



Diversification and heterogeneity of investor beliefs



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ABSTRACT

In the paper, we find that diversification reduces the heterogeneity of investor beliefs on firm value. We obtain this finding by comparing not only between diversified and focused firms but also between diversifying and non-diversifying mergers. We also find that the reduced heterogeneity of investor beliefs on a diversified firm relative to its focused peers is negatively associated with its contemporaneous excess value and positively associated with its future excess value. Overall, our results contribute to the understanding about how corporate organization structure affects the heterogeneity of investor beliefs and further firm value.

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1. Introduction

Investors have heterogeneous beliefs on a firm's future prospects. The finance literature has studied in depth how the heterogeneity of investor beliefs affects security valuations (see, e.g., Miller, 1977, and subsequently Harrison and Kreps, 1978; Mayshar, 1983; Morris, 1996). However, it is still not well understood how the heterogeneity is affected by a firm's attributes such as the organization structure of the firm. In this paper, we address this and the related questions by studying the effect of diversification on the heterogeneity of investor beliefs. We also study how diversification affects a firm's value by affecting the heterogeneity of investor beliefs. To our knowledge, our paper is the first to compare the level of heterogeneous investor beliefs between diversified and focused firms. It is also the first to relate the difference in the heterogeneity of investor beliefs between diversified and focused firms to the difference in their valuations (i.e., diversification discount). Thus, our paper contributes to the literature in two ways. First, our paper enhances the understanding on how a firm's organization structure affects the heterogeneity of investor beliefs. Second, our paper also enhances the understanding on the links between corporate organization structure and firm value from the new perspective of the heterogeneity of investor beliefs.

The research on the heterogeneity of investor beliefs dates back to Miller (1977). Miller (1977) suggests informally that diversification could reduce the disagreements among investors on the combined firm's value. When a focused firm diversifies by acquiring a new unrelated business, the optimistic investors of the focused firm may not be as optimistic on the value of the new business as they are on the value of the incumbent business. Accordingly, these optimistic investors would drop their valuations on the firm when the firm diversifies, and the heterogeneity of beliefs on the firm's value would be reduced between these optimistic investors and the other non-optimistic investors. Miller (1977) also suggests that, when investors with heterogeneous beliefs are subject to short-sale constraints, security prices would reflect the opinion of optimistic investors and sell at a premium over fundamental values. Thus, the higher the heterogeneity of beliefs between optimistic and pessimistic investors, the higher the stock price in equilibrium and the lower the subsequent stock return.¹ Following Miller (1977), we conjecture that the level of heterogeneous investor beliefs on a diversified firm is smaller than the sum of the levels of its subsidiaries if its subsidiaries could be traded separately in the public market. We also conjecture that the lower heterogeneity of investor beliefs on a diversified firm relative to its focused peers (i.e., the excess heterogeneity) contributes to the diversification

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¹ Using different proxies for the heterogeneity of investor beliefs, both Chen et al. (2002) and Diether et al. (2002) find that a firm's heterogeneity of investor beliefs is negatively associated with its future stock return.

discount. In particular, for a diversified firm, a lower excess heterogeneity of investor beliefs is associated with a lower contemporaneous excess value and an increase in the subsequent excess value relative to its focused peers.

We follow the literature and use analyst dispersion, stock trading turnover, idiosyncratic volatility, and breadth of mutual fund ownership to proxy for the firm-level heterogeneity of investor beliefs. We further construct the excess heterogeneity of investor beliefs in a diversified firm as the ratio of (or the difference between) the firm-level heterogeneity of investor beliefs to its imputed level, which is imputed based on the median heterogeneity of the focused firms in the segment industries. Based on these excess heterogeneity variables, we first study a firm sample consisting of both focused and diversified firms. We find that diversified firms, compared to focused firms, have a lower excess heterogeneity of investor beliefs, i.e., lower excess levels of analyst dispersion, share trading turnover, and idiosyncratic volatility, and a higher excess level of breadth of mutual fund ownership. Second, we study a merger sample consisting of diversifying and non-diversifying mergers. We find that the excess heterogeneity of investor beliefs on a bidder decreases from a pre-announcement window to a post-completion window if the bidder is a focused firm prior to its takeover and diversifies in its takeover. The reduction in diversifying mergers is greater than the reduction in non-diversifying mergers. Thus, our findings based on both the firm sample and the merger sample suggest that diversification reduces the heterogeneity of investor beliefs on a firm's value.²

Finally, we study how the reduced heterogeneity of investor beliefs on a diversified firm affects its firm value. Using the sample of diversifying firms, we find that the excess heterogeneity of a diversified firm is positively related to its contemporaneous excess value (relative to its industry peers) and negatively related to the future change in its excess value. We also study the sample of diversifying mergers. We find that the change in a bidder's excess values surrounding a diversifying merger is positively correlated with the change in the bidder's excess heterogeneity during the same time period. These results suggest that the conglomerate form of organization structure could affect a firm's value by reducing the heterogeneity of investor beliefs on the firm's value.

Our paper is related to the large literature on heterogeneous investor beliefs, including some recent papers in behavioral finance. As we discussed earlier, the literature was set forth originally by Miller (1977). Recently, Chen et al. (2002) develop a model showing that the heterogeneity of investor beliefs and the short-sale constraints cause equity overpricing. Scheinkman and Xiong (2003) and Hong et al. (2006) further study the asset trading and the asset pricing implications of heterogeneous beliefs (see also Mayshar, 1983, and Cao and Ou-Yang, 2009). Apart from the above theoretical work, many papers study empirically the impact of heterogeneous beliefs on subsequent stock returns (see earlier discussions).³ Different from these papers, our paper focuses on

one potential factor that could affect the heterogeneity of investor beliefs, namely the conglomerate structure of organization.⁴

Our study on the value implication of excess heterogeneous beliefs is also related to the large literature on the values of diversified and focused firms. There are two broad approaches in this literature. The first approach is to compare the overall value between diversified and focused firms. For example, Lang and Stulz (1994), Berger and Ofek (1995), and Servaes (1996) show that diversified firms on average exhibit a negative excess value relative to focused firms.⁵ The second approach focuses on the firm characteristics or macro factors that may affect the value difference between diversified and focused firms. For example, Rajan et al. (2000) and Scharfstein and Stein (2000) argue that the inefficiency of internal capital markets could affect the excess values of diversified firms (see also Yan, 2006, and Yan et al., 2010). Our empirical study on the relation between excess value and excess heterogeneity follows the second approach by focusing on a new firm characteristic, namely the heterogeneity of investor beliefs. Our paper extends the literature by suggesting a new channel of heterogeneous investor beliefs through which diversification could affect firm value.⁶

Many papers in the literature also study the relation between information asymmetry and diversification. On the one hand, diversified firms could have a higher level of information asymmetry because of its opaqueness. On the other hand, diversified firms could have more predictable earnings streams, more stable cash flows, and thus a lower degree of information asymmetry than focused firms. Empirically, Thomas (2002) and Clarke et al. (2004) use various information asymmetry variables and they show that diversification does not increase the degree of asymmetric information. Some of our heterogeneity variables, namely analyst dispersion, trading turnover, and idiosyncratic volatility, could be affected by information asymmetry. Our results on the negative relation between these variables and the diversification status are consistent with the argument that diversification reduces information asymmetry. However, we argue that the information asymmetry cannot explain some of our other results. For example, we find a positive relation between these variables and contemporaneous excess value. These findings seem to be inconsistent with the information asymmetry explanation, since firm value should increase with a reduced level of information asymmetry. In addition, our results based on breadth of mutual fund ownership are also unlikely to be driven by information asymmetry. Nevertheless, it is not our view that the heterogeneity of investor beliefs is the only difference between diversified and focused firms. Diversified and focused firms could be different in the other aspects such as the level of information asymmetry. In the paper, we choose to

² It is possible that the endogeneity of a firm's decision to diversify could affect our estimation of the diversification effect on the heterogeneity of investor beliefs. Specifically, a firm's decision to diversify could depend on some uncontrolled firm-specific characteristics which could also cause the firm to have a smaller level of heterogeneous investor beliefs. To address this issue, we test the robustness of our results using various simultaneous equation models, such as the instrumental variable (IV) regressions and the treatment-effect regressions. In the study on the merger sample, we also run the Heckman selection model to control for the potential selection bias of our merger sample. We show that our results on the reduced level of the heterogeneity of investor beliefs on diversified firms hold in these econometric models as well.

³ A number of empirical papers also focus on the impact of heterogeneous beliefs on corporate financing and investment decisions. See, e.g., Chatterjee, John, and Yan (2012) and Moeller et al. (2007) on the effect of heterogeneous investor beliefs on the pricing in mergers and acquisitions.

⁴ The previous studies, by studying the relation between heterogeneous beliefs and ex-post stock returns, have implications on how the level of heterogeneous beliefs affects the contemporaneous firm value. However, our study is different from these previous studies. The previous studies focus on the independent level of heterogeneity. In contrast, our paper focuses on the relative level of diversified firms that is relative to focused firms. Thus, our results are driven by not only the effect of heterogeneous beliefs on firm value but also the effect of diversification on the heterogeneity of beliefs. In an unreported robustness check, we show that excess heterogeneity is positively related to the contemporaneous excess value and negatively related to the future change in excess value even after we control for the unscaled heterogeneity of investor beliefs (that is not scaled by the imputed value). This finding suggests that the relations between excess heterogeneity and excess value are beyond the direct effect from the independent level of heterogeneous beliefs.

⁵ Some recent studies suggest that excess value could be a biased estimate of the value of diversification (see, e.g., Graham et al., 2002, Whited, 2001, Campa and Kedia, 2002, and Villalonga, 2004).

⁶ Cao et al. (2005) study a framework where investors with heterogeneous priors are averse to the uncertainty about the probability distribution of asset payoffs. They show that the level of heterogeneity in investors' priors affects the level of limited participation by investors and further affects the excess values of diversified firms. To some degree, our findings also provide support to the prediction in Cao et al. (2005).

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