Who You Are Matters More Than What You Do: Financing Expectations and Firm Performance *

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Abstract

The decision-making process of firms' security issuance has been hypothesized in prior studies to be an adjustment toward optimal capital structure, a signal of true firm value in the presence of information asymmetry, or an attempt to take advantage of higher valuation through market timing. A body of empirical work has evolved to model market participants' expectations of firm capital structure changes based on these theories. We contribute to and extend this literature using transaction-level data and accounting for self-selection in security issuance choice. Employing both traditional econometric and latest machine learning techniques, we develop empirical models for predicting firm financing choices. We label firms based on their ex-ante financing expectations, that is, the highest probability of issuing particular type of security among the alternatives in our security choice models. The paper then examines the impact of ex-ante financing expectations on the announcement effect, long-run stock performance, and long-run operating performance, subsequent to debt and equity issuances. We find heterogeneous market reaction to security issuance across financing expectations. We show market reacts to the type of firm that undertakes a surprise issuance and not to the particular security type per se. Our results are robust in multiple model specifications.

Keywords: Capital Structure, Security Issuance, Underperformance, Machine Learning

JEL Codes: G30, G32

1 Introduction

Although corporate theory provides various explanations for heterogeneity in firm financing choices, there is little work that investigates the impact of surprising markets with an unexpected issuance choice or the long run implications of this for operating performance. We build empirical models of issuance choice from existing theoretical capital structure models of asymmetric information and signaling, notions of optimal capital structure, and market-timing.[1] Leveraging off these models and employing both traditional multinomial logistic regression and machine learning techniques, we estimate the probability of the type of security issuance given firm characteristics. Our goal is to categorize firms by propensity to issue various securities – some firms are identified as "equity-type" and are expected to issue equity, not debt, for instance – and to explore the implications of firms behaving consistently with expectations versus surprising the market.

We find heterogeneous market reaction to security issuance across the "firm-type". We show firms should consider the market's expectation prior to making financing choices, as the difference in market reaction is economically significant, especially for equity-type firms. Our results for long-run stock performance are consistent with the under-performance phenomenon associated with seasoned equity offerings but it appears that the market reacts to the type of firm that undertakes a security issue more so than to the particular security per se., and this highlights the effect of firm-type and financing expectations. We conduct a group of analyses to show the relationship between "who you are" and "what you do", conditional on "firm-type". When firms' issuance is not expected by the market (i.e., against their "firm-type"), the market appears to view this surprise issuance as information revelation regarding the underlying risks the firm bears. We document a significant relationship between financing expectation and announcement effect and we show that in the long-run the "sur-

[1]Some of the seminal capital structure and security issuance papers include Ross (1977), Myers (1984), Myers and Majluf (1984), and Lucas and McDonald (1990), who focus on asymmetric information. Modigliani and Miller (1963), Jensen and Meckling (1976), Fisher, Heinkel and Zechner (1989), Stulz (1990), and Harris and Raviv (1990), focus on optimal capital structure. Stein (1996) and Baker and Wurgler (2002) propose market-timing explanations for capital structure choice.

prise" issuance seems to reduce the magnitude of the stock performance of "non-surprise" issuance. For instance, equity-type firms tend to under-perform if they issue anything, but if they issue debt (against-type) they experience less severe long-run under-performance than they experience when they issue equity (with-type). Debt-type firm performance tends to be unaffected by issuance – when they issue debt (with-type), there is no negative long-run abnormal return performance and when they issue equity they exhibit zero or slightly positive returns. These results are also documented for long-run operating performance following security issuance.

In order to reach these conclusions we construct a quarterly measure of the ex-ante financing expectation of a firm, based on the highest probability of issuing a particular type of security among any of the alternatives in our security choice models. We then assign "firm-type" as the particular type of security that has highest predicted probability of being issued. For instance, we define a firm as "equity-type" (or "debt-type") in a given quarter if the predicted probability of issuing equity (or debt) surpasses the probability of issuing anything else, respectively. We examine the impact of firms' financing choices by exploiting the "firm-type" predicted by our best-performing security choice model. Specifically, we perform a host of event studies on announcement effects of issuance, post-issuance long-run stock performance, as well as long-run operating performance. We compare the predictive performance when constructing the financing expectation using multinomial logistic regressions and random forest algorithm. We show random forest models outperform logistic models with higher probability, higher confidence and much clearer separation among alternatives. We provide insights into the main sources for the improvements: the 18 predictors that derived from corporate finance theories. Our comparison suggests that without the guidance from finance theories, random forest model cannot deliver informative predictions, but that tuning with guidance improves predictions. To the best of our knowledge, we are the first to document this performance comparison in the issuance prediction context.

Our paper is related to theoretical work by Hennessy, Livdan, and Miranda (2008) who

build a dynamic model of financing and investment under repeated hidden information (i.e., firm insiders having superior information which is only observed by the markets with a lag). In this setting they show that low quality firms are unlevered and overinvest while high quality firms signal their net worth by substituting debt for equity. Their model therefore suggests that debt announcements by equity type firms should be met with a positive announcement effect and this effect should be stronger than debt announcements by debt type firms.

Our paper is also related to earlier empirical work of Bayless and Chaplinsky (1991), who identify unexpected equity and debt issues by the predicted probability of issuing equity (debt) and document that unexpected issues have more negative abnormal stock return in absolute value at announcement, and Jung, Kim and Stulz (1996), who demonstrate that abnormal returns on equity (debt) issues are positively (negatively) correlated with the probability of issuing equity. Our paper differs substantially from these two studies in that we are the first to introduce the concept of ex-ante financing expectations and to show that abnormal returns vary systematically when incorporating such financing expectations into empirical capital structure models. We also cover a broader range of data (security issuance types) over a longer study horizon; our analysis is run on transaction level data; and we include firms that issue no securities ("non-issuing" observations), thus avoiding a potential sample selection bias. Further, our empirical models also allow us to identify pure market timers and analyze their performance following security issues. Our security choice model achieves substantially improved predictive power on a wide range of financing alternatives relative to previous efforts in the literature. To the best of our knowledge, this is the first paper that successfully captures the significant information content of ex-ante financing expectations for security issuance choice, as well as the first to do so using machine learning techniques.

Another unique methodological contribution of this paper is the fashion in which we capture the information content of non-issuer firm-quarters. The appropriate modeling of

the cross-sectional and time-series covariances and correlations of the approximately 440,000 non-issuer firm quarters over our 33 years of data sample is infeasible, and ignoring the panel cross-section time-series nature of the data leads to extremely poor model fit. Borrowing from empirical asset pricing, we address these issues by forming 25 portfolios based on firm size and market-to-book quintiles in each quarter, forming value-weighted averages of our variables by quarter, then using this portfolio non-issuer firm-quarter data and individual firm-quarter observations for firms that conducted issuances to estimate our model (with appropriate weighting to take account of using portfolios of non-issuer firms).

The rest of the paper is organized as follows. Section 2 briefly reviews the related literature. Section 3 describe the data and sample construction. Section 4 discuss our empirical methodology. Section 5 presents the discussion of our empirical results. Section 6 concludes.

2 Related Literature - A Brief Review

How corporate capital structure is determined is one of the most debated topics in corporate finance. Since Modigliani-Miller Proposition I in 1958, researchers have developed various theoretical models explaining corporate capital structure and financing decisions. So far, these theories can be broadly classified into three strands: trade-off based theories (Modigliani and Miller (1963), Jensen and Meckling (1976), Diamond (1989), Hirshleifer and Thakor (1992), Fisher, Heinkel and Zechner (1989), Harris and Raviv(1990), Stulz (1990), among others), information theories (Ross (1977), Leland and Pyle (1977), Myers (1984), Myers and Majluf (1984), Lucas and McDonald (1990), among others), and behavioral finance theories (Baker and Wurgler (2002) and Welch (2004)).

The common theme underlying the trade-off theories is that an optimal capital structure can be achieved by balancing the benefits of debt against the costs. The benefit-cost trade-off arises due to the existence of various market imperfections: such as corporate taxes and bankruptcy costs as suggested by Modigliani and Miller (1963) and agency costs (i.e.,