CAPITAL STRUCTURE DECISIONS OF FIRMS AND BANKS: ENDOGENOUS AND EXOGENOUS DETERMINANTS AND CONSEQUENCES

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DEDICATION

To my beloved family.

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LIST OF ABBREVIATIONS

(Without consideration of abbreviations that are only used in the main manuscripts.)

e.g.	for example
et. al.	and others
EU	European Union
ID	identification
i.e.	that is
IFRS	International Financial Reporting Standards
JEL	Journal of Economic Literature
No.	number
p.	page
SSRN	Social Science Research Network
VHB	Verband der Hochschullehrer für Betriebswirtschaft
vs.	versus

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CHAPTER I

I.-I.   INTRODUCTION

Firms and banks can raise funds (cash) from various lenders or from shareholders to finance (real) investment(s) (Brealey et al. 2010; Berk and DeMarzo 2017). Lenders that contribute cash require an ongoing payment of fixed or variable rate of interest and repayment at maturity (Brealey et al. 2010; Berk and DeMarzo 2017). Shareholders that contribute cash cannot claim fixed returns, but they take over a share capital, receive voting rights and a fraction of future profits and the associated cash flow (Brealey et al. 2010; Berk and DeMarzo 2017). Lenders are *debt financiers*, who contribute debt financing, whereas shareholders are *equity investors*, who contribute equity financing (Brealey et al. 2010; Berk and DeMarzo 2017). The decision between debt and equity financing is referred to as the *capital structure* decision (Brealey et al. 2010; Berk and DeMarzo 2017). In this context, *capital* refers to the firm's or bank's long-term financing source (Brealey et al. 2010; Berk and DeMarzo 2017).

The study of capital structure aims to examine the mix of instruments $\{I_1, I_2, \dots, I_n\}$ and funding sources $\{F_1, F_2, \dots, F_n\}$ used by firms or banks to finance (real) investment(s). Most research on capital structure focuses on the observed relation of debt vs. equity (e.g., Myers 1984; Myers and Majluf 1984; Berger et al. 1995; Diamond and Rajan 2000). The debt-equity choice however lacks a universal all-embracing theoretical framework (Myers 2001). Therefore, several conditional theories emerged that "*differ in their relative emphases on, or interpretation of, relevant factors*" (Myers 2001). Neither of those theories are designed to claim being general (Myers 2001). However, each of those theories emphasize certain costs and benefits of alternative funding strategies (Myers 2001).

First, the *trade-off theory* proposes that firms aim at debt levels to balance tax advantages that

additional debt offers against possible costs of distress (Myers 1984). Firms and banks therefore tend to exploit these tax advantages by debt financing. Second, the *pecking order theory* proposes that firms are prone to finance (real) investment (e.g., capital expenditures and securities) by raising additional debt financing when internal cash flow is exhausted, rather than raising equity financing (Myers 1984; Myers and Majluf 1984). Consequently, the accumulation of debt financing is likely to reflect the need of external funds. Third, the *free cash flow theory* proposes if firms operating free cash flow significantly exceeds their profitable investment opportunities, high levels of debt financing contribute to a higher value, despite the omnipresence of financial distress (Jensen 1986). Lastly, the *theory of bank capital* proposes that a bank's capital structure determines the bank's liquidity and credit creation function, as well as its stability (Diamond and Rajan 2000). The resulting trade-offs suggest an optimal bank capital structure (Diamond and Rajan 2000).

Therefore, capital structure decisions undertaken by firms and banks matter and create value, compared to the value creation that comes from product development, a (worldwide) reliable customer base, from profitable investment in capital expenditures or securities, and lending (Brealey et al. 2010; Berk and DeMarzo 2017). The predominant factors why capital structure decisions matter are considerations about taxes, differences in agency and information costs (e.g., Myers 2001).

The relative importance of debt financing by firms and banks have to be considered on a differentiated basis. Firms that possess greater information asymmetry raise short-term debt financing (Custodio et al. 2013) to fund working capital. Agency and information issues that are linked to the risk of rolling over short-term debt because of negative economic shocks provide an incentive for firms to raise long-term debt financing (Diamond 1991; Guedes and Opler 1996; Badoer and James 2016). Overall, firms' capital structure is shaped, among other things, by the

countries' tax system, the economic environment, the borrower-lender relationship and the firms' exposure to the capital market (e.g., Antoniou et al. 2008).

Conversely, short-term debt financing by banks is split into demand deposits and wholesale financing. Demand deposits are non-negotiable short-term claims of customers from the local geographic market (Diamond and Rajan 2000). Demand deposits are a cheaper source of short-term financing compared to wholesale financing, have lower interest rate sensitivity, are "sticky" with reference to funding liquidity risk and sensitivity to the financial market conditions. As the supply of demand deposits is price-inelastic, banks use short-term wholesale financing provided by other banks, when they wish to expand their lending. Banks use long-term debt financing to trade-off credit, liquidity creation and the costs of distress (Diamond and Rajan 2000). Empirical evidence for bank-specific characteristics show, that banks with demand deposit supply constraints, larger capital buffers and better credit ratings issue more long-term debt (e.g., Diamond and Rajan 2001; Berger and Bouwman 2009; Gambacorta and Shin 2018). This suggests that those banks have better access to long-term funding sources, even during periods of crises. Financial market and country-specific characteristics also indicate, that elevated stock market volatility and higher sovereign CDS spreads drive banks' long-term debt issuance (e.g., van Rixtel and Gasperini 2013).

Taken together, the capital structure of firms and banks can be specified as the result of a variety of capital structure decisions $\{Y_1, Y_2, \ldots, Y_n\}$ to a set of events $\{X_1, X_2, \ldots, X_n\}$. The objective of this inaugural dissertation is to build on this specification of capital structure. Therefore, three manuscripts are devoted to shed light on selected *endogenous* or *exogenous* events $\{X_1, X_2, \ldots, X_n\}$ and examine how they affect the capital structure decision $\{Y_1, Y_2, \ldots, Y_n\}$ made by firms or banks. Relatedly, we hypothesize the respective capital structure decision by applying the relevant capital structure theory (or theories).

INTRODUCTION

The first manuscript examines firms' motivation to issue a hybrid bond, i.e., a specific type of hybrid security, and firms' choices of a respective hybrid bond structure. We draw on firms' endogenous forces, such as IFRS-based leverage and/or credit rating, to assess whether the firms consider leveraged based on IFRS and/or credit ratings when structuring hybrid bonds. The second manuscript examines the impact of heightened global economic policy uncertainty (GEPU) on banks' long-term debt. This setting is driven by GEPU, a macro-level economic policy uncertainty, that corresponds to an exogenous source of bank uncertainty and affects the role of long-term debt for bank financing. The third manuscript examines whether the bank regulators' implementation of prudential requirements for fair-valued positions recognized on banks' balance sheets is (i) procyclical to macroeconomic uncertainty and (ii) has an economic implication to originating loans. We investigate how an inherent feature of the regulation itself leads to changes in capital requirements and, more importantly, the corresponding changes to lending.

The inaugural dissertation is organized as follows. Chapter 1 includes the introduction and presents the relevant capital structure theories for this dissertation. Chapter 2 contains both the synopsis that works out the overarching relationship between the manuscripts presented in this dissertation, and the relevant three manuscripts. Chapter 3 concludes the inaugural dissertation by summarizing the main results.

TABLE 1: Summary of Main Manuscripts

	Manuscript No. 1	Manuscript No. 2	Manuscript No. 3
Title	Why Do Firms Issue Hybrid Bonds?	Weathering Heightened Global Economic Policy Uncertainty: The Role of Banks' Long-Term Debt	Economic Consequences of the Prudent Valuation Regulation
Sample Selection	Non-financial firms that access the public debt market	Banks that access the public long-term debt market	15 largest European banks that report additional value adjustments via the Pillar 3 Disclosure Reports
Set of Events	Declining creditworthiness based on accounting-based leverage and/or credit rating (i.e., endogenous factors)	Exposure to heightened global economic policy uncertainty (i.e., exogenous factor)	Implementation of prudential requirements under article 105 of the Capital Requirements Regulation (EU) no. 575/2013 (i.e., exogenous factor)
Research Question	Do firms consider leveraged based on (i) IFRS, (ii) credit ratings or (iii) IFRS and credit ratings when structuring hybrid bonds?	Do banks consider long-term debt financing during times of heightened global economic policy uncertainty?	Do additional value adjustments have a procyclical nature? Do banks respond by decreasing (increasing) its lending activities during increasing (decreasing) macroeconomic uncertainty?
Capital Structure Effect	Issuing a hybrid bond	Changes in long-term debt from quarter t_{-1} to quarter t	Changes in the core capital Common Equity Tier 1
Consequences	Improving (i) IFRS, (ii) credit ratings or (iii) IFRS and credit ratings	Strengthening the capital structure	Strengthening or weakening the core capital position
Theories Applied	Trade-off theory, credit rating-capital structure hypothesis and the pecking order theory	The theory of bank capital	The theory of bank capital

I.-II. CAPITAL STRUCTURE THEORIES

A.   *MODIGLIANI AND MILLER'S PROPOSITIONS*

Modigliani and Miller (1958) proof that financing does not matter if the condition of "*perfect capital markets*" is met. From Modigliani and Miller's point of view, the term "*perfect*" means that capital markets must be *competitive*, *frictionless* and *complete* (Modigliani and Miller 1958). As a result, the risk characteristics of each security issued can be matched by the purchase of another existing security or portfolio; utilizing a dynamic trading strategy would yield the same outcome (Myers 2001). Therefore, in *complete* capital markets the change in the capital structure does not change the risk characteristics that can be attained in any investor portfolio (Myers 2001). Relatedly, Fama (1978) summarizes those conditions set out by Modigliani and Miller (1958) (i.e., competitive, frictionless and complete capital markets) as *Proposition 1*.

Taking a closer look at Modigliani and Miller's *Proposition 1*, a firm's market value of debt (D) and equity (E) add up to the total firm's value (V) (Modigliani and Miller 1958). With reference to the assumption of *complete* capital markets, V is constant, regardless of the composition of D and E (Modigliani and Miller 1958). Hence, financial leverage that depicts various ratios of D is irrelevant (Modigliani and Miller 1958). This corresponds to any mix of securities by a respective firm, regardless of the maturity (i.e., short- or long-term debt) or type of security issued (i.e., plain vanilla, convertible or a mixture of both) (Brealey et al. 2010; Berk and DeMarzo 2017).

Furthermore, *Proposition 1* indicates that the cost of capital for each firm is constant, independent of the respective firm's debt ratio (Modigliani and Miller 1958). The cost of debt is depicted as r_D, the cost of equity as r_E; both depict the expected rates of return for either debt, r_D, or equity, r_E, financiers (Modigliani and Miller 1958; Brealey et al. 2010; Berk and DeMarzo 2017). The total *weighted average* cost of capital, r_A, is depended on the cost of debt, r_D, the cost of equity, r_E, and the market value ratios of D and E to the total firm's value, V, (Modigliani and

Miller 1958; Brealey et al. 2010; Berk and DeMarzo 2017).

$$\textit{Weighted Average Cost of Capital} = r_A = r_D \; x \; D/V + r_E \; x \; E/V \qquad (1)$$

The weighted average cost of capital, r_A, depicts the expected return on the respective firm's portfolio of outstanding securities issued (Myers 2001). It is also used as the discounting rate to assess capital investments (Myers 2001; Brealey et al. 2010; Berk and DeMarzo 2017).

According to Modigliani and Miller (1958), the weighted average cost of capital, r_A, is a constant. By decomposing debt and equity, the firm's debt has a prior claim on the respective firm's assets and earnings (Myers 2001; Brealey et al. 2010; Berk and DeMarzo 2017). This is why the cost of debt, r_D, has to be lower than the cost of equity, r_E (Myers 2001; Brealey et al. 2010; Berk and DeMarzo 2017). To explain the cost of equity, it is crucial to solve the equitation (1) for the cost of equity, r_E.

$$r_E = r_A + (r_A - r_D) \; x \; D/E \qquad (2)$$

In this case, the cost of equity, r_E, depicts the return that the equity financiers are expecting to receive for their investment (Modigliani and Miller 1958; Myers 2001; Brealey et al. 2010; Berk and DeMarzo 2017). Here, the cost of equity increases with the market value of the debt-to-equity ratio, D/E (Modigliani and Miller 1958; Myers 2001; Brealey et al. 2010; Berk and DeMarzo 2017). Consequently, the rate of increase in the cost of equity, r_E, is dependent on the spread between the cost of capital, r_A, and the cost of debt, r_D, (Modigliani and Miller 1958). It follows that the equation (2) is Modigliani and Miller's *Proposition 2* (Modigliani and Miller 1958).

Proposition 2 indicates that the substitution of equity, E, by increasing financial leverage, D, (i.e., issuance of debt securities) has no effect on the cost of capital, r_A, because the remaining cost of equity gets more expensive as the market value of the debt-to-equity ratio, D/E, increases (Modigliani and Miller 1958; Myers 2001).

After all, questions have been raised whether Modigliani and Miller's propositions are credible or not? "*Are capital markets really sufficiently perfect?*" (Myers 2001). Merton H. Miller's annotation to Modigliani and Miller's propositions in 1958 "*Looking back now, perhaps we should have put more emphasis on the other, upbeat side of the "nothing matters" coin: showing what doesn't matter can also show, by implication, what does*." (Miller 1989, p. 7) fueled the development of capital structure theories that specifically shed light on costs or imperfections (e.g., taxes, differences in agency and information costs) in conjunction with financing (e.g., Myers 2001).

B.   TRADITIONAL CAPITAL STRUCTURE THEORIES

Berger et al. (1995) summarizes the imperfections set out by Modigliani and Miller (1958) that, in essence, consists of: (i) agency costs, (ii) asymmetric information, (iii) costs of financial distress, (iv) taxes and (v) transaction costs. Based on this groundwork, the following three theories of capital structure evolved: the *trade-off theory* (Myers 1984), the *pecking order theory* (Myers and Majluf 1984) and the *market timing theory* (Baker and Wurgler 2002). They are further enriched by various hypotheses and schools of thought.

The *trade-off theory* of capital structure (Myers 1984) proposes that value-maximising firms will offset the costs and benefits of debt (compared to equity) to determine the optimal level of leverage. The associated costs of debt are generally a function of the bankruptcy costs and other costs of distress. In contrast, the related benefit of debt is predominantly a function of the value of its interest tax shields. Hence, the *trade-off theory* suggests that a firm tends to continuously adjust towards its optimal leverage, once it departs from its optimum (Myers 1984; Fama and French 2002).

Myers and Majluf (1984) developed the *pecking order theory*. This theory does not aim to determine the optimal leverage, but rather hypothesises that firms internal and external financing choices are driven by the cost of adverse selection, which is manifested in asymmetric information that differs between better-informed managers and less-informed investors (Myers and Majluf 1984). Overall, the *pecking order theory* attempts to explains the reason for (high levels of) debt financing for firms. Relatedly, high (low) profitable firms borrow less (more) from debt financiers, because they have more (less) internal funding sources at hand to fund investment opportunities (Myers and Majluf 1984; Myers 2001; Brealey et al. 2010; Berk and DeMarzo 2017)

The *credit rating-capital structure hypothesis* formulated by Kisgen (2006) provides an expansion of both *the trade-off theory* and *the pecking order theory*. Kisgen (2006) expects and

finds that *credit ratings* impact capital structure decisions, given discrete costs and benefits of different credit rating levels. Firms will offset those discrete costs and benefits against the costs and benefits implied by the *trade-off theory* and *the pecking order theory* (Kisgen 2006). These credit-rating-related effects are independent of target leverage management.

The *market timing theory* developed by Baker and Wurgler (2002) suggests that capital structure results "*as the cumulative outcome of past attempts to time the equity market*" and does not aim to identify an optimal capital structure. Managers exploit asymmetric information to the extent they believe the cost to issue equity is low and repurchase equity when they believe its costs are high (Baker and Wurgler 2002). Hence, low-levered firms raise funds when their valuations are high, and high-levered firms raise funds when their valuations are low (Baker and Wurgler 2002).

C.   BANKS AS A SPECIAL CASE

Berger et al. (1995) demonstrates that the traditional capital structure theory is only partially applicable to banks' capital structure. The complementary determinants of banks' capital structure include: (i) capital requirements imposed by regulators to provide a cushion against financial distress costs, (ii) an existing safety net created by governments to protect banks' creditors (mostly demand depositors) against banks' risk taking, (iii) unconditional payment guarantees, and (iv) access to the discount window (Berger et al. 1995).

Building on Berger et al. (1995), Diamond and Rajan (2000) developed *a theory of bank capital* that proposes that a bank's capital structure determines the bank's liquidity and credit creation function, as well as its stability. The resulting trade-offs suggest an optimal bank capital structure. Diamond and Rajan (2000) illustrate that the banks' asset side is a device that ties human capital to financial assets (i.e., loans) to create liquidity (Diamond and Rajan 2000). Moreover, they demonstrate that banks primarily rely on demand deposits[1] as a source of funding for lending activities (Diamond and Rajan 2000, 2001).

In times of *certainty*, banks maximize loan creation by funding themselves substantially through deposits (Diamond and Rajan 2000). This capital structure is fragile. However, during an ordinary course of business, banks do not need to liquidate assets when depositors withdraw their demand deposits. Instead, banks borrow from new depositors, given the prospective safety of the depositors' claim.

In times of *uncertainty*, a capital structure building on demand deposits is prone to bank runs. This risk constitutes a trade-off between credit and liquidity creation against the cost of bank runs

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[1] Demand deposits are non-negotiable short-term claims that bear an "*immediate collective action problem*" (Diamond and Rajan 2000). The immediate collective action problem characterizes a sequential service constraint, where holders of demand deposits withdraw all their money whenever they consider that their claim is at risk (Diamond and Rajan 2000). The bank, however, has to repay the promised amount without the right to renegotiate (Diamond and Rajan 2000).

(Diamond and Rajan 2000). Therefore, in times of uncertainty, banks will rely more on financing through "softer" claims (i.e., softer claims are called "capital" and interpreted as *equity* or *long-term debt*, Diamond and Rajan 2000). Softer claims are not subject to an immediate collective action problem and they can be renegotiated during uncertain times (Diamond and Rajan 2000). The *theory of bank capital* proposes that financing through additional capital (i.e., softer claims are called "capital" and interpreted as either *equity* or *long-term debt* (Diamond and Rajan 2000)) comes with less liquidity creation (and, thus, the bank's ability to originate loans) compared to financing through additional demand deposits (Peek and Rosengren 1995; Diamond and Rajan 2000).

In addition, during a time of *uncertainty*, equity issuances would be costly with respect to cost of adverse selection (Myers and Majluf 1984). Long-term debt, however, offers a relatively cost-efficient way to raise long-term financing, as claims associated with long-term debt are less sensitive to private information (lower cost of adverse selection), and are not subject to an immediate collective action problem (Frank and Goyal 2009).

CHAPTER II

II.-I.   SYNOPSIS

The three manuscripts included in this inaugural dissertation cover a common theme in which the capital structure decision $\{Y_1, Y_2, …, Y_n\}$ made by firms and banks is examined in presence of an endogenous or exogenous event $\{X_1, X_2, …, X_n\}$, by utilizing the relevant capital structure theory (theories).[2] In addition, in a selected case, the economic consequence is examined and assessed. Specifically, each of the manuscripts utilize thereby one (multiple) conditional capital structure theory (theories) to examine the respective capital structure decision made by either firms or banks.

Manuscript no. 1 utilizes both the *trade-off* and *pecking order theory* to examine the reason of firms' motivation to issue a hybrid bond, i.e., a specific type of hybrid security, and firms' choices of a respective hybrid bond structure. Relatedly, the *trade-off theory* enables to hypothesize, based on the value-maximizing premise of interest tax shields when the probability of distress for firms is relatively low, the reason of firms' motivation to issue a hybrid bond when facing an endogenous event (i.e., adverse changes in accounting-based leverage and/or credit rating). Whereas the *pecking order theory* builds on managers that exploit information asymmetries between them and outside investors and, hence, help to hypothesize the firms' choices of a respective hybrid bond structure.[3]

Manuscript no. 2 utilizes the *theory of bank capital* to examine the effect of heightened global economic policy uncertainty on banks' long-term debt financing. By drawing on the *theory of bank capital*, the concept of uncertainty, that depicts an exogenous event (i.e., heightened global economic policy uncertainty) from the perspective of bank financing, enables to hypothesize how banks finance their activities to trade-off credit and liquidity creation against the cost of bank runs. In this regard,

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[2]   In each manuscript, we follow the citation style as requested by the respective journal, if submitted.

[3]   When applying the *trade-off* and *pecking order theory*, the *credit rating-capital structure hypothesis* (Kisgen 2006) and the premise that debt or debt-like funds have *debt-contracting value* (Ball et al. 2008; Christensen and Nikolaev 2012) are also utilized, that helps to examine the hypotheses in manuscript no. 1.

"softer" claims (i.e., softer claims are called "capital" and interpreted as equity or long-term debt) are of great importance to overcome being subject to an *immediate collective action problem*. In addition, softer claims could be interpreted as the tool to reduce "agency costs" (i.e., agency costs rise when considering a possible bank run, which could signal a worsening creditworthiness of a respective bank) in the traditional sense of Myers (2001).

Manuscript no. 3 also utilizes the *theory of bank capital* to examine the economic effects on the loan origination of banks, as a consequence of bank regulators' implementation of prudential requirements under article 105 of the CRR (EU) no. 575/2013 for fair-valued positions recognized on banks' balance sheets. Furthermore, the prudent valuation regulation is driven by an exogenous valuation uncertainty shock (i.e., an economic downturn-induced increase (decrease) of macroeconomic uncertainty). In this regard, the *theory of bank capital* enables to hypothesize how banks adjust their lending behavior if its regulatory capital exacerbates (reduces) the exposure to demand-deposit financing relative to capital. This phenomenon can be seen in the light of managing "agency costs" (i.e., agency costs rise as a consequence of a reduction in regulatory capital compared to debt financing and, hence, reduces a bank's creditworthiness as a consequence) in the traditional sense of Myers (2001).

Notwithstanding the fact that this inaugural dissertation examines the capital structure decision made by firms and banks, that is a heterogenous group of market participants, common capital structure theories provide a solid groundwork to hypothesize capital structure decisions in a world of increasing complexity of the capital market.

II.-II. MAIN MANUSCRIPTS

A.   *WHY DO FIRMS ISSUE HYBRID BONDS?*

Authors:	Martin Bierey, Martin Schmidt and Mateusz Tokarski
Status:	Publication at *European Accounting Review*
Journal Ranking:	VHB Ranking *A*
SSRN ID:	2801743

Manuscript is available upon request.

B. *WEATHERING HEIGHTENED GLOBAL ECONOMIC POLICY UNCERTAINTY: THE ROLE OF BANKS' LONG-TERM DEBT*

Authors:	Martin Schmidt and Mateusz Tokarski
Status:	Beyond Desk Reject at *The Quarterly Review of Economics and Finance*
Journal Ranking:	VHB Ranking *B*
SSRN ID:	4811954

Manuscript is available upon request.

C.   *ECONOMIC CONSEQUENCES OF THE PRUDENT VALUATION REGULATION*

Authors:	Martin Schmidt and Mateusz Tokarski
Status:	Working Paper, November 2024
SSRN ID:	5027440

Manuscript is available upon request.

CHAPTER III

III.   CONCLUDING REMARKS

The objective of this inaugural dissertation is to examine the capital structure decision $\{Y_1, Y_2, …, Y_n\}$ made by firms and banks based on a selected set of endogenous or exogenous events $\{X_1, X_2, …, X_n\}$. Drawing on common capital structure theories and utilizing either endogenous or exogenous events, enabled to hypothesize the respective capital structure decision made my firms and banks. The findings are as follows:

Manuscript no. 1 examines why firms issue hybrid bonds. Hybrid bonds can be structured so that they can be classified as either debt or equity under IFRS and/or by credit rating agencies. We exploit this setting to examine whether firms consider leverage based on IFRS and/or credit ratings when structuring hybrid bonds. We find the following: First, unrated firms issue hybrid bonds that are classified as equity under IFRS if their IFRS-based leverage is higher. Rated firms issue hybrid bonds classified as equity by credit rating agencies if their credit rating is at risk and when their credit rating deteriorates. Second, drawing on the debt contracting value of accounting information and credit ratings, we expect and find that rated firms with stronger credit ratings issue hybrid bonds structured to be classified as equity solely by credit rating agencies but as debt under IFRS. Conversely, rated firms with a weaker credit rating and a higher default risk issue hybrid bonds that are classified as equity under IFRS and by credit rating agencies. Firms incur considerable interest costs when issuing hybrid bonds, suggesting that firms associate substantial benefits with an equity classification under IFRS and/or by credit rating agencies.

Manuscript no. 2 examines the impact of heightened *global economic policy uncertainty* (GEPU) on banks' long-term debt. We expect and find a strong positive association between heightened GEPU and increases in banks' long-term debt. This finding is robust to controlling for asset risk and macroeconomic uncertainty. Our cross-sectional tests further confirm our prior findings and: (i) are robust across different

periods with episodes of substantially heightened GEPU, (ii) hold after splitting the sample into the respective industry groups, but document that the economic magnitude of the GEPU effect is more pronounced for regional banks compared to diversified banks and (iii) demonstrate that the positive and statistically significant effect of GEPU on increases in banks' long-term debt holds for low- and well-capitalized banks. We conclude that banks opt to diversify their capital structure by increasing long-term debt financing in times of heightened GEPU.

Manuscript no. 3 examines the procyclical nature and the economic effects on loan origination of bank regulators' prudential requirements for fair-valued positions recognized on banks' balance sheets beginning in 2016. The prudential requirements oblige banks to estimate additional value adjustments (AVAs) based on nine sources of uncertainty for all positions recognized at fair value and subsequently recognize those as a deduction from Common Equity Tier 1. We expect and find the growth of macroeconomic uncertainty (i.e., economic downturn) to be positively correlated with the growth of AVAs, indicating that the new prudential requirements have a procyclical nature. Relatedly, we predict and find that those banks exposed to the new prudential regulatory regime originate significantly less loans to businesses around the time of bank regulators' implementation of those prudential requirements.

The main findings of the three manuscripts are of interest to firms, investors and regulators. The findings allow for a better understanding and assessment of certain capital structure decisions and related (real economic) consequences.

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