in the *Rating* and *EDF* regressions—both in the pooled sample and in the propensity score-matched sample of firms. In the *Yield spread* regression, the coefficient on *DFUR* is significantly positive at the 5% level, using the pooled sample, while in the propensity score-matched sample, it is not significant. All of the other control variables are generally with the expected sign and significance. We repeat all of the regressions with controls for firm fixed effects (instead of industry fixed effects). The results (untabulated for parsimony) show that the coefficient on *DFUR* is insignificant in all specifications, including in the pooled sample yield-spread regression. Apparently, in the absence of controls for firm fixed effects, the significant coefficient on *DFUR* in the pooled sample yield-spread regression captures other firm characteristics that are correlated with bond yield spreads. Indeed, once these differences between the firms are controlled for, either by including firm fixed effects or by removing nonmatching firms using propensity-score matching, the results reveal an

[51] According to Jensen and Meckling (1976), a high degree of leverage causes agency problems by creating incentives to shift risk and substitute assets.

[52] When the cost of debt is proxied by bond ratings, the estimations of (3) exclude nonrated firm-years, resulting in the smaller number of observations in the *Rating* regressions. Nevertheless, our *Rating* variable has sufficient variation in the sample (see Table 2, Panel B) to allow a reliable statistical analysis. We repeated all of the analyses, including the debt restructuring analysis, using only firm-years for which we had *both* bond ratings and bond yield spreads. (In other words, we used the same number of observations throughout the study.) The results obtained from these analyses (untabulated for parsimony) are qualitatively similar to the results obtained from using all of the observations available for each regression separately (tabulated).

Table 5 Cost of debt regressions

	Rating		Yield spread		EDF	
	Pooled sample (1)	PSM sample (2)	Pooled sample (3)	PSM sample (4)	Pooled sample (5)	PSM sample (6)
Panel A. Baseline specification						
Intercept	8.960***	8.666***	20.000**	55.870**	11.880**	4.699
	(1.288)	(1.954)	(9.970)	(24.995)	(5.135)	(6.267)
DFUR	0.243	−0.462	8.109**	4.627	1.247	−0.236
	(0.344)	(0.397)	(3.459)	(4.419)	(1.226)	(1.558)
DivPayout	−0.126	−0.081	−1.702*	−1.483	−0.339**	−0.201
	(0.103)	(0.191)	(0.919)	(1.672)	(0.147)	(0.272)
Size	−3.012***	−4.233***	−9.163***	−13.340**	−0.142	1.434
	(0.519)	(0.849)	(3.319)	(6.555)	(0.956)	(1.935)
Tangibility	−1.645**	−1.754	−3.746	−8.890	−2.557	−4.635
	(0.823)	(1.219)	(7.383)	(15.980)	(1.983)	(3.748)
ROA_Real	−3.368*	−0.673	−42.130**	−100.700***	−6.162**	−3.377
	(1.985)	(2.615)	(20.086)	(33.940)	(2.713)	(5.065)
Loss_Real	0.632**	0.466	0.045	−4.061	1.814***	2.084**
	(0.249)	(0.351)	(2.471)	(4.565)	(0.581)	(0.933)
ROA_Unreal	−4.097*	−0.828	−38.050**	−93.770***	−1.688	0.260
	(2.121)	(2.579)	(16.234)	(28.953)	(2.880)	(5.322)
Loss_Unreal	−0.159	−0.302	−2.881	−6.895	−0.222	−0.054
	(0.329)	(0.695)	2.044)	(5.045)	(0.466)	(1.128)
Leverage	4.452***	8.241***	35.370*	42.820	3.219**	4.057***
	(1.474)	(2.375)	(18.384)	(32.326)	(1.414)	(1.321)
InterestCoverage	0.001	0.000	0.012	0.017	0.0002	0.003
	(0.002)	(0.002)	(0.013)	(0.023)	(0.005)	(0.004)

Table 5 (continued)

	Rating		Yield spread		EDF	
	Pooled sample (1)	PSM sample (2)	Pooled sample (3)	PSM sample (4)	Pooled sample (5)	PSM sample (6)
CurrentRatio	−0.162 (0.106)	−0.192 (0.155)	−0.207 (0.373)	−0.651 (0.677)	−0.416** (0.179)	−0.215 (0.235)
Maturity	−0.199* (0.108)	−0.238 (0.196)	−3.303*** (1.081)	−6.203*** (2.206)	−0.250 (0.197)	−0.768** (0.331)
ReturnSD	26.070* (14.953)	44.930* (23.126)	182.300** (73.068)	294.700* (170.799)	51.550** (23.110)	95.930*** (35.710)
EarnSD	0.021*** (0.007)	0.031*** (0.007)	0.060 (0.041)	0.054 (0.062)	0.021 (0.023)	0.024 (0.039)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.435	0.520	0.252	0.338	0.332	0.306
No. Obs.	398	211	677	340	743	328
Panel B. Including a future default indicator						
Intercept	8.569*** (1.177)	8.409*** (1.883)	14.210* (8.602)	26.470 (20.707)	9.526** (4.773)	−8.111 (7.029)
DFUR	−0.012 (0.314)	−0.470 (0.418)	5.020* (2.709)	4.565 (3.508)	0.320 (1.319)	−0.457 (1.703)
DR	2.203*** (0.597)	1.150** (0.556)	30.010*** (6.651)	22.720*** (6.736)	9.254*** (1.954)	9.144*** (2.296)
*DFUR*DR*	0.099 (1.069)	0.002 (1.033)	−3.664 (13.111)	−3.129 (11.791)	1.909 (3.346)	1.856 (3.287)
DivPayout	−0.128 (0.107)	−0.107 (0.196)	−1.448 (0.960)	−1.507 (1.715)	−0.321** (0.150)	−0.239 (0.276)

Table 5 (continued)

	Rating		Yield spread		EDF	
	Pooled sample (1)	PSM sample (2)	Pooled sample (3)	PSM sample (4)	Pooled sample (5)	PSM sample (6)
Size	−2.514***	−3.621***	−5.817*	−8.484	0.598	2.763
	(0.480)	(0.865)	(2.996)	(6.435)	(0.883)	(1.836)
Tangibility	−0.940	−1.465	−2.128	−7.467	−1.543	−3.654
	(0.788)	(1.265)	(7.811)	(16.074)	(1.840)	(3.367)
ROA_Real	−3.296*	−1.134	−39.860**	−95.210***	−5.145**	−1.762
	(1.762)	(2.596)	(19.076)	(32.217)	(2.615)	(4.649)
Loss_Real	0.606**	0.460	−0.712	−4.433	1.817***	2.217**
	(0.253)	(0.351)	(2.404)	(4.455)	(0.569)	(0.897)
ROA_Unreal	−4.106**	−1.281	−34.680**	−86.720***	−0.274	2.657
	(1.765)	(2.432)	(15.716)	(26.450)	(3.720)	(5.090)
Loss_Unreal	−0.083	−0.201	−1.935	−5.481	−0.184	0.049
	(0.314)	(0.683)	(1.954)	(4.979)	(0.448)	(1.065)
Leverage	3.141**	6.745***	29.860**	39.340	2.820***	3.987***
	(1.396)	(2.539)	(15.140)	(27.835)	(1.035)	(1.058)
InterestCoverage	0.001	0.0003	0.014	0.017	0.001	0.003
	(0.002)	(0.002)	(0.012)	(0.023)	(0.004)	(0.004)
CurrentRatio	−0.137	−0.172	−0.175	−0.490	−0.301*	−0.037
	(0.106)	(0.159)	(0.254)	(0.500)	(0.178)	(0.235)
Maturity	−0.195*	−0.260	−2.918***	−5.844***	−0.245	−0.708**
	(0.108)	(0.197)	(1.047)	(2.126)	(0.189)	(0.339)
ReturnSD	24.490*	45.030*	140.100**	249.200	47.670**	90.800**
	(14.395)	(23.587)	(68.613)	(160.678)	(22.301)	(35.849)
EarnSD	0.018***	0.027***	0.044	0.026	0.019	0.022
	(0.006)	(0.008)	(0.040)	(0.063)	(0.021)	(0.037)

Table 5 (continued)

	Rating		Yield spread		EDF	
	Pooled sample (1)	PSM sample (2)	Pooled sample (3)	PSM sample (4)	Pooled sample (5)	PSM sample (6)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.489	0.543	0.353	0.386	0.436	0.438
No. Obs.	398	211	677	340	743	328

Table 5 presents the results of the cost-of-debt fixed-effects regressions. Bond ratings (*Rating*), bond yield spreads (*Yield spread*), and expected default frequencies (*EDF*) are used interchangeably to proxy for the firm's cost of debt. Panel A shows the results of the baseline specification (Eq. 3), while Panel B displays the results of the model including *DR* and *DFUR*DR*. *DR* is a dummy variable for a future debt restructuring, and *DFUR*DR* is the interaction between *DFUR* and *DR*. In both panels, the results presented in columns (1) and (2) are based on the pooled sample, while the results in columns (3) and (4) are for the restricted sample of ex ante similar (propensity-score matched) firms. All of the variables are defined in Appendix C. Entries are coefficients; standard errors clustered at the firm level appear in parentheses. ***, **, and * indicate significance at the 1%, 5% and 10% (two-tailed) levels, respectively

insignificant association between DFUR and bond yield spreads, consistent with the results for bond ratings and for expected default frequencies.[53]

Overall, the results of the cost-of-debt analyses suggest that the distribution of dividends based on unrealized earnings does not directly affect either measure of the market pricing of risk.[54] In other words, it appears that debtholders do not price-protect themselves from, and rating agencies do not predict, a greater likelihood of default following the distribution of dividends originating from unrealized earnings. Note that the insignificant difference in the cost of debt between DFUR and non-DFUR firms is unlikely to result from debtholders, and/or rating agencies not recognizing the possibility that firms paid out dividends based on unrealized earnings. As indicated above, in DFUR firms, there was a substantial, easily observable, increase in the dividend payout ratios, following the adoption of fair value accounting (with the amount of dividends exceeding the amount of distributable realized earnings), which did not occur in non-DFUR firms. Concomitantly, DFUR firms recognized significant amounts of unrealized earnings, whereas in non-DFUR firms unrealized earnings hovered around zero. Moreover, as part of their methodology for rating firms, rating agencies pay close attention to changes in dividend payout ratios in the analyzed firms.[55]

Note, too, that the results do not imply that the bond market is inefficient in general. In the univariate analysis subsection, we provide initial evidence showing that the bond market is indeed efficient in terms of anticipating a higher default risk (and consequently charging a higher cost of debt) in settings other than DFUR. We supplement the univariate evidence with evidence from a multivariate analysis by adding two variables to the cost-of-debt model (Eq. 3): (1) a dummy variable for a future debt restructuring (*DR*) and (2) an interaction between *DFUR* and *DR* (*DFUR*DR*). The results presented in Panel B of Table 5 show that the coefficient on *DR* is significantly positive (at the 1% level) in all of the model specifications, whereas the coefficient on *DFUR*DR* is consistently insignificant. This finding indicates that bondholders (rating agencies) can identify a higher default risk. Thus they can anticipate a future debt restructuring and charge a higher rate of return (reduce the bond's rating). However, the insignificance of both *DFUR* and *DFUR*DR* suggests that bondholders (rating agencies) do not anticipate a higher default risk for DFUR firms. Therefore they do not price-protect themselves from an imminent debt restructuring, due to DFUR (reduce the bond's rating). In other words, we rule out the possibility that bondholders may *not* be

[53] In an additional analysis, we ran the bond yield-spread regressions including the firm's bond ratings as another control to explore the possibility that the adoption of fair value accounting affects a firm's cost of debt through its impact on credit ratings (Anderson et al. 2003; Mansi et al. 2004; Magnan et al. 2016). Additionally, we repeated the cost-of-debt regressions, expanding the period prior to the adoption of IFRS (i.e., for 2004–2013). Untabulated results show that our main findings remain unchanged. Importantly, there is no empirical evidence that endogeneity affects our inferences.

[54] In an additional analysis, we examined stock return volatility as an alternative risk indicator (e.g., Campbell and Taksler 2003), prior to the distribution of dividends originating from unrealized earnings and thereafter. We compared the stock volatility (our *ReturnSD*) for ex post DFUR and non-DFUR firms prior to the adoption of IFRS, when firms could not pay dividends based on unrealized earnings, and after the adoption, when such payments became possible. Untabulated results show that for both subperiods, *ReturnSD* is insignificantly different in the two groups of firms. The difference-in-difference is also insignificant. Thus there is no evidence that the increased default risk documented for DFUR firms in the post-IFRS period affects equity volatility.

[55] See, for example, S&P Global Ratings, RatingsDirect, Methodology: Investment Holding Companies, http://www.maalot.co.il/Publications/MT20170124145506.pdf.

charging a higher cost of debt from and rating agencies may *not* be reducing the rating of DFUR firms only when they *do not* anticipate that a dividend distribution based on unrealized earnings might cause a default.

Altogether, in line with the wealth redistribution hypothesis, the results suggest that dividends originating from unrealized earnings place the firm's debtholders at greater risk. Nevertheless, debtholders do not price this greater risk, nor do analysts account for it when rating a DFUR firm's debt. As discussed above, this failure may result from a belief that these dividends convey information about the firm's financial solidity and/or about the managers' commitment to the diligent use of the firm's resources. By allowing themselves to distribute dividends based on unrealized earnings, DFUR firms seem to be sending a strong signal to the market about their ability to generate future cash flows sufficient to pay off their debts and then some to fund growth opportunities. Our evidence, however, reveals this signal to be false, suggesting that DFUR disrupts the signaling equilibrium. Given the opacity of unrealized earnings, debtholders as well as rating agencies should place less weight on the information that the distribution of these earnings as dividends may be conveying.[56]

4.2.4 A difference-in-difference analysis

In this subsection, we expand our analyses of the firms' default risk and cost of debt to the period that preceded IFRS adoption, employing a difference-in-difference design.[57] Specifically, we explore DFUR versus non-DFUR firms' propensity to default on their debt (cost of debt) *before* the adoption of IFRS and compare this difference with the difference in the firms' propensity to default on their debt (cost of debt) *after* the adoption of IFRS. Of particular interest is assessing whether DFUR firms were more likely than non-DFUR firms to default on their debt prior to IFRS, even without distributing dividends based on unrealized earnings. To that end, for each firm, we calculate the propensity to default in the pre- and post-IFRS periods (2004–2013), using the coefficients from model 1. (Recall that information on default occurrences during the pre-IFRS period is unavailable.)[58] The cost of debt is proxied by *Rating*, *Yield spread*, and *EDF* as in the previous subsection.

Table 6, Panel A, displays the results of univariate difference-in-difference tests. Panel B shows the estimation results of a multivariate difference-in-difference design, where the fitted values from the survival model (the cost-of-debt proxies) in both the pre- and post-IFRS periods are regressed on an indicator of ex post DFUR firms, an interaction between the firm type and an indicator of the post-IFRS period (*DFUR*PostIFRS*) as well as all the other controls as in models 1 and 3. Note that *DFUR* takes the value of 1 for ex post DFUR firms both in the pre- and

[56] We examine and find that a Merton-type model, such as the expected default frequency, can be used by investors and analysts to distinguish between firms that have a high probability of survival, even after paying dividends originating from unrealized earnings, and firms that have a high probability of default. A comparison of DFUR firms with expected default frequency values above/below the DFUR sample median just prior to IFRS adoption reveals that DFUR firms with ex ante higher/lower expected default frequencies experience more/fewer occurrences of debt restructurings following the payout (8.8% versus 1.4%, p value = 0.05).

[57] We thank an anonymous referee for proposing this additional analysis.

[58] The *DFUR* explanatory variable takes the value of 0 throughout the pre-IFRS period.

Table 6 Default risk and cost of debt across DFUR and non-DFUR firms in the pre- and post-IFRS period: a difference-in-difference analysis

Panel A. Univariate difference-in-difference analysis

	Pre-IFRS			Post-IFRS			Diff-in-diff
	Ex post DFUR firms	Ex post Non-DFUR firms	Difference	DFUR firms	Non-DFUR firms	Difference	
Default probability							
Mean	0.041	0.055	−0.014	0.572	0.407	0.165*	0.179
Median	0.018	0.023	−0.005	0.128	0.049	0.078***	0.083***
Rating							
Mean	5.130	4.806	0.324	7.058	6.590	0.469*	−0.145
Median	4.000	5.000	−1.000	7.000	6.000	1.000**	−2.000
Yield spread							
Mean	0.027	0.040	−0.013**	0.223	0.178	0.045	−0.058
Median	0.021	0.026	−0.005	0.051	0.054	−0.003	−0.002
EDF							
Mean	0.031	0.033	−0.002	0.035	0.071	−0.036	0.034
Median	0.017	0.015	0.002	0.018	0.039	−0.021	0.023

Panel B. Multivariate difference-in-difference specification

	Default probability (1)	Rating (2)	Yield spread (3)	EDF (4)
Intercept	−0.291	6.277***	−21.010**	3.478
	(0.282)	(1.414)	(8.835)	(2.680)
DFUR	−0.017	−0.218	−6.699*	0.298
	(0.095)	(0.788)	(3.839)	(1.564)
*DFUR*IFRS*	0.438***	0.162	11.310***	1.559
	(0.128)	(0.815)	(4.099)	(1.704)
DivPayout	−0.023	−0.315***	−0.781	−0.365
	(0.021)	(0.116)	(0.966)	(0.255)
Size	−0.211***	−2.137***	−3.697	−0.061
	(0.057)	(0.432)	(2.657)	(0.783)
Tangibility	−0.238**	−1.274*	−1.348	−2.012
	(0.106)	(0.656)	(3.537)	(1.343)
ROA_Real	−2.498***	−5.264***	−66.400**	−7.079***
	(0.598)	(1.812)	(28.106)	(2.409)
Loss_Real	−0.071	1.037***	1.101	3.071***
	(0.071)	(0.369)	(3.753)	(0.769)
ROA_Unreal	−2.915***	−7.007***	−65.980***	−9.169**
	(0.671)	(2.229)	(23.350)	(4.219)
Loss_Unreal	−0.167**	−0.001	0.808	−0.654
	(0.077)	(0.426)	(3.279)	(0.833)
Leverage	1.209***	6.148***	54.300***	1.555
	(0.315)	(1.907)	(10.625)	(0.962)
InterestCoverage	−0.002**	−0.002	0.009	−0.007
	(0.001)	(0.003)	(0.020)	(0.006)

Table 6 (continued)

CurrentRatio	−0.040** (0.018)	−0.090 (0.114)	−0.377 (0.541)	−0.427*** (0.086)
Maturity	−0.099*** (0.027)	−0.151 (0.093)	−4.449*** (1.241)	−0.322 (0.227)
ReturnSD	15.520*** (4.482)	70.630*** (25.538)	378.900*** (123.663)	143.300*** (35.915)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
R^2	0.631	0.515	0.379	0.355
No. Obs.	1318	501	912	1022

Table 6 presents the propensity of the DFUR sample firms to default on their debt as well as their cost of debt, compared to non-DFUR firms, prior to IFRS adoption and following the adoption. The table reports on the differences across the two groups of firms in each period as well as the differences in the differences across the two periods. The default probability is proxied by the fitted values from our survival model 1 in the pre- and post-IFRS periods (2004–2013). The firms' cost of debt is proxied by our *Rating*, *Yield spread*, and *EDF* variables, as defined in Appendix C. Panel A shows the results of the univariate difference-in-difference analysis. Panel B shows the estimation results of a multivariate difference-in-difference design, where the fitted values from the survival model (in column 1) and the cost of debt proxies (in columns 2–4) in both the pre- and post-IFRS periods are regressed on an indicator of ex post DFUR firms (*DFUR*), an interaction between *DFUR* and an indicator of the post-IFRS period (*DFUR*PostIFRS*), and the other controls, including fixed effects, as in models 1 and 3. The coefficient on *DFUR*IFRS* in a regression that includes both the pre- and post-IFRS periods captures the difference-in-difference in the likelihood of default or cost of debt for the DFUR firms. Entries in Panel B are coefficients; standard errors clustered at the firm level appear in parentheses. In both panels, ***, **, and * indicate significance at the 1%, 5% and 10% (two-tailed) levels, respectively

post-IFRS periods, thereby standing in for DFUR versus non-DFUR firm fixed effects.[59] *DFUR*PostIFRS* takes the value of 1 only in the post-IFRS period (for DFUR firms), thereby capturing the difference-in-difference in the likelihood of default (cost of debt) for the DFUR firms.[60] The univariate analysis shows that the ex post DFUR firms were *not* ex ante more likely to default on their debt than the ex post non-DFUR firms *before* the adoption of IFRS. They became so in the post-IFRS period. The difference-in-difference between the two groups between the pre- and post-IFRS periods is statistically (in)significant at the 1% level, according to the median (average) likelihood of a default. The results of the multivariate analysis indicate that, controlling for all the other relevant variables, the difference-in-difference in the likelihood of a default of DFUR firms in the post-IFRS period is strongly significant, as captured by the coefficient on *DFUR*PostIFRS* (0.438; *p* value <1%). Thus the inconclusive difference-in-difference in the univariate analysis appears to result from the omission of relevant factors. As in the univariate analysis, there is no indication of ex post DFUR firms being ex ante more likely to default on their debt in the pre-IFRS period, as captured by the insignificantly

[59] For consistency, tabulated results are for the models including industry and year fixed effects (see the explanation in the previous subsection). Untabulated results including firm, instead of industry, fixed effects and instead of the *DFUR* variable that is subsumed by the firm fixed effects, generally yield the same results. We also point out that in the difference-in-difference design, the variable *EarnSD* was excluded from the model, due to the small number of observations in the pre-IFRS period.

[60] The inclusion of a dummy for the post-IFRS period is redundant, given that year fixed effects are controlled for in the equation.

Table 7 Abnormal bond returns around dividend announcements

	DFUR firms	Non-DFUR firms	Difference
Treating each bond as a separate observation			
Mean	0.034%	−0.008%	0.042% (p value = 0.418)
Median	−0.008%	−0.022%	0.014% (p value = 0.971)
Treating each firm as a separate observation			
Mean	0.055%	−0.008%	0.063% (p value = 0.935)
Median	−0.005%	−0.022%	0.017% (*p* value = 0.809)

Table 7 shows the mean and median abnormal bond returns on the date of dividend announcements made by DFUR firms versus non-DFUR ones. The daily abnormal bond returns are computed based on Handjinicolaou and Kalay (1984), accounting for the changes in the risk-free interest rate term structure. For firms with multiple bonds outstanding, we use two alternative approaches to dealing with the potential bias resulting from a possible correlation between these bonds: (1) treating each bond as a separate observation and (2) treating each firm as a portfolio of market-value-weighted bonds and thus treating each firm as a separate observation. For the mean abnormal returns, the *p* values are calculated after standardizing the excess returns by their estimation period's standard deviation. Calculating the p values without such standardization does not alter our inferences

negative coefficient on *DFUR*. Determining that the DFUR group of firms was *not* more likely to default on their debt prior to IFRS, when the distribution of unrealized earnings did *not* happen, but became so following such distributions in the post-IFRS period, with the relative increase in the default risk, compared to that of non-DFUR firms being significant, constitutes triangulating evidence, supporting a direct link between the distribution of dividends based on unrealized earnings and the greater likelihood of a subsequent default.

As for the cost of debt, the univariate difference-in-difference tests are all statistically insignificant, according to the *Rating*, *Yield spread*, and *EDF* measures and according to both the mean and median of the three measures. In the multivariate analysis (Table 6, Panel B, columns 2–4), the coefficient on *DFUR*PostIFRS* is insignificant, according to the *Rating* and *EDF* measures, and significant, according to the *Yield spread* measure only (11.310; p value at 1%). This result is consistent with our findings from the baseline cost of debt specification, based on pooled samples (see Table 5). Overall, the relative change in the DFUR firms' cost of debt in the post-IFRS period, compared to that of non-DFUR firms, appears to be insignificant according to most measures. According to the bond yield spread proxy, there is weak evidence that players in the bond market—unlike their stock-market counterparts and the rating agencies—react (at least to some extent) to the distribution of dividends based on unrealized earnings.

4.2.5 Event-study analysis: The market reaction to dividend announcements

In this subsection, we supplement our tests of the economic consequences of dividend payments originating from unrealized earnings with an event-study methodology, in which we examine the market reaction to dividend announcements made by DFUR firms, compared to the reaction to such announcements by non-DFUR firms.

Specifically, we compare the abnormal returns on bonds around dividend announcements made by both types of firms throughout the sample period.[61]

The daily abnormal bond returns are computed based on Handjinicolaou and Kalay (1984), accounting for the changes in the risk-free interest rate term structure. Specifically, for each bond, we calculate the excess return over a government bond with comparable duration and indexation characteristics. The abnormal return for each bond is then obtained by subtracting from this excess return the average excess return over an estimation period of 45 trading days ending 16 days before the dividend announcement date. In case a firm has multiple bonds outstanding, we use two alternative approaches to dealing with the potential bias resulting from a possible correlation between these bonds (e.g., Maxwell and Stephens 2003): (1) treating each bond as a separate observation and (2) treating each firm as a portfolio of market-value-weighted bonds (and thus treating each firm as a separate observation).

Table 7 shows that, according to both approaches, the mean and median bond abnormal returns on the announcement date do not differ significantly between DFUR and non-DFUR firms. Thus bondholders do not seem to respond differently to dividends paid by DFUR firms. Remarkably, the bond returns are insignificantly *higher* for these firms. We point out that the qualitative results remain unaltered even if we extend the event window to include the day after the dividend announcement.[62,63] Overall, the results of the event study, together with the results of the cost-of-debt analysis, establish a misperception of the market, with respect to the risk embedded in dividends originating from unrealized earnings.

5 Robustness tests

To test the robustness of the results further, we conduct the following separate sensitivity analyses (results untabulated for parsimony).

5.1 *Differentiating between real estate and non-real estate firms*

The fact that around 60% of the DFUR firms as well as of the defaulting firms, in our sample, are real estate firms requires that we examine whether this subgroup of firms is driving our results. We thus repeat our analyses for nonreal estate firms (all of the firms in our sample that are not affiliated with the real estate industry) and real estate

[61] We use daily bond return data from the Bank of Israel. Dividend announcement dates were obtained from the Bloomberg Professional database.

[62] In the statistical tests for the cumulative two-day abnormal returns, we used the simplifying assumption of intertemporal independence of abnormal returns over the bonds' holding periods.

[63] In an additional analysis, we compared the abnormal returns on *stock*s around the dividend announcements made by DFUR versus non-DFUR firms. The abnormal stock returns are computed based on the market model (as explained in MacKinlay 1997), estimated using share prices over a period of 45 trading days ending 16 days before the dividend announcement date (as with the bonds). Untabulated results show no significant difference between the two groups of firms in abnormal stock returns around the announcement day. Thus, like the bond market, the stock market does not seem to respond differently to payouts made by DFUR versus non-DFUR firms.

separately. The separate estimations show that our results still hold when real estate firms are excluded. We conclude that our results are not driven solely by the prevalence of real estate firms.

5.2 A sensitivity analysis of the definition of DFUR

Our classification of firms is a key element of this study. We thus examine the robustness of our results to an alternative definition of DFUR to alleviate concerns that our results may be driven by a specific classification measure. In our sensitivity analysis of the definition of DFUR, we replace the *DFUR* indicator variable with a continuous variable that captures the dividend payments from unrealized earnings in the regressions. To that end, we calculate a dividend-payout-based measure of DFUR as follows: the numerator is the total amount of cash dividends paid *in excess* of the total amount of distributable *realized* earnings throughout the post-IFRS period; the denominator is the total net income (realized plus unrealized) for this period. The results indicate that the greater the dividend payments originating from unrealized earnings, the more likely the firm will subsequently need debt restructuring. Hence the results obtained using this alternative measure are consistent with those obtained using our other DFUR specifications, providing additional evidence supporting our inferences.

5.3 *Excluding crisis years from the analysis*

We also investigate whether the fact that our sample period includes the subprime crisis years of 2008 and 2009 affects our results. In 2008, seven debt restructurings occurred, while in 2009, the number jumped to 27 (see Fig. 1). Note that the number of debt restructurings in 2011 and 2012 is not much smaller than that in the 2009 crisis year (23 and 20, respectively). Nevertheless, given that, during a financial crisis, firms are more likely to encounter financial distress, we want to examine whether our results hold when the subprime crisis years are excluded from the analysis. We thus repeat our analyses for the subsample that excludes the years 2008 and 2009. The results using noncrisis years only are qualitatively similar to those obtained for the entire sample period.

5.4 *Differentiating between firms by the degree of their bonds' liquidity*

We examine the sensitivity of our results to the degree of the liquidity of the firms' bonds. Specifically, we divide the sample firms into those with more liquid versus less liquid bonds, once according to their bonds' bid-ask spread and once according to their bonds' quoted size.[64] Results show that the documented mispricing of increased default risk in DFUR firms is not driven by the degree of the bonds' liquidity. This result allays the concern that a few firms with bonds of limited liquidity drive the documented mispricing of default risk.

[64] Both measures were obtained from the Bank of Israel.

5.5 Controlling for the quality of the firm's information environment

We repeat the analyses including an indicator of the quality of the firm's information environment as well as the interaction between the latter and DFUR.[65] The quality of the firm's information environment or the level of information asymmetry may affect its propensity to pay dividends (Hail et al. 2014; Kalay 2014) as well as its cost of debt (e.g., Riedl and Serafeim 2011). With greater information asymmetries, the firm's need to distribute cash as dividends (thereby diluting cash resources for future growth) to mitigate agency problems is increased (the substitution hypothesis; La Porta et al. 2000). An alternative theory suggests that, with greater information asymmetries, minority shareholders are less able to use their legal power to force firms to distribute cash as dividends to reduce the risk of expropriation (the outcome hypothesis; La Porta et al. 2000). As for the effect on the cost of debt, firms with greater information asymmetries have more information risks and thus are expected to have a higher cost of capital (e.g., Hughes et al. 2007; Riedl and Serafeim 2011).

We use firm size at fiscal year-end *t-1* as our indicator of the degree of the firm's ex ante information asymmetry. Consistent with previous research, smaller (larger) firms have greater (smaller) information asymmetries.[66] Consistent insignificant coefficients on the firm-size indicator as well as on the interaction between the latter and DFUR in the survival and cost-of-debt analyses indicate that the inferences from our study are robust to the quality of the firm's information environment. Importantly, the coefficient on *DFUR* across all specifications remains qualitatively unchanged. Thus the lack of market reaction to DFUR documented in this study is not driven by firms with more information asymmetry.

5.6 An alternative procedure to address endogeneity concerns: Two-stage regression analysis

In our main analyses, we addressed self-selection concerns using a propensity-score matching procedure to identify a control group of non-DFUR firms with an ex ante propensity to pay dividends based on unrealized earnings similar to that of our DFUR firms. As an alternative procedure, we employ a two-stage regression analysis. In particular, we use the two-stage residual inclusion method (Hausman 1978), which is appropriate in settings where both the first- and second-stage equations are nonlinear (in our case, a probit DFUR model and a Cox proportional hazard model, respectively).[67] In the first stage, we estimate a probit model of our (potentially endogenous) *DFUR* indicator on all of the control variables from the

[65] We thank an anonymous referee for suggesting this additional analysis.

[66] Smaller (larger) firms are firms with total assets below (above) the sample median. Another control for information asymmetry used in previous studies is analyst coverage (generally proxied by the number of analysts covering the firm). In Israel, the extent of firm coverage by analysts is relatively limited. Moreover, none of the firms that needed debt restructuring during the sample period were covered by analysts. Hence this proxy cannot be used in the survival analysis.

[67] Terza et al. (2008) show this method to be theoretically consistent and superior to the alternative (inconsistent) method of two-stage predictor substitution.

survival model (Eq. 1) as well as on a firm's ex ante value gained from a transition to IFRS (our *ExAnteValueGain*) as an instrumental variable (IV).[68] In the second stage, we estimate the survival model, including the first-stage residuals as an additional regressor.

The results are consistent with those documented in the main analyses. DFUR remains positively and significantly associated with the likelihood of a future default (p value <5%), consistent with the distribution of dividends based on unrealized earnings being detrimental to the firm, even after controlling for possible endogeneity. The coefficient on the first-stage residuals variable is not significantly different from zero, and hence there is no empirical evidence that endogeneity affects our inferences. We acknowledge, though, that this is far from being a proof of no endogeneity. In particular, it may stem from the limitations of our instrumental variable or from low power of the test.[69] We also estimate the second-stage cost of debt regressions. The results are consistent with our results from the pooled sample regressions (Table 5), and the first-stage residuals variable is insignificant, as in the survival analysis above.

6 Summary

This study highlights a factor affecting the financial stability of firms that must be considered in the era of fair value accounting: the distribution of dividends based on unrealized earnings arising from changes in the fair values of assets and liabilities. The repercussions of dividend payments originating from unrealized earnings for the firm are relevant to many countries where dividends may come from such earnings. We document a direct and significant impact of the distribution of dividends based on unrealized earnings on a firm's default risk, as captured by a substantially greater likelihood of requiring debt restructuring, following the payment. However, the market in general does not price this enhanced risk. Specifically, the bond ratings by credit rating agencies as well as the expected default frequency, according to a Merton-type model, are not directly affected by the firm's distribution of dividends originating from unrealized earnings. There is also evidence of the yields on the firms' bonds not being affected by such payouts, when we control for the ex ante propensity to distribute dividends based on unrealized earnings. We also show that the market reaction to dividend distributions by these riskier firms does not differ from its reaction to dividend distributions by other firms, as captured by insignificant differences in abnormal returns around dividend announcements made by DFUR versus non-DFUR firms. It seems that such distributions mislead investors and analysts, who regard them as

[68] Inclusion of all of the control variables from the second-stage equation is consistent with the two-stage residual inclusion method (e.g., Chen et al. 2013). We point out that in an alternative analysis of the first-stage probit model, instead of using all of the second-stage controls, we included only the four controls used in our propensity-score matching procedure (*Size*, *DivPayout*, *Leverage*, and *ExAnteValueGain*; see Table 4). The results of the second-stage analysis remained unchanged.

[69] The results from the first-stage analysis indicate that our ex ante valuation gain instrumental variable has a positive effect on the *DFUR* variable but that this effect is only marginally statistically significant (p value = 9.4%), suggesting a possible weak instrument problem.

a signal about the firm's financial solidity or believe they reduce potential agency problems. This misperception, in turn, (falsely) reduces the degree of uncertainty for these important market players, resulting in the increased default risk being mispriced.

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Appendix A

Unrealized earnings arising from fair value reporting as per IFRS

The International Financial Reporting Standards (IFRS) allow firms to recognize unrealized earnings that arise from changes in the fair value measurements of various assets and liabilities. These standards include IAS No. 39 *Financial Instruments: Recognition and Measurement* (as revised in 2005 and replaced by IFRS 9 *Financial Instruments*[70]), IAS No. 40 *Investment Property* (as revised in 2005), IAS No. 27 *Consolidated and Separate Financial Statements* (as revised in 2005), IAS No. 28 *Investment in Associates and Joint Ventures* (as revised in 2005), and IFRS 3 *Business Combinations* (as revised in 2008).

For this study, we hand-collected all information pertaining to gains and losses arising from the revaluations of assets and liabilities as per the international standards from the firms' annual financial statements.[71] In our analyses, we categorized the unrealized revaluation earnings into three groups: (1) unrealized earnings from revaluations of financial instruments (as per IAS 39); (2) unrealized earnings from revaluations of investment property (as per IAS 40); and (3) unrealized earnings from revaluations of investment in other entities (as per IAS 27, IAS 28, and IFRS 3). The table below summarizes the recognition rules for the three groups in accordance with the relevant standards, and provides the respective quantitative amounts of revaluation earnings in our sample. On average, the total unrealized earnings recognized by the sample firms constitutes about 29% of their total earnings (realized+unrealized): 6.5% arise from revaluations of financial instruments, 10.8% from revaluations of investment property, and 11.4% from revaluations of investments in other entities. As a percentage of (lagged) total assets, the aggregate unrealized earnings is close to 2%, of which 0.4%, 0.7%, and 0.8% are from revaluations of financial instruments, investment property, and investment in other entities, respectively.

[70] We point out that the replacement of IAS 39 by IFRS 9 has no impact on those parts of the standard relevant to our research.

[71] Revaluation earnings data are unavailable on financial databases such as Compustat or Bloomberg.

	Unrealized earnings from revaluation of:		
	Financial instruments	**Investment property**	**Investment in other entities**
Recognition rules	According to IAS 39, a gain or loss arising from a change in the fair value of a financial asset or a financial liability that is not part of a hedging relationship shall be recognized as follows:(a) A gain or loss on a financial asset or financial liability classified as held-for-trading, meaning, it was acquired or incurred principally for the purpose of selling or repurchasing it in the near term,[72] shall be recognized in profit or loss; (b) A gain or loss on an available-for-sale financial asset[73] shall be recognized in other comprehensive income, except for impairment losses and foreign exchange gains and losses, until the financial asset is derecognized. At that time, the cumulative gain or loss previously recognized in other comprehensive income shall be reclassified from equity to profit or loss as a reclassification adjustment (see IAS No. 1 *Presentation of Financial Statements* (as revised in 2007)).	IAS 40 applies to the accounting for property (land and buildings) held to earn rentals or for capital appreciation or both. According to IAS 40, a gain or loss arising from a change in the fair value of investment property shall be recognized in profit or loss for the period in which it arises.	When an entity becomes an investment entity, it accounts for an investment in a subsidiary at fair value through profit or loss in accordance with IAS 27.[74] The concepts underlying the procedures used in accounting for the acquisition of a subsidiary are also adopted in accounting for the acquisition of an investment in an associate. Thus, in accordance with IAS 28, an investment entity accounts for its investments in associates or joint ventures at fair value through profit or loss.[75] When a business combination is achieved in stages, and the acquirer obtains control of an acquiree in which it held an equity interest immediately before the acquisition date, in accordance with IFRS 3, the acquirer shall re-measure its previously held equity interest in the acquiree at its acquisition-date fair value and recognize the resulting gain or loss, if any, in profit or loss.
As % of:			
Net income	6.51%	10.80%	11.40%
Total assets	0.44%	0.73%	0.77%

[72] This type of financial asset/liability is referred to as "at fair value through profit or loss."

[73] Available-for-sale financial assets are those non-derivative financial assets not classified as (1) financial assets at fair value through profit or loss, (2) loans and receivables, or (3) held-to-maturity investments. Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Held-to-maturity investments are non-derivative financial assets with fixed or determinable payments and fixed maturity that an entity has the intention and ability to hold to maturity.

[74] If a parent is required to measure its investment in a subsidiary at fair value through profit or loss, it shall also account for its investment in a subsidiary in the same way in its separate financial statements.

[75] If, in accordance with IAS 28, an entity elects to measure its investments in associates or joint ventures at fair value through profit or loss, it shall also account for those investments in the same way in its separate financial statements. In compliance with IAS 28, many of the procedures appropriate for the application of the equity method are similar to the consolidation procedures described in IAS 27.

Appendix B

An example of the procedure for classifying a firm as DFUR versus non-DFUR

IDB Holdings Corporation Ltd. (IDB Holdings), an investment holding company in our sample,[76] adopted IFRS in 2006. To classify IDB Holdings, we conducted the following steps.

a. We first identified the firm-years in which dividends were distributed to shareholders.

Year	**2006**	**2007**	**2008**	**2009**	**2010**
Cash dividends[77]	747	585	576	828	438

During 2011–2013, no payouts were made.

b. We then classified the firm's reported net income into "realized" and "unrealized" over the payout years, using our hand-collected information about unrealized revaluation earnings, extracted from the firm's annual financial statements.

	2006	**2007**	**2008**	**2009**	**2010**
Unrealized earnings (net of taxes) from revaluations of:					
financial instruments (IAS 39)					900
investment property (IAS 40)					62
investment in other entities (IAS 27, IFRS 3)	892	317	207	158	1017
Total unrealized earnings	**892**	**317**	**207**	**158**	**1979**
Net income	619	849	−408	977	544
Net income – Total unrealized earnings = **Realized earnings**	**273**	**532**	**−615**	**819**	**−1435**

c. Next, we identified the firm's accumulated *realized* earnings not distributed thus far, i.e., the firm's distributable realized earnings. Distributable realized earnings are calculated as follows.

Annual realized earnings (from step b)
+ Beginning-of-year retained earnings (from the firm's financial statements)
- Beginning-of-year accumulated unrealized earnings,

[76] The investment holding firms in our sample are firms whose purpose is owning other firms' stock. The holding firms themselves typically do not produce goods/services; rather, their purpose is the formation of corporate groups.

[77] The amounts displayed in this appendix are in IS (Israeli Shekels) millions. During the sample period, the foreign exchange rate was in the range of 3.2–4.2 IS per 1 USD.

where beginning-of-year accumulated unrealized earnings is the aggregate sum of unrealized earnings recognized since 2006 (the first year of IFRS implementation) up until the previous year minus the amount of dividend payments based on unrealized earnings during this period. Applying this procedure to IDB Holdings we get the following.

	2006	2007	2008	2009	2010
Annual *realized* earnings	−273	532	−615	819	−1435
+ Beginning-of-year *total* retained earnings	1064	936	1200	216	365
– Beginning-of-year *unrealized* retained earnings	–[1]	892[2]	1200[3]	831[4]	365[5]
= End-of-year distributable *realized* earnings	**791**	**576**	**−615**	**204**	**−1435**

[1] 2006 was the first year of IFRS adoption; thus there are no accumulated unrealized earnings for January 1, 2006

[2] 892 = Unrealized earnings recognized in 2006 (see table above). In 2006, dividends were distributed based only on realized earnings

[3] 1,200 = Accumulated unrealized earnings 1.1.2007 (892) + unrealized earnings recognized in 2007 (317) – dividends paid in 2007 based on unrealized earnings (9)

[4] 831 = Accumulated unrealized earnings 1.1.2008 (1200) + unrealized earnings recognized in 2008 (207) – dividends paid in 2008 based on unrealized earnings (576)

[5] 365 = Accumulated unrealized earnings 1.1.2009 (831) + unrealized earnings recognized in 2009 (158) – dividends paid in 2009 based on unrealized earnings (624)

d. Next, we compared the amount of dividends distributed in each year with the firm's distributable realized earnings.
e. If the amount of dividends paid is greater than the distributable realized earnings, we infer that the excessive dividends were distributed based on unrealized earnings. Otherwise, we infer that the firm did not distribute dividends based on unrealized earnings.

	2006	2007	2008	2009	2010
End-of-year distributable *realized* earnings	791	576	−615	204	−1435
Cash dividends paid	747	585	576	828	438
DFUR/non-DFUR classification	**Non-DFUR**	**DFUR**	**DFUR**	**DFUR**	**DFUR**
Dividend paid based on realized earnings	747	576	0	204	0
Dividend paid based on unrealized earnings	–	9	576	624	438

As shown in the table above, IDB Holdings is identified as a DFUR firm as of 2007. The amount of dividend payments based on unrealized earnings for each year the firm was identified as DFUR is the difference between the cash dividends paid and the distributable realized earnings

Appendix C

Definitions of the variables

Total assets	Total assets in the firms' balance sheets in $ millions.
ROA_Realized	Net income minus total unrealized earnings (net of taxes), scaled by lagged total assets.
Unrealized ROA-Total	Total unrealized earnings, manually extracted from each firm's annual financial statements throughout the sample period, scaled by lagged total assets.
Unrealized ROA from revaluation of:	Unrealized earnings (scaled by lagged total assets) arising from changes in the fair values of:
financial instruments;	financial instruments (as per IAS 39);
investment property;	investment property (as per IAS 40);
investment in other entities	investment in subsidiaries (as per IAS 27 and IFRS 3) as well as of investment in associates and joint ventures and joint arrangements (as per IAS 28).
Dividend /total earnings	The rate of the dividend payout ratio, calculated as the total cash dividend paid to common and preferred shareholders divided by total earnings.
Dividend /realized earnings	The total cash dividend divided by realized earnings, where realized earnings is net income minus total unrealized earnings (net of taxes).
Current ratio	Current assets divided by current liabilities.
Interest coverage	The ratio of operating profits to interest expense.
Leverage	The ratio of total debt to total assets.
Altman's Z-score	A measure for predicting bankruptcy as per Altman et al. (Altman et al. 1998).
EDF[a]	Expected default frequency: a market-based measure of the likelihood of the firm to declare bankruptcy within one year. It is obtained from the application of the Merton model for evaluating the likelihood of the failure of a company (Merton 1974).
Yield spread[a]	The basis point spread between the market-value-weighted yield on a firm's bond and that on a government bond with comparable duration and indexation characteristics.
Rating[a]	The firm's bond rating specified as a continuous variable.[b]
DFUR	A dummy variable that equals 1 for a firm that distributed dividends from its unrealized earnings and 0 otherwise.
DivPayout[c]	Cash dividend payouts divided by total earnings.
Size	The natural logarithm of total assets.
Tangibility	The proportion of fixed assets to total assets.
ROA_Real (*Unreal*)	(Un)realized earnings divided by total assets.
Loss_Real (*Unreal*)	A dummy variable that equals 1 if *ROA_Real* (*Unreal*) is negative and 0 otherwise.
Maturity	Weighted average of the duration of all of the firm's traded bonds.
EarnSD	The standard deviation of net income over the last five years (year t-4 through year t).
ReturnSD	The standard deviation of daily stock returns over the last year (year t).
OwnerConc(*_sq*)	Ownership concentration (squared).

B_Group	An indicator of the firm's business group affiliation.
CSR	An indicator of the firm's adoption of corporate social responsibility.
ExAnteValueGain	The ratio of total asset value in accordance with IFRS to total asset value in accordance with Israeli GAAP, in the year preceding IFRS adoption.
DR	An indicator of a future debt restructuring.
PostIFRS	An indicator of post-IFRS years

[a] Expected default frequencies, bond yield spreads, and bond ratings are based on their average values over the year. Inferences remain the same when using the values as of the end of the year

[b] We use the firms' credit ratings according to either or both active rating agencies in Israel: Maalot and Midroog. We convert Maalot's and Midroog's rating symbols to an ordinal scale by assigning a value of 1 to the highest rating, 2 to the second-highest rating, etc. In cases where a bond was rated by both agencies in the same year, we average the ratings issued by Maalot and by Midroog to obtain the average firm-year rating. If the firm has several series of bonds, we determine the rating variable for this firm by the market-value-weighted average of the ratings of the different bonds

[c] See also *Dividend /total earnings* above

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