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Dividends from Unrealized Earnings and Default Risk[1]

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דיווידנדים מרווחים בלתי ממומשים והסיכון לחדלות פירעון

אילנית גביוס, אסתר חן ונדב שטינברג

תקציר

מחקר זה עוסק בהיתר להכיר ברווחים בלתי ממומשים שנובעים משערוך לפי השווי ההוגן – נדבך מרכזי של התקן הבין-לאומי לדיווח כספי (IFRS) – והוא מתמקד בסוגיה שטרם נחקרה: האם חלוקת דיווידנדים מתוך רווחים אלה משפיעה על הסיכון של פירמה להיקלע לחדלות פירעון? כדי לבחון זאת אספנו ידנית נתונים על הרווחים הבלתי ממומשים ועל הסדרי החוב של פירמות ישראליות לאחר אימוץ ה-IFRS, ומצאנו כי החלוקה הנידונה מגדילה משמעותית – פי שלושה – את הסיכון של פירמה להיקלע לחדלות פירעון. אף על פי כן דומה כי הסיכון המוגבר אינו מתומחר נכונה בשוק: עלות החוב של פירמות שחילקו דיווידנדים מרווחים בלתי ממומשים אינה שונה מהותית מזו של פירמות שלא עשו זאת מעולם.

Dividends from Unrealized Earnings and Default Risk

Ester Chen, Ilanit Gavious, and Nadav Steinberg

Abstract

Using hand-collected data on Israeli firms' unrealized earnings and debt restructurings following adoption of the IFRS, we investigate whether and how dividend payments based on unrealized revaluation earnings affect a firm's default risk. Our results indicate that in the era of fair value accounting, the origin of the dividend payout—coming from unrealized versus 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 (originating from either realized or unrealized earnings), companies are over three times more likely to subsequently require debt restructuring if they distribute dividends based on *un*realized earnings. However, this enhanced risk seems to be mispriced by the market; firms that distribute dividends based on unrealized earnings exhibit an insignificantly different cost of debt than firms that never do so.

Keywords: cost of debt, default risk, dividends, fair value accounting

***JEL Descriptors*:** M21; M41; G35

1. Introduction

In the era of fair value accounting, firms can recognize unrealized earnings arising from changes in the fair values of assets and liabilities in their income statements. This ability has provoked debate about the possible improper use of these earnings for private benefits that conflict with the interests of other stakeholders in the firm. Studies examining firms' reported earnings following the adoption of fair value accounting rules have generally focused on the extent to which they represent real economic earnings rather than managed earnings.[1] In this study, however, we explore a hitherto unexamined aspect of the ability to recognize unrealized earnings: the effect of distributing dividends to shareholders based on these earnings *before they are realized* on the firm's default risk. Studies examining the effects of dividend payouts usually focus on the extent of the dividend payments (either the levels of, or the changes in, dividend payments), rather than on the origins of the dividend, meaning the type of earnings underlying the dividend payout. This study turns the spotlight from the extent of the payout to its origin and distinguishes between unrealized and realized earnings.

The overall effect of dividend payouts on a firm's default risk, and thus on its cost of debt, is unpredictable. This is due to the opposing implications for debtholders of two important hypotheses in the dividend literature: the wealth redistribution between shareholders and debtholders hypothesis and the information content of dividends hypothesis. According to the wealth redistribution hypothesis, the payout of dividends transfers wealth from debtholders to shareholders thereby placing the former at greater risk. From the debtholders' perspective, dividends paid to shareholders reduce the firm's value, thereby increasing the value of the implicit put option and the probability of default (e.g., Black and Cox 1976; Kalay 1982; Galai and Wiener 2015). This conflict of

[1] See, for example, Van Tendeloo and Vanstraelen (2005); Barth et al. (2008); Jeanjean and Stolowy (2008); Capkun et al. (2012); Ahmed et al. (2013).

interests is exacerbated if the payouts are based on unrealized earnings, because the latter may 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 non-cash* items, basing the former on the latter may place the firm's debtholders at greater risk, over and above the potential risk associated with the extent of the payout. On the other hand, the information content hypothesis suggests that the distribution of dividends conveys information about the firm's current/future cash flows (e.g., Bhattacharya 1979; Miller and Rock 1985; Baker and Wurgler 2004; DeAngelo and DeAngelo 2006; Guttman et al. 2010; Lambrecht and Myers 2012). Specifically, it signals stronger earnings power for the firm and thus less financial risk. Thus far, the literature provides inconclusive evidence about the overall implications of the wealth redistribution and the information content of dividends hypotheses for debtholders (Handjinicolaou and Kalay 1984; Dhillon and Johnson 1994).

We explore the effect of dividends based on unrealized earnings (hereafter DBU) on the 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 sample firms constant, thereby avoiding the onerous need to control for these factors that arises in typical cross-country studies. Note that using an IFRS adopting country allows us to examine the research question in various industries. Unlike US GAAP that permits the measurement of financial instruments only at fair value and thus affects mainly financial firms,[2] IFRS allows the measurement of various financial statement items such

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

as financial instruments, investment property, investment in subsidiaries and investment in associates and joint ventures at fair value[3].[4]

Our sample comprises Israeli public companies that adopted the IFRS in 2007.[5] As in many IFRS adopting countries, the Corporate Law in Israel that 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 based on unrealized earnings (henceforth DBU firms) using a classification scheme consistent with Chen and Gavious (2016). This scheme consists of a set of stringent cumulative conditions that a firm must meet to be classified as DBU. Specifically, a firm is classified as DBU only if it has paid dividends in amounts that exceed *all of* its distributable *realized* earnings. Thus, the assumption underlying the classification as DBU versus non-DBU firms is that all realized earnings are distributed before any unrealized earnings are distributed. Applying such rigorous conditions is essential in our study in order to maximize the likelihood that our determination about whether or not the firm has distributed dividends based on unrealized earnings is correct.[7] To determine the DBU classification and conduct the various empirical analyses, we hand-collected all of the information about the sample firms' unrealized revaluation earnings from their annual

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[3] IAS No. 39 *Financial Instruments: Recognition and Measurement* (as revised in 2005), to be 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 11 *Joint Arrangements* (2011).

[4] Given the different reporting incentives, accounting requirements and regulatory requirements of financial firms compared to other industries, generalizing results based on a sample of financial firms only may be problematic.

[5] Prior to the 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] Sections 302-3 of Israeli Corporate Law. Later on, we provide specific examples of countries in which the IFRS amounts do not have to be modified to determine distributable profits.

[7] Given that the DBU classification is a key factor in this study, it is important to note that our results are robust to applying alternative classification schemes, as we will demonstrate in numerous robustness tests.

financial statements.[8] In addition, we obtained access to the Bank of Israel's manually collected corporate defaults database, which includes detailed information about firms that have gone through debt restructuring since 2008. Overall, our sample consists of 292 firms (2,652 pre- and post-IFRS firm-years) with tradable debt (bonds), of which 94 firms went through 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 DBU firm paid dividends based on unrealized gains two to three times during the sample's 6-year post-IFRS period. Of these firms, 39 percent defaulted on their debt and entered a debt restructuring process, usually two to three years after the payment of DBU. In contrast, only 24 percent of the non-DBU firms required debt restructuring. Notably, none of the latter paid dividends throughout the sample period. Stated differently, neither one of the non-DBU firms that paid dividends has needed debt restructuring. This result is consistent with the payment of dividends based on realized earnings, signaling a firm's financial solidity. Nevertheless, this does not seem to be the case 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 DBU and default risk. Specifically, the evidence shows that, ceteris paribus, the probability of requiring debt restructuring is more than three times higher for a DBU firm compared to a non-DBU firm. Moreover, the dividend payout variable that captures the extent of the payment is insignificant in all model specifications. This result suggests that rather than the extent of the dividend payout, it is the type of earnings underlying the payout—unrealized as opposed to realized—that significantly and positively affects the firm's default risk. Our inferences

[8] This information does not appear on electronic databases such as *Compustat.*

are robust to controlling for endogeneity possibly resulting from firms with a greater likelihood of encountering financial distress choosing to distribute dividends based on unrealized earnings as well as for other confounding factors.

The results of the survival analysis reveal that the distribution of unrealized earnings does not signal a firm's solidity. Rather, it leaves the firm with insufficient sources and with a greater probability of a looming default, consistent with the wealth redistribution hypothesis. Nevertheless, an analysis of the cost of debt shows that the documented increased default risk of DBU is *not* priced in these firms' cost of debt. We find that, after partialling out the impact of various variables documented in prior literature as having a potential effect on a firm's financial risk (including the extent of the dividend payment), and controlling for possible endogeneity effects, the cost of debt for a DBU firm, proxied either by bond yield spreads or by bond ratings, is insignificantly different from the cost of debt for a non-DBU firm. This finding implies that the distribution of unrealized earnings *falsely* signals financial solidity to the market, resulting in the increased default risk being mispriced. While in general the bond market is efficient in distinguishing financially healthy firms from default-prone ones, in the case of dividend distributions based on unrealized earnings, the evidence suggests that the signaling equilibrium is disrupted. In other words, the distributions are *not* as (fully) revealing as would have been the case in equilibrium.

We conducted various robustness tests and sensitivity analyses including using alternative procedures to identify dividend distributions based on unrealized earnings and to examine the generalizability of our results to different industries and different states of the economy. The findings substantiate the robustness of our 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.[9] 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 US, 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 of corporate laws, 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 US.

The remainder of the paper is organized as follows. In the next section we review the relevant literature and develop 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. A series of robustness tests and sensitivity analyses appear in Section 5. Section 6 concludes.

2. Literature review and development of hypotheses

The extant dividend literature suggests that firms seek to smooth their dividend payments and maintain a relatively stable dividend payout policy (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 are willing to go to great lengths including selling assets, laying off employees, raising external financing and skipping profitable projects to avoid dividend cuts. Furthermore, companies use dividends for signaling (e.g., Bhattacharya 1979; John and Williams 1985; Miller and

[9] See, for example, KPMG Feasibility Study of Capital Maintenance – Main Report. http://ec.europa.eu/internal_market/company/docs/capital/feasbility/study_en.pdf

Rock 1985; DeAngelo et al. 2000; Baker and Wurgler 2004; DeAngelo and DeAngelo 2006; Guttman et al. 2010; Lambrecht and Myers 2012). Notably, all of these studies 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, what 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 the dividend literature suggesting 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 were not allowed to be included in the firms' income statements according to the previous accounting rules, the amount a firm's 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 recognition of revaluation gains, cash dividends need to increase as well if the firm wants the payout to earnings ratio to remain stable (or not decrease). Studies document increases in reported earnings in various IFRS adopting countries compared to the pre-IFRS period (e.g., Jeanjean and Stolowy 2008; Capkun et al. 2012; Ahmed et al. 2013; Chen and Gavious 2016). However most of these studies do not deal specifically with unrealized revaluation gains. The study of Chen and Gavious (2016) is an exception in categorizing post-IFRS earnings into realized and unrealized earnings. Importantly, they show that recognition of unrealized revaluation profits in the post-IFRS period leads to increases in the amount dividend payments.

Moreover, they document aggressive upward earnings management in the financial statements of the DBU firms. No evidence for such aggressive reporting behavior was observed in non-DBU firms, suggesting that revaluation earnings may have been inflated to allow dividend distributions. Our study takes the examination of this important issue to the next level, exploring the consequences of such behavior for the firm and its debtholders.

The consequences of DBU are unpredictable due to the opposing implications for debtholders of two hypotheses in the dividend literature: the wealth redistribution hypothesis and the information content hypothesis. In accordance with the wealth redistribution hypothesis, when dividends are paid to shareholders, there is a transfer of wealth from debtholders to shareholders, thereby increasing the risk of the outstanding debt. This hypothesis, which stems from the conflict of interests between debtholders and shareholders, predicts that given greater information uncertainty, debtholders will price protect themselves by requiring a higher cost of debt. On the other hand, the information content hypothesis suggests that dividend distributions convey information about the firm's ability to generate future cash flows. As a signal of a firm's financial solidity, the distribution of dividends may lead to a reduction in the cost of debt.

The literature provides inconclusive evidence about the overall implications of the wealth redistribution and the information content of dividends hypotheses, which imply 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, both effects occur concomitantly and can either outweigh or offset one another.[10]

[10] 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, but which "…does not rule out the information content hypothesis." (p. 281).

In our setting, the opposing effects of the two hypotheses stand in even sharper contrast. On the one hand, the uncertainty with regard to whether or not 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 future prospects. In particular, it makes it harder for them to form an acceptable range of probabilities about the likelihood of a default. Thus, in line with the wealth redistribution hypothesis, DBU firms will be more likely to default on their debt and thus will exhibit a higher cost of debt than non-DBU firms. On the other hand, applying the information content hypothesis to dividends originating from unrealized earnings predicts that DBU 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. Hence, the required cost of debt for a DBU firm will be lower than the cost of debt required from a ceteris paribus similar non-DBU firm. Therefore, we frame our hypotheses in the null form:

> Hypothesis 1. *Ceteris paribus, 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.*

> Hypothesis 2. *Ceteris paribus, a firm that distributes dividends based on unrealized earnings does not differ in its cost of debt from a firm that does not distribute earnings based on unrealized earnings.*

3. Sample selection and data

3.1. Sample selection

Our sample selection procedure begins with all 623 Israeli public companies listed on the Tel Aviv Stock Exchange (TASE) from 2007 and up until 2013.[11] We excluded financial firms from the analyses, because they were not required to adopt IFRS. This elimination resulted in a loss of 29 of the 623 companies. Additionally, we removed another 41 companies, because they were dually listed on the TASE as well as on the US stock exchanges. Therefore, they were fully compliant with US GAAP and not required to adopt IFRS.[12] Finally, we excluded firms for which data were missing as well as firms with no tradable debt (bonds).[13] This elimination resulted in a loss 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 2,652 observations: 876 pre-IFRS and 1,776 post-IFRS firm-years. In the analyses, we deal with outliers by winsorizing extreme values (top and bottom 1 percent) of continuous variables. We winsorize rather than cut the extreme values to conserve data.

[11] Though IFRS was formally adopted in 2008, almost all Israeli public companies voluntarily adopted IFRS in 2007. A minority of public firms adopted IFRS as early as 2006, a variation that we will use later on in this paper.

[12] Recall that the US GAAP rule that allows the measurement of financial instruments only at fair value affects financial firms in particular, 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).

[13] Firms with no tradable debt are excluded from the sample, because there is no documentation about whether or not these firms defaulted on their (non-public) debt.

TABLE 1: Sample selection procedure

Israeli public companies listed on the TASE 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 and/or with insufficient information for the analyses	261
Final firm sample	292

3.2. Data

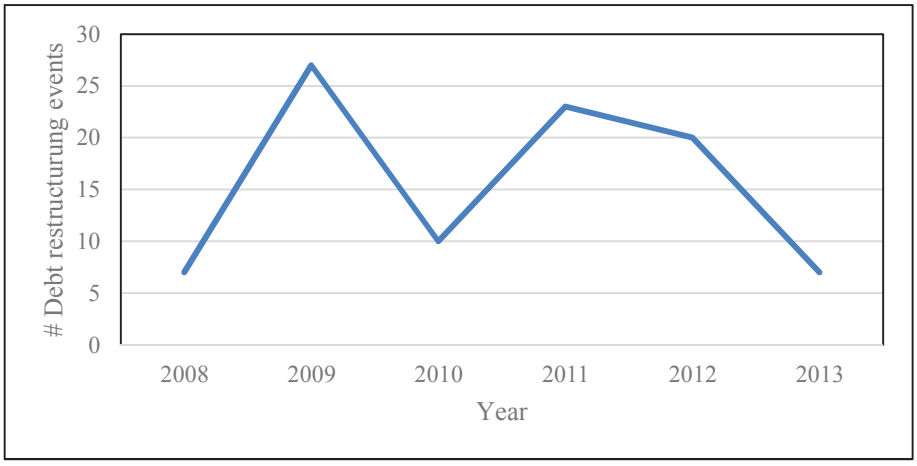
We obtained the financial information for our sample from the *Bloomberg Professional* database. We supplemented this data with information collected manually from the companies' financial statements as well as from the Bank of Israel. The manually collected data include unrealized earnings arising from the fair value measurement of financial instruments, investment property, investment in subsidiaries and investment in associates and joint ventures, as per IFRS rules. To obtain information about default events, we gained access to the Bank of Israel's corporate defaults database.[14] The firms included in this database are those that issued bonds in the past (either straight and/or convertible bonds) and subsequently entered a debt restructuring process.[15] Of the 292 firms in our sample, 94 firms went through debt restructuring at least once during the sample period. Specifically, 82 firms went through debt

[14] As of 2008 the Bank of Israel began recording all of the public debt restructuring events in Israel. It is important to 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 appear prior to 2008.

[15] A firm enters a debt restructuring process once it has: 1) announced to its bondholders that it will not be able to pay its debt as outlined in the terms of the bond, and/or 2) once the firm has not paid the debt as per the terms of the bond and/or 3) once a court has determined that the firm will not be able to repay its debt to the bondholders as per the terms of the bond. The date of entering a debt restructuring process is the earliest of the dates of the above three events.

restructuring once, 11 firms went through debt restructuring twice and one firm did so three times. Figure 1 depicts the occurrences of debt restructurings by year.

Figure 1: Debt restructuring events by year



We also used the Bank of Israel 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. We used the firms' credit ratings according to the rating agencies active in Israel—'Maalot' (a fully owned subsidiary of the Standard and Poor's rating agency) and 'Midroog' [a partially owned (51 percent) subsidiary of the Moody's rating agency]—to determine the firms' credit ratings. Generally, a bond is rated by one of the two rating agencies. In cases where a bond was rated by both agencies in the same year, we averaged the ratings in order to get the average firm-year rating. We point out that the same inferences are obtained if instead of using the average we take the most recent rating of those issued by the two rating agencies. 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 are similar if we use 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.

3.3. Identifying DBU firms

Chen and Gavious (2016) propose two procedures according to which firms can be identified as DBU.[16] We conduct our analyses using both procedures proposed to identify DBU firms and obtain similar qualitative results. For parsimony, we tabulate and interpret the results obtained from the procedure that is based on more stringent requirements to be classified as a DBU firm.[17] According to this procedure, in order for a firm to be classified as DBU, it has to pay dividends in amounts that exceed all of its distributable *realized* earnings. Stated differently, the assumption underlying the classification as DBU versus non-DBU firms is that all realized earnings are distributed before any unrealized earnings are distributed. The procedure is as follows:

a. For each firm-year, classify net income into "realized" and "unrealized" categories.
b. Identify the firm-years in which dividends were distributed to shareholders.
c. Compare the amount of dividends distributed in each year identified with the distributing firm's accumulated *realized* earnings not distributed thus far.
d. If the amount of dividends paid is greater than these earnings, but the difference is smaller or equal to the firm's *unrealized* earnings recognized (but not distributed thus far), infer that the dividends were distributed based on unrealized earnings. Otherwise, surmise that the firm did not distribute dividends based on unrealized earnings.

[16] Note that Chen and Gavious (2016) refer to these firms as DFU, an acronym for dividends from unrealized earnings.
[17] The description and results of the alternative procedure are presented in Section 5: Robustness Tests.

Based on the procedure described above, 75 firms (26 percent) in our sample distributed dividends based on unrealized gains at least once during the sample period. On average, each of these 75 DBU firms paid dividends based on unrealized gains two to three times (2.49) during the sample's 6-year period. Of these DBU firms, 29 (39 percent) encountered financial distress and entered a debt restructuring process, usually two to three years after the payment of dividends based on unrealized earnings (25 DBU firms entered a debt restructuring process once, and 4 did so twice). Note that 2-year lagged DBU makes the greatest contribution to the explanation of entering debt restructuring, followed by 3-year lagged DBU. In other words, DBU is more likely to lead to debt restructuring two or three years later than one year later. This finding suggests that firms on the verge of default are leery of distributing such dividends, perhaps for fear of legal action. It is also important to note that none of the DBU firms entered debt restructuring before the first payment of dividends from unrealized earnings. Markedly, in contrast to DBU firms, none of the non-DBU firms that paid dividends ever required debt restructuring during the sample period. We point out that the 65 non-DBU firms that did need debt restructuring never paid dividends throughout the sample period. Hence, in contrast to DBU firms, the financial distress of the non-DBU defaulting firms cannot be associated with dividend distributions in general and with distributing dividends based on unrealized earnings in particular.[18]

We categorize a firm as DBU from the first year it paid dividends based on unrealized earnings and thereafter. In other words, for each firm, the indicator variable *DBU* receives the value of 1 in the year the firm first distributed dividends based on unrealized earnings *and up until the last sample year*, resulting in 382 (1,394) (non-)DBU firm-year observations. For robustness we repeat the analyses where, instead of

[18] It is important to note that the results of our study are robust to excluding firms that never paid dividends throughout the sample period.

coding a firm as DBU from the year it first distributed dividends based on unrealized earnings and henceforth, we code it as DBU for the entire sample period (even before the first payment from unrealized earnings). In addition, we repeat the analyses using a *firm-year* based coding rather than a *firm-based* coding of DBU. In other words, DBU receives the value of 1 only for the firm-years in which dividends were distributed based on unrealized earnings. Whereas a firm-based coding of DBU puts the focus on the characteristics of the firms that tend to utilize the recognition of unrealized earnings to increase dividend payments, a firm-year-based coding of DBU puts the focus on the incidence of dividend payments out of unrealized earnings. Importantly, our results are robust to using any of the three approaches (defining a firm as DBU only from the point at which it began paying dividends based on unrealized earnings and thereafter; only in the years of payment; or throughout the sample period).

Table 2, Panel A displays the industrial affiliation of our sample firms by DBU versus non-DBU companies, as well as by whether or not the firm entered debt restructuring during the sample period. The results show that real estate firms are the most common DBU companies and also the highest percentage of debt restructuring firms (63 percent and 61 percent, respectively). In contrast, high-technology firms are the least common in both groups (3 percent and 2 percent, respectively). A possible explanation for the prevalence of real estate firms in the DBU group is that IAS 40 *Investment Property*, which allows the recognition of unrealized earnings arising 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 value, IAS 40 strongly affects these firms' financial reporting. Nevertheless, it should be noted that the occurrence of debt restructurings amongst the real estate DBU firms is similar to that in DBU firms from other industries (about 40 percent). 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.

TABLE 2: Summary statistics

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 (1,776 firm-years). Of the 292 firms, 75 firms distributed dividends based on unrealized earnings [DBU] at least once during the post-IFRS period, and 217 firms never did so (in all, 457 DBU and 1,319 non-DBU firm-years). Of the DBU firms, 29 engaged in debt restructuring at least once (33 occurrences) following the distribution of dividends based on unrealized earnings, whereas none of the non-DBU firms that distributed dividends did so (the 65 non-DBU firms that did require debt restructuring did not pay dividends throughout the sample period). Asterisks in Panel B indicate that the value for non-DBU firms is significantly different than the corresponding value for DBU firms. ***, **, and * denote significance at the 1 percent, 5 percent and 10 percent (two-tailed) levels, respectively.

Panel A: Industry affiliation by DBU and by default

	No. of firms (%)				
	Pooled	**DBU firms**	**Non-DBU 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 industrial 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

	DBU firms			Non-DBU firms		
Variable	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
Total Assets ($ millions)	1,634	383	3,254	861***	126***	2,117
ROA_realized	0.05	0.03	0.25	0.04	0.03	0.21
Unrealized ROA- Total	0.09	0.02	0.17	0.01***	0.00***	0.16
Unrealized ROA from revaluation of:						
Financial instruments	0.01	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	0.04	0.01	0.17	0.01*	0.00*	0.07
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	0.94	0.82	0.80	0.93	0.79***	0.88
Altman's Z-score	0.69	0.66	1.50	0.93**	0.93***	3.49
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

Definition of Variables: *Total Assets* is total assets in the firms' balance sheets in $millions. *ROA_realized* is net income minus total unrealized earnings (net of taxes), scaled by lagged total assets. *Unrealized ROA-Total* is the 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 financial instruments* and from *investment property* is unrealized earnings (scaled by lagged total assets) arising from changes in the fair values of financial instruments (as per IAS 39) and of investment property (as per IAS 40), respectively. *Unrealized ROA from revaluation of investment in other entities* is unrealized earnings (scaled by lagged total assets) arising from changes in the fair values of investment in subsidiaries (as per IAS 27) as well as of investment in associates and joint ventures and joint arrangements (as per IAS 28 and IFRS 11). *Dividend /total earnings* is 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* is the total cash dividend divided by realized earnings, where realized earnings is net income minus total unrealized earnings (net of taxes). *Current ratio* is current assets divided by current liabilities. *Interest coverage* is the ratio of operating profits to interest expense. *Leverage* is total debt divided by total assets. *Altman's Z-score* is a measure for predicting bankruptcy as per Altman *et al.* (1998). *Yield Spread* is the basis point spread between the firm's bonds' (market value) weighted yield and a government bond with comparable duration and indexation characteristics to proxy for the firm's cost of debt. *Rating* is the firm's bond rating specified as a continuous variable. Specifically, 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, etcetera. We use the firms' credit ratings according to either or both active rating agencies in Israel: Maalot and Midroog. 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. The yield spreads and the bond ratings are based on their average values over the year. Inferences remain the same when using the values as of end-of-year.

4. Tests and results

4.1. Univariate analyses

Table 2, Panel B presents the descriptive statistics of selected financial information for the DBU and non-DBU firms in our sample separately. Importantly, both the DBU and non-DBU sample firms operate in the same legal and economic environment, two major factors essential for comparing these two groups in the context of our study. A comparison between the two groups shows that DBU firms are significantly larger than non-DBU firms (mean total assets of $1,634 million versus $861 million, respectively). Whereas realized earnings are similar in DBU and non-DBU firms (4-5 percent of total assets, on average), unrealized earnings are significantly higher in DBU firms (9 percent versus 1 percent for non-DBU firm-years; p-value < 0.01). The dividend payout ratio, calculated as cash dividends divided by total earnings—realized plus unrealized earnings—is also significantly higher in DBU firms (52 percent compared with 26 percent in non-DBU firms; p-value < 0.01). When taken from realized earnings only, the gap between the payout ratios of DBU firms and non-DBU firms is even more pronounced (134 percent versus 32 percent). The over 100 percent payout ratio from realized earnings in DBU firms reflects the fact that the firms distributed all of their realized earnings and then some, based on unrealized earnings, consistent with our DBU definition. Note that, for (non-)DBU 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—DBU and non-DBU—prior to IFRS adoption (not tabulated for parsimony), we find no difference (about 34 percent on average for both groups). Notably, while DBU firms significantly increased their payout ratios compared to the levels that existed in the pre-IFRS period (at the 1 percent significance level), the ratios for non-DBU firms remained similar in

both sub-periods. Moreover, the increase in the DBU firms' payout ratio is so marked—from 34 percent to 134 percent of realized earnings on average—that it signals an obvious change in dividend policy in these firms.[19] Taken together, the findings above strengthen our confidence that the classification of DBU versus non-DBU among our sample firms is correct.

Liquidity, proxied either by the current ratio (current assets divided by current liabilities) or by interest coverage (the ratio of operation profits to interest expenses), is lower in DBU firms. These firms also demonstrate greater financial risk, as evident in their significantly higher degrees of leverage as well as lower Altman Z-scores.[20] Nevertheless, despite these differences, the cost of debt in DBU firms is insignificantly different than that in non-DBU firms according to both the bond yield spreads and bond ratings.[21] Recall that DBU firms have more debt restructuring events (Section 3). Untabulated comparisons of the cost of debt of DBU versus non-DBU firms by whether or not they required debt restructuring during the sample period show that, as expected, this cost is significantly higher for the firms that needed debt restructuring, within the DBU as well as the non-DBU group. Specifically, on average (median), bond yield spreads are around 40 percent (27) [6 percent (4)] in firms that required [did not require] debt restructuring, regardless of whether they are DBU or non-DBU. Similar inferences are obtained for bond ratings. However, there is no significant difference between the cost of debt of DBU and non-DBU firms within the firms that required debt restructuring

[19] On the face of it, DBU firms could double or triple the dividend payout ratio using their 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 DBU is beyond its scope.

[20] We use Z-scores based on Altman, Hartzell and Peck (1998). Our results are robust to using either Z-scores based on Altman (1968) or Z-scores adjusted for Israeli companies (Ingbar 1994).

[21] 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, etcetera.

nor within those that never did. These findings are important because they suggest that the insignificant differences in the costs of debt of DBU and non-DBU 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 DBU firms are more likely than non-DBU firms to encounter financial distress and default on their debt. Nevertheless, there is no evidence of a higher cost of debt for DBU firms. In what follows, we supplement the univariate analysis with a set of multivariate analyses estimating the *direct* association between DBU and 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 DBU and default risk in the period following the adoption of IFRS using a Cox proportional hazard model (Cox 1972).[22] In this model, the hazard is assumed to be

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

where $h_0(t)$ is the baseline hazard at time t—the risk of debt restructure, given that all of the firm characteristics at time t equal 0. Note that this hazard function takes into account the time spent by firms (number of years) up until they enter a debt restructuring

[22] 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, entering 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.

process.[23] $\boldsymbol{\alpha}$ is a vector of parameters to be estimated. $\boldsymbol{X}$ is a vector of firm variables at time t affecting its risk of default. Specifically, in our main specification, $\boldsymbol{X}$ is a vector of

{*DBU, DivPayout, Size, ROA_Real, LossReal, ROA_Unreal, LossUnreal, Leverage, InterestCoverage, CurrentRatio, Tangibility, Maturity*}[24]

DBU is our indicator variable for a firm that distributed dividends based on its unrealized earnings. *DivPayout* is cash dividend payouts divided by realized earnings. We take the payout ratio from realized earnings, because it captures the excess dividend payouts better, given the firm's level of realized earnings, if such took place. Nevertheless, results are robust to using either the dividend payout ratio from total earnings or from realized earnings only. Whereas the coefficient on *DBU* captures the difference between DBU and non-DBU firms in the likelihood of a default, the coefficient on *DivPayout* captures the impact of the *extent* of dividends (originating from either realized or unrealized earnings) paid, after controlling for the DBU classification.[25] *Size* is the natural logarithm of total assets. *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

[23] 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 process. If a firm entered a debt restructuring process more than once during the sample period, the count of years is up until the first debt-restructuring event.

[24] We point out that we also examined specifications with capital expenditures as a proxy for the firm's investment strategy. Supposedly, 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 thus dividends) and default risk. In our sample, however, the levels of a firm's capital expenditures decreased (on average and median) in the post-IFRS period for both DBU and non-DBU firms (not tabulated 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 the model (1).

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

total assets (*ROA_Unreal*) in the regressions.[26] Consistent with Dichev and Skinner (2002), we also include loss indicators. *Loss_Real* (*Unreal*) equals 1 if *ROA_Real* (*Unreal*) is negative, 0 otherwise. *Tangibility* is the proportion of fixed assets to total assets, a proxy for information asymmetries (see, e.g., Hadlock and James 2002; Denis and Mihov 2003; Bharath et al. 2008)[27] and *Maturity* is the weighted average of the duration of all of the firm's traded bonds. *Leverage, Interest Coverage* and *Current Ratio* are as defined above.[28] In our regressions we control for industry fixed effects (controlling for year fixed-effects is redundant in a Cox proportional hazard model that, by its 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 and decrease with its size, profitability, liquidity (proxied by interest coverage and current ratio), tangibility, and bond maturity. Note that the Cox model provides estimates of the parameters vector $\boldsymbol{\alpha}$ but provides no direct estimate of the baseline hazard $h_0(t)$.

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

$$\{DBU, DivPayout, Size, Zscore, Maturity\}$$

[26] We do not form a prediction as to whether the association between earnings and the probability of a default differs for realized and unrealized earnings.

[27] Another control for information asymmetry costs as well as for growth opportunities used in previous studies is the market-to-book ratio (e.g., Krishnaswami et al. 1999; Hadlock and James 2002). In our analyses, the market-to-book ratio is consistently insignificant in explaining firms' default risk and their cost of debt. Its inclusion in the models does not alter the qualitative results.

[28] 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 of these variables or both.

The estimation results of the model with the explanatory variables in ***X*** and ***X**** are displayed in Table 3, columns (1) and (2), respectively. According to both specifications, as the highly significant positive coefficient on the *DBU* indicator variable indicates, DBU firms are more likely to need debt restructuring. We point out that the inclusion of the *DBU* variable improves the model's explanatory power substantially. The pseudo R^2 of the model increases by about 50 percent when *DBU* is added to the specification. In terms of the hazard ratio, the coefficients on *DBU* in columns (1) and (2) are 3.177 and 3.128, respectively. The coefficient on *DBU* in terms of the hazard ratio allows us to interpret the results of the survival analysis in economic terms: the probability of a DBU firm requiring debt restructuring is about three times higher than that of a ceteris paribus similar non-DBU firm.

The coefficient on *DivPayout* is insignificantly negative in both specifications. 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 *DBU* 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.[29] The coefficient on *Loss_Real* is significantly positive, as

[29] Interestingly, leverage does not contribute significantly to the explanation of the likelihood of needing debt restructuring over and above the impact of distributing dividends based on unrealized earnings, size, profitability, liquidity or bond maturity. The coefficient on *Leverage* in the default regressions remains insignificant even if we exclude the other accounting items from the equation (*ROA*, *Loss*, *Current Ratio*, *Interest Coverage* and *Tangibility*). Nevertheless, the coefficient on *DBU* 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 between leverage and both bond ratings and yield spreads.

TABLE 3: Default regressions

Table 3 presents the estimation results of a survival analysis using a Cox proportional hazard model (Cox 1972). The independent variables are as follows: *DBU* is a dummy variable that equals 1 for a firm that distributed dividends based on its unrealized earnings and 0 otherwise; *DivPayout* is cash dividend payouts divided by realized earnings; *Size* is the natural logarithm of total assets; *ROA_Real* (*Unreal*) is the firm's (un)realized earnings divided by total assets; *Loss_Real* (*Unreal*) is a dummy variable that equals 1 if *ROA_Real* (*Unreal*) is negative, 0 otherwise; *Leverage* is total debt divided by total assets; *InterestCoverage* is the ratio of operating profits to interest expense; *CurrentRatio* is current assets divided by current liabilities; *Tangibility* is the proportion of fixed assets to total assets; *Maturity* is the weighted average of the duration of all of the firm's traded bonds. We repeat the analysis using Altman's Z-score measure interchangeably with the accounting variables. *Zscore* is Altman et al.'s (1998) Z-score measure. *Industry* is a dummy variable capturing the industry's fixed effects. 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 firms. Entries are coefficients; standard errors clustered at the firm level appear in parentheses. ***, ** and * indicate significance at the 1 percent, 5 percent and 10 percent (two-tailed) level, respectively.

TABLE 3 *continued*

	Pooled sample		**Propensity score-matched sample**	
	(1)	(2)	(3)	(4)
DBU	1.156***	1.141***	1.088**	1.042**
	(0.337)	(0.276)	(0.536)	(0.434)
DivPayout	-0.381	-0.598	-0.031	-0.300
	(0.292)	(0.369)	(0.184)	(0.210)
Size	-0.700**	-0.465***	-0.243	-0.266
	(0.317)	(0.174)	(0.501)	(0.210)
ROA_Real	-2.101**		-4.695***	
	(0.948)		(1.568)	
LossReal	1.277***		0.989	
	(0.447)		(0.697)	
ROA_Unreal	-4.479***		-7.363**	
	(1.686)		(3.624)	
LossUnreal	-0.785		-0.159	
	(0.533)		(0.722)	
Leverage	-0.079		0.149	
	(0.193)		(0.417)	
InterestCoverage	-0.001		-0.022	
	(0.004)		(0.018)	
CurrentRatio	-0.410***		-0.670**	
	(0.138)		(0.322)	
Tangibility	-1.497		-1.265	
	(0.990)		(1.561)	
Zscore		-0.034***		-0.252**
		(0.011)		(0.099)
Maturity	-0.356***	-0.515***	-0.614***	-0.677***
	(0.130)	(0.120)	(0.214)	(0.207)
Industry	Yes	Yes	Yes	Yes
Pseudo R^2	0.177	0.118	0.239	0.177
Likelihood ratio chi-squared	130.50 (*p*-value < 0.000)	116.60 (*p*-value < 0.000)	128.60 (*p*-value < 0.000)	72.39 (*p*-value < 0.000)
No. Obs.	1,032	1,172	383	458

expected. No such effect is found for unrealized loss (*Loss_Unreal*). The coefficient on Altman's Z-score measure (*Zscore*) in column (2) is significantly negative, consistent with lower Z-scores predicting a greater likelihood of looming financial distress.

Our main finding of a direct and positive link between DBU and the future risk of default gains further support from an analysis that examines the pattern of unrealized earnings over time. Untabulated results show (in)significant reversals in positive (negative) unrealized earnings over time. 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.

4.2.2. Controlling for endogeneity

In our setting, endogeneity results if firms that are more likely to encounter financial distress choose to distribute dividends based on unrealized earnings. More 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.[31] 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.

To control for endogeneity, we first account for the possibility that DBU 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 include the

[31] For example, according to Sections 302-3 of the Israeli Corporate Law, a firm can pay dividends out of the highest of (1) its retained earnings or (2) its earnings accumulated over the last two years, *conditional on the firm's ability to pay off all of its liabilities*.

ownership concentration and ownership concentration squared (in accordance with Morck et al. 1988), an indicator of the firm's business group affiliation[32] and an indicator for the firm's adoption of corporate social responsibility[33] interchangeably in the survival analyses. Untabulated results indicate that neither of these variables has an incremental impact on default risk after controlling for *DBU* and the other determinants of financial risk. Importantly, the coefficient on *DBU* (as well as on the other controls) remains qualitatively similar with these variables included in the model, hence relaxing the concern that DBU may be merely standing in for intensified management agency conflicts and/or compromised corporate governance.

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

$$DBU_i = \alpha_o + \alpha_1 DivPayout_i + \alpha_2 Leverage_i + \alpha_3 Size_i + \alpha_4 EarlyAdopt_i + \varepsilon_i \quad (2)$$

[32] 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.

[33] We obtain information about firms adopting a corporate social responsibility (CSR) policy from the annual "Maala Ranking of Corporate Social Responsibility" reports for the sample years. The Maala ranking includes categories of business ethics, corporate governance, and management and reporting (as well as of community relations, working environment, environmental protection).
http://maala.org.il/he/company/ranking/faq/Default.aspx?ContentID=168

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.[34] The dependent variable, our *DBU* indicator, is regressed on a set of variables deemed to affect both financial distress and the decision to pay dividends based on unrealized earnings, as well as on an additional instrumental variable (IV). Specifically, we include *DivPayout* and *Leverage*, both proxies for debtholder-shareholder conflicts over dividend policy (see, 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. The IV in our probit model is a dummy variable for the early adoption of IFRS (*EarlyAdopt*). In 2006, 45 firms in Israel voluntarily adopted IFRS before all the other public firms did.[35] Hence, early adaptors were able to recognize revaluation gains before other firms were able to do so and thus were potentially able to distribute dividends based on these gains before other firms.

Table 4 provides the results of the DBU probit model (2). The results indicate that the likelihood that the firm will distribute dividends based on unrealized earnings increases significantly with the size of the company. In addition, as expected, this likelihood increases significantly if the firm was an early adopter of IFRS. Both firm size and early adoption of IFRS are strongly associated (p-value < 1%) with DBU.

[34] Note that the estimation of the probit model for predicting DBU is based on all of the Israeli non-financial and non-dually listed public companies on the TASE, and is not restricted to firms with traded bonds. Nevertheless, the results are qualitatively the same when firms with traded bonds only are used. The number of firms with sufficient data required for estimating our DBU probit model is 426. Furthermore, note too that we use the average values (from 2004-2006) 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 remained unchanged.

[35] 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.

TABLE 4: Probit DBU model

This table presents the first stage results for the propensity score matching, using a probit model. The dependent variable *DBU* is a dummy variable that equals 1 for a firm that distributed dividends based on its unrealized earnings and 0 otherwise. *EarlyAdopt* is a dummy variable that equals 1 for firms that adopted IFRS in 2006 and 0 otherwise. All of the other variables are as defined in Table 3. Entries are coefficients; standard errors appear in parentheses. ***, ** and * indicate significance at the 1 percent, 5 percent and 10 percent (two-tailed) level, respectively.

Intercept	-2.208 (0.380)
DivPayout	-0.207 (0.168)
Leverage	0.012 (0.214)
Size	0.434*** (0.105)
EaelyAdopt	1.033*** (0.206)
Industry	Yes
Pseudo R^2	0.182
Likelihood ratio chi squared	71.53 (p-value < 0.000)
No. Obs.	426

Based on the results of the first-stage probit model, we match each DBU firm in our sample with a non-DBU firm with the closest likelihood of distributing dividends based on unrealized earnings using the Nearest Neighbor method (Deheja and Wahaba 1999). In the second stage, we estimate our Cox proportional hazard model using the propensity matched sub-sample. The results presented in Table 3, columns (3) and (4), show that *DBU* is significantly and positively associated with the occurrence of debt restructuring in the propensity matched sub-sample, when using either $\boldsymbol{X}$ or $\boldsymbol{X^*}$ as the vector of explanatory variables. In terms of the hazard ratio, the coefficient on *DBU* using $\boldsymbol{X}$ ($\boldsymbol{X^*}$) is 3.463 (3.143), implying that the probability of a DBU firm needing debt restructuring is around three times higher than that of a ceteris paribus similar non-DBU firm—similar to the result obtained for the pooled sample. Hence, the increased risk of a default documented for DBU firms in this sub-section is over and above *ex ante* differences

between DBU and non-DBU firms. This result solidifies our conclusion 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 DBU firms.

Finally, we investigate the firms' propensity to default on their debt *prior* to the adoption of IFRS. Specifically, we are interested in whether the DBU sample firms might have been more likely than their matched non-DBU firms to default on their debt prior to IFRS, even without distributing dividends based on unrealized earnings.[36] Non-tabulated results show that the propensity to default for a DBU firm in the pre-IFRS period is similar to that of a matching non-DBU firm (p-value = 0.584). Determining that the DBU group of firms was *not* more likely to restructure their debt prior to IFRS, when the distribution of unrealized earnings did *not* take place, constitutes triangulating evidence in support of a direct link between the act of distributing dividends based on unrealized earnings and a greater likelihood of a subsequent default.

4.2.3. Cost of debt regressions

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

$$\begin{aligned} Cost\ of\ Debt_{i,t+1} = {} & \alpha_o + \alpha_1\, DBU_{it} + \alpha_2\, DivPayout_{it} + \alpha_3\, Size_{it} + \alpha_4\, ROA\_Real_{it} \\ & + \alpha_5\, LossReal_{it} + \alpha_6\, ROA\_Unreal_{it} + \alpha_7\, LossUnreal_{it} + \alpha_8\, Leverage_{it} \\ & + \alpha_9\, InterestCoverage_{it} + \alpha_{10}\, CurrentRatio_{it} + \alpha_{11}\, Tangibility_{it} \\ & + \alpha_{12}\, Maturity_{it} + \varepsilon_{i,t+1} \end{aligned} \tag{3}$$

[36] For each firm, we calculate the propensity to default in the pre-IFRS period using the coefficients from model (1), but excluding the *DBU* explanatory variable. 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.

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). The specifications of *Yield Spread* and *Rating* are as outlined above (Section 3). Note that we use yield spreads and bond ratings based on their average values over year *t+1* to capture the firm's cost of debt subsequent to the dividend payout (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. In the regressions, we control for firm and year fixed effects.[37]

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. The association between dividend payouts and the cost of debt is unexpected; it is either negative (according to the information content hypothesis), or positive (according to the wealth redistribution hypothesis) or insignificant (if the two effects offset one another). We expect greater profitability to be negatively related to the cost of debt. As in the default analysis, we do not form a prediction as to 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.[38] Higher interest coverage is expected to be associated with a lower cost of debt, because firms that generate more cash internally are in a better position to service their debts (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. As indicated above, a firm's tangibility controls for the borrowers' credit quality and probability of default as well as for information asymmetries and thus is expected to be

[37] 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).

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

negatively associated with the firm's cost of debt. Finally, yield spreads and ratings 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.[39] For each specification—*Yield Spread* and *Rating*—the left-hand column is based on the pooled sample, whereas the right-hand column is based on the propensity score-matched sample of firms. The coefficient on *DBU*, our main variable of interest, is insignificant in all of the specifications, indicating that the distribution of dividends based on unrealized earnings does not directly affect either bond ratings or yield spreads. All of the other control variables are generally with the expected sign and significance. We repeat all of the regressions with Altman's Z-score measure as an explanatory variable replacing the accounting variables (not tabulated for parsimony). The coefficient on *DBU* remains insignificant in all specifications. The coefficient on the Z-score is significantly negative, consistent with the assessment of analysts and investors that firms with higher Z-scores are less risky.

[39] Note that when the cost of debt is proxied by bond ratings, the estimations of (3) exclude non-rated 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. This variation, together with the robustness of the results to either using bond yield spreads or ratings as we will show later, allays the concern about the effect of a smaller sample size on the results of the *Rating* regressions. Note too that we repeated all of the analyses, including the debt restructuring analysis, using only firm-years for which we had *both* ratings and yield spreads (462 firm-years) [in other words, we used the same number of observations throughout the study]. The results obtained (untabulated for parsimony) are qualitatively similar to those when using all of the observations available for each regression separately (tabulated).

TABLE 5: Cost of debt regressions

Table 5 presents the results of the cost of debt fixed effects regression. Bond yield spreads (*Yield Spread*) and bond ratings (*Rating*) are used interchangeably to proxy for the firm's cost of debt. *Yield Spread* and *Rating* are as defined in Table 2. All of the other variables are as defined in Table 3. Entries are coefficients; standard errors clustered at the firm level appear in parentheses. 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 firms. ***, ** and * indicate significance at the 1 percent, 5 percent and 10 percent (two-tailed) level, respectively.

	Rating		***Yield spread***	
	Pooled sample (1)	**Propensity score-matched sample (2)**	**Pooled sample (3)**	**Propensity score-matched sample (4)**
Intercept	17.860***	24.260***	29.620*	116.800***
	(3.221)	(4.687)	(17.858)	(41.748)
DBU	-0.054	-0.624	4.338	0.883
	(0.465)	(0.580)	(4.005)	(6.733)
DivPayout	0.009	0.230	-1.602	-3.277
	(0.102)	(0.206)	(1.000)	(2.567)
Size	-5.691***	-6.836***	-6.151	-35.170**
	(1.299)	(1.538)	(7.416)	(16.081)
ROA_Real	-0.662	-3.514	-27.400*	-83.830*
	(1.264)	(2.394)	(16.064)	(45.350)
LossReal	0.446*	0.181	1.233	-0.468
	(0.262)	(0.380)	(1.811)	(4.913)
ROA_Unreal	-1.174	-4.065*	-27.740*	-104.600**
	(1.227)	(2.345)	(16.367)	(47.592)
LossUnreal	-0.154	-0.622	0.350	-1.067
	(0.274)	(0.909)	(2.166)	(7.847)
Leverage	6.470***	6.757**	11.120*	15.840*
	(2.005)	(3.287)	(7.080)	(10.276)
InterestCoverage	0.001	0.001	0.003	-0.020
	(0.001)	(0.004)	(0.013)	(0.031)
CurrentRatio	-0.200	-0.218	-0.713*	1.582
	(0.145)	(0.255)	(0.406)	(1.184)
Tangibility	-4.381***	-6.857**	-3.095	-29.510
	(1.363)	(3.287)	(11.762)	(30.361)
Maturity	-0.162	-0.605**	-3.859***	-5.105*
	(0.121)	(0.297)	(1.335)	(3.225)
Firm	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Within R^2	0.279	0.442	0.120	0.210
No. Obs.	443	241	763	331

We also run 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). Untabulated results show that DBU remains

insignificantly associated with bond yield spreads. Importantly, the coefficient on *DBU* also remains insignificant in all specifications when we use the sub-sample of propensity score-matched firms. Hence, there is no empirical evidence that endogeneity affects our inferences.[40] Overall, the results of the cost of debt analyses suggest that debtholders do not price protect themselves from, and rating agencies do not attribute, a greater likelihood of a default following the distribution of dividends originating from unrealized earnings.

It is important to note that the insignificant difference in the cost of debt between DBU and non-DBU 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 DBU 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-DBU firms. Concomitantly, DBU firms recognized significant amounts of unrealized earnings, whereas in non-DBU 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 firm.[41]

It is also important to note that the results do not imply that the bond market is inefficient in general. In the univariate analyses sub-section, we provided 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 DBU. We

[40] As an alternative procedure to address endogeneity concerns, we repeated the analysis using two-stage least squares regressions (2SLS). The results of the 2SLS regressions (not tabulated to conserve space) are consistent with those reported above.

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

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 DBU and DR (*DBU*DR*).[42] The results (not tabulated for parsimony) show that the coefficient on *DR* is significantly positive (at the 1 percent level) in all of the model specifications, whereas the coefficient on *DBU*DR* is consistently insignificant. This finding indicates that bondholders (rating agencies) are able to 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 *DBU* and *DBU*DR* in the model suggests that bondholders (rating agencies) do not anticipate a higher default risk for DBU firms. Therefore, they do not price protect themselves from an imminent debt restructuring due to DBU (reduce the bond's rating). In other words, we rule out the possibility that bondholders may *not* be charging a higher cost of debt from, and rating agencies may *not* be reducing the rating of, DBU firms only when they *do not* anticipate a dividend distribution based on unrealized earnings to cause a default.

Altogether, the results suggest that dividends originating from unrealized earnings place the firm's debtholders at greater risk, in line with the wealth redistribution hypothesis. Markedly, debtholders do not price this greater risk, nor do analysts take it into account when rating a DBU firm's debt, probably because they believe that these dividends convey information about the firms' financial solidity. By allowing themselves to distribute dividends based on dubious earnings, DBU firms seem to be sending a strong signal to the market about their ability to generate future cash flows sufficient to

[42] Note that in this analysis, the DR measure is firm-based. That is, the dummy variable for a future debt restructuring is the same for the firm throughout the sample period. As such, instead of a standard fixed effects panel model, we estimate the spreads and ratings equations using the Hausman-Taylor method, treating only the year dummies and the industry dummies as exogenous to the time invariant characteristics of the firm (the firm's fixed effects)

pay off their debts and then some to fund growth opportunities. Our evidence, however, reveals this signal to be false, suggesting that DBU disrupts the signaling equilibrium. Owing to 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.

5. Robustness tests

To examine the robustness of the results further, we conduct the following separate sensitivity analyses.

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

The fact that around 60 percent of the DBU firms, as well as of the defaulting firms, in our sample are real estate firms requires that we examine whether this sub-group of firms is driving our results. We thus repeat our analyses for real estate and for non-real estate firms (all of the firms in our sample that are not affiliated with the real estate industry) separately. The separate estimations, displayed in Table 6, show that our results still hold when real estate firms are excluded from the sample. Specifically, the coefficient on *DBU* is significantly positive in the debt restructuring regressions for real estate as well as for non-real estate firms. In the rating and yield spread regressions, the coefficient of *DBU* is insignificant for both groups of firms. We conclude that our inferences are not driven solely by the prevalence of real estate firms in the sample.

TABLE 6: Robustness tests: Real estate vs. non-real estate companies

This table presents the results of the Cox proportional hazard model regression for debt restructuring and those of the cost of debt fixed effects regression separately for real estate and non-real estate firms. All of the variables are as defined in Tables 3 and 5. Entries are coefficients; standard errors clustered at the firm level appear in parentheses. ***, ** and * indicate significance at the 1 percent, 5 percent and 10 percent (two-tailed) level, respectively.

	Debt restructuring		***Rating***		***Yield spreads***	
	Real estate firms	**Non-real estate firms**	**Real estate firms**	**Non-real estate firms**	**Real estate firms**	**Non-real estate firms**
Intercept			12.020***	20.960***	35.030	23.720
			(4.517)	(5.416)	(21.968)	(39.813)
DBU	1.209**	1.429***	-0.014	-0.788	7.374	-3.916
	(0.474)	(0.473)	(0.665)	(0.594)	(6.071)	(3.001)
DivPayout	-0.188	-1.292	0.027	0.043	-2.304	-0.024
	(0.227)	(1.043)	(0.171)	(0.073)	(1.813)	(0.704)
Size	-0.483	-0.897**	-6.548***	-5.951**	-3.548	-9.308
	(0.461)	(0.445)	(1.796)	(2.323)	(8.911)	(17.525)
ROA_Real	-3.942***	-1.755	-1.971	-0.858	-27.650	-21.250
	(1.385)	(1.467)	(2.354)	(1.682)	(23.644)	(22.698)
LossReal	0.976	1.238**	0.167	0.864**	-0.272	2.316
	(0.641)	(0.618)	(0.376)	(0.428)	(2.529)	(2.893)
ROA_Unreal	-8.510**	-3.305	0.160	-1.072	-32.340	-12.340
	(3.323)	(2.134)	(2.709)	(1.566)	(22.922)	(20.017)
LossUnreal	-0.441	-1.614*	-0.091	-0.184	0.546	0.754
	(0.682)	(0.935)	(0.378)	(0.364)	(3.400)	(2.206)
Leverage	0.201	-0.105	16.440***	3.153*	10.630*	24.010
	(0.285)	(0.304)	(4.739)	(1.686)	(7.074)	(18.034)
InterestCovera-ge	-0.008*	0.004	0.001	0.002	-0.024*	-0.007
	(0.004)	(0.006)	(0.001)	(0.005)	(0.013)	(0.019)
CurrentRatio	-0.484**	-0.359*	-0.073	-0.248	-0.917*	-1.111
	(0.197)	(0.209)	(0.219)	(0.169)	(0.531)	(1.353)
Tangibility	-0.831	-1.228	-2.092	-4.444***	-9.717	-15.310
	(1.821)	(1.059)	(1.989)	(1.619)	(11.873)	(18.705)
Maturity	-0.424**	-0.344**	-0.035	-0.241***	-7.153**	-1.551**
	(0.198)	(0.165)	(0.254)	(0.085)	(3.157)	(0.753)
Industry		Yes				
Firm			Yes	Yes	Yes	Yes
Year			Yes	Yes	Yes	Yes
Pseudo R^2	0.180	0.246				
Likelihood ratio chi-squared	72.27 (p-value < 0.000)	84.36 (p-value < 0.000)				
Within R^2			0.366	0.289	0.158	0.112
No. Obs.	383	649	192	251	343	420

5.2. Alternative DBU classification schemes

The classification of firms as DBU versus non-DBU is a key element of this study. We thus examine the robustness of our results to alternative classification schemes to alleviate concerns that our inferences may be driven by a specific classification measure.

5.2.1. Classification of DBU firms based on historical payout ratios

Consistent with Chen and Gavious (2016), we apply an alternative procedure of DBU classification based on the assumption that companies tend to maintain a relatively stable dividend policy. This assumption is consistent with the vast dividend literature (see Section 2). Specifically, for each firm:

a. We calculate the dividend payout ratio in each of the pre-IFRS years (the amount of dividends paid in year t divided by the amount of total earnings in year t. Note that total earnings in the pre-IFRS years are all realized earnings).
b. We retain the highest pre-IFRS dividend payout ratio from the pre-IFRS period.
c. We identify the post-IFRS firm-years in which dividends were distributed to shareholders.
d. For each distribution identified in the post-IFRS period, we determine whether the distributing firm recognized positive unrealized earnings prior to the payout.
e. If criterion d is satisfied, we calculate the payout ratio from *realized* earnings (the amount of dividends paid in year t divided by the amount of realized earnings in year t).
f. We compare each payout ratio calculated as per criterion e with the highest payout ratio of the firm in the pre-IFRS period.
g. If this post-IFRS payout ratio is greater than the firm's highest payout ratio during the pre-IFRS period, we multiply the difference in the ratios by the firm's realized earnings in post-IFRS year t to obtain the amount of dividends suspected of coming from unrealized gains.

h. If the amount of this suspected dividend is less than or equal to the firm's accumulated unrealized gains (not distributed thus far), we infer that the increase in the payout ratio is due to the recognition of unrealized gains. In other words, the firm has distributed dividends based on unrealized earnings. Otherwise, we surmise that the firm did not distribute dividends based on unrealized earnings.

Using the highest payout ratio throughout the pre-IFRS period as a benchmark for the pre-IFRS payout policy rather than, for example, the average payout ratio, is designed to increase the likelihood that the determination about whether a firm has distributed unrealized earnings as dividends is correct.[43] Based on this alternative classification, we identify 80 DBU firms (162 firm-years). On average, each DBU firm paid dividends based on unrealized earnings 2.22 times during the sample's 6-year post-IFRS period. Of the DBU firms according to this classification, 55 percent required debt restructuring during the sample period, compared to none of the dividend paying non-DBU firms.[44] We repeat all of our analyses using the alternative DBU classification. The results, presented in Table 7, indicate that our findings are robust to either classification scheme used.

[43] Note that in this classification scheme, the assumption that all realized profits are distributed before any unrealized profits are distributed is relieved.

[44] Seventeen percent of the non-DBU firms did need debt restructuring, but none of them paid out dividends prior to the default.

TABLE 7: Robustness tests: An alternative DBU classification scheme

Table 7 presents the results of the Cox proportional hazard model regression for debt restructuring and those of the cost of debt fixed effects regression with an alternative DBU classification scheme as described in Section 5. All of the other variables are as defined in Tables 3 and 5. Entries are coefficients; standard errors clustered at the firm level appear in parentheses. Results are presented once for the pooled sample and once for the sub-sample of ex-ante similar firms. ***, ** and * indicate significance at the 1 percent, 5 percent and 10 percent (two-tailed) level, respectively.

	Debt restructuring		***Rating***		***Yield spreads***	
	Pooled sample	**Propensity score-matched sample**	**Pooled sample**	**Propensity score-matched sample**	**Pooled sample**	**Propensity score-matched sample**
Intercept			17.940***	25.240***	29.260	116.500***
			(3.264)	(4.738)	(17.897)	(41.973)
DBU	1.700***	2.648***	0.427	0.237	3.428	0.835
	(0.294)	(0.993)	(0.404)	(0.331)	(4.117)	(7.882)
DivPayout	-0.333	0.095	-0.007	0.171	-1.488	-3.252
	(0.272)	(0.175)	(0.099)	(0.191)	(0.979)	(2.555)
Size	-0.788***	-0.657	-5.712***	-7.113***	-6.087	-35.090**
	(0.280)	(0.601)	(1.300)	(1.564)	(7.430)	(16.168)
ROA_Real	-2.195**	-5.173***	-0.734	-3.845*	-27.190*	-83.790*
	(0.935)	(1.620)	(1.249)	(2.404)	(16.050)	(45.375)
LossReal	1.203***	0.673	0.437*	0.134	1.345	-0.424
	(0.456)	(0.683)	(0.262)	(0.371)	(1.840)	(5.012)
ROA_Un-real	-4.709***	-7.689**	-1.249	-4.572*	-27.410*	-104.700**
	(1.821)	(3.803)	(1.196)	(2.343)	(16.317)	(47.175)
LossUnre-al	-0.735	0.070	-0.175	-0.677	0.336	-1.091
	(0.540)	(0.775)	(0.275)	(0.911)	(2.172)	(7.827)
Leverage	-0.108	-0.229	6.392***	6.459*	11.170	15.850
	(0.199)	(0.516)	(1.993)	(3.329)	(7.081)	(11.274)
InterestC-overage	0.002	-0.031*	0.002	0.001	0.006	-0.020
	(0.003)	(0.019)	(0.002)	(0.003)	(0.015)	(0.031)
CurrentR-atio	-0.381***	-0.565**	-0.190	-0.216	-0.724*	1.582
	(0.127)	(0.234)	(0.149)	(0.255)	(0.407)	(1.187)
Tangibility	-1.194	-1.439	-4.284***	-6.515**	-2.853	-29.280
	(1.021)	(2.241)	(1.369)	(2.904)	(11.798)	(31.007)
Maturity	-0.389***	-0.601***	-0.171	-0.629**	-3.849***	-5.104*
	(0.131)	(0.203)	(0.120)	(0.308)	(1.334)	(3.231)
Industry	Yes	Yes				
Firm			Yes	Yes	Yes	Yes
Year			Yes	Yes	Yes	Yes
Pseudo R^2	0.208	0.305				
Likelihood ratio chi-squared	218.30 (p-value < 0.000)	162.50 (p-value < 0.000)				
Within R^2			0.282	0.439	0.120	0.210
No. Obs.	1,032	383	443	241	763	331

Placebo analysis

The DBU classification procedure described above allows us to conduct an additional test for the causal relationship between the distribution of dividends based on unrealized earnings and financial risk: a placebo DBU analysis. The definition of the placebo DBU is similar to the definition of the DBU variable with one exception: the firm did *not* recognize revaluation gains at any time throughout the post-IFRS period. The procedure for classifying a placebo DBU firm is as follows:

a. We calculate the dividend payout ratio in each of the pre-IFRS years.
b. We retain the highest pre-IFRS dividend payout ratio from the pre-IFRS period.
c. We identify the post-IFRS firm-years in which dividends were distributed to shareholders.
d. For each distribution identified in the post-IFRS period, we determine whether the distributing firm recognized positive unrealized earnings prior to the payout.
e. If criterion d is *not* satisfied, we calculate the payout ratio.
f. We compare each payout ratio calculated as per criterion e with the highest payout ratio of the firm in the pre-IFRS period.
g. If this post-IFRS payout ratio is greater than the firm's highest payout ratio during the pre-IFRS period, we categorize this firm as a placebo DBU.

A significantly positive coefficient on the placebo DBU in the default regressions would imply that the dividend payment itself, rather than the fact that dividends are based on unrealized earnings, is the factor affecting the firm's risk of defaulting on its debt. On the other hand, an insignificant coefficient on the placebo DBU would strengthen our confidence in the inference that the distribution of dividends based on unrealized earnings increases a firm's financial risk as expressed by a greater probability of requiring debt restructuring. Indeed, untabulated results show that the coefficient on the

placebo DBU is consistently insignificant in all of the regressions. All of the other controls are consistent with expectations. These results indicate that rather than the distribution of dividends in itself, it is the fact that the dividends are based on unrealized earnings that increases the firm's risk of defaulting on its debt.

5.2.2. An additional sensitivity analysis of the definition of DBU

In another sensitivity analysis of our definition of DBU, we replace the DBU indicator variable with a continuous variable that captures the dividend payouts from unrealized earnings in the regressions. Specifically, we calculate a dividend-payout-based measure of DBU as follows: the nominator 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 total net income (realized plus unrealized) for this period.[45] The results (untabulated) 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 DBU 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 sub-prime crisis years 2008-2009 affects our results. In 2008, 7 debt restructuring events occurred, while in 2009 the number jumped to 27 (see Figure 1). Note that the number of debt restructuring events in 2011 and 2012 is not much smaller than that of the 2009 crisis

[45] Note that this measure of DBU is firm-based. Since the measure for a certain firm is based on the aggregate amount of dividends based on unrealized earnings throughout the sample period, it is the same for the firm throughout the sample period. As such, instead of a standard fixed effects panel model, we estimate the spreads and ratings equations using the Hausman-Taylor method, treating only the dummies for the year and the industry as exogenous to the time invariant characteristics of the firm (the firm's fixed effects).

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 sub-prime crisis years are excluded from the analysis. We thus repeat our analyses for the sub-sample that excludes the years 2008-2009. The results (not tabulated for parsimony) show that the likelihood of a debt restructuring event is significantly higher for DBU firms even when the crisis years are excluded from the analyses. Additionally, the cost of debt is not significantly different for DBU and non-DBU firms in non-crisis years. All of the findings are robust to using the pooled sample of firms as well as to a propensity score-matched sample.

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

Lastly, we examine the sensitivity of our results to the degree of the liquidity of the firm's bonds to address the concern that a small number of firms with low liquidity bonds drive the documented mispricing of default risk. 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.[46] Untabulated results show that the documented mispricing of increased default risk in DBU firms is robust to controlling for the degree of the bonds' liquidity, according to both measures of liquidity.

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

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 payouts 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 payout. However, the market does not price this enhanced risk. Specifically, both the yields on the firm's bonds and the bond ratings by credit rating agencies are not directly affected by the firm's distribution of dividends originating from unrealized earnings. It seems that such distributions mislead debtholders and analysts, who regard them as a signal about the firm's financial solidity. Such a signal (falsely) reduces the degree of uncertainty for these important market players, resulting in the increased default risk being mispriced.

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