Corporate Reputation and the Diversification Discount

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Abstract

Firms that are good at what they do tend to stick to that business. Consequently, corporate reputation (the market's perception of the firm's abilities) may suffer when firms diversify. It follows that, compared to the situation of complete information, firms are too prone to stick to their core business. This effect, which I call the *core business bias,* has important implications for the relation between diversification and value. Unconditionally, diversification is associated with a discount (good firms tend not to diversify). However, conditional on firm's characteristics, diversification is associated with a premium—an implication of the core business bias. This result is consistent with recent empirical findings on the relation between diversification and firm value.

1 Introduction

Does diversification create firm value? This important question has been addressed by many authors, both theoretically and empirically. In particular, recent empirical work by Campa and Kedia (2002) and Villalonga (2002) suggests that the comparison of firm value of diversifiers and non-diversifiers yields a positive or negative result depending on whether or not we control for firm characteristics. In this paper, I propose a simple theory that is consistent with these empirical findings; that is, a model that implies both the results $E(v|d = 1) < E(v|d = 0)$ and $E(v|r, d = 1) > E(v|r, d = 0)$, where v is firm value, d a diversification dummy, and r an indicator of firm characteristics.

Specifically, I investigate the relation between corporate reputation, diversification and firm value. By corporate reputation I mean the market's perception of the firm's abilities, in a world of imperfect, asymmetric information.[1] In such a world, the firm must balance the "direct" costs and benefits from diversification together with the "indirect" effects through changes in corporate reputation. In this context, I derive two results. First, I show that reputation leads to a bias in the firm's diversification decision. Since firms that are good at what they do tend to stick to that business, corporate reputation is harmed when firms diversify. In order words, firms that are very good in their core business tend to expand in that core business, and thus, in a world of imperfect information, expanding in the core business signals that the firm's ability is high. This in turn implies that *firms are too prone to stick to their core business*, compared to what would happen if there were no information asymmetries. I call this the *core business bias.*

I next examine the implications of this result for the relation between diversification and firm performance. I show that whether diversification is associated with a discount or a premium depends crucially on what expected

[1] Specifically, in this paper corporate reputation is the market's assessment of the firm's true value.

values are conditioned upon: unconditionally, diversification is associated with a discount; conditional on the firm's characteristics, however, diversification is associated with a premium. The unconditional diversification discount follows from the fact that it's the firms with lower ability that diversify. The diversification premium follows from the core business bias: reputation considerations imply that many firms do not diversify even though it would be efficient for them to do so.

The paper is organized as follows. In the next section, the basic model is laid out. In Section 3, I present two results regarding equilibrium firm strategies: (a) firms diversify if and only if their ability is lower than a certain threshold; (b) firms are too prone not to diversify (compared to the situation of complete information). Sections 4 and 5 introduce the central results in the paper, regarding the diversification discount and premium: $E(v|d = 1) < E(v|d = 0)$ and $E(v|r, d = 1) > E(v|r, d = 0)$. Finally, Section 6 presents additional implications of the results.

2 Model

The model focuses on a firm's choice between diversifying its business or expanding within its core. The model is very simple and is based on a number of extreme assumptions. However, the main ideas are fairly robust and would still hold in a more general context.

The timing of the model is as follows (see Table 1 for a summary). In period 1 ("beginning of time"), a manager is born and endowed with a business unit from a given industry. The value of the match between manager and industry is given by r. I normalize units so that the true value of the firm / business unit is r.[2] The value of r is the firm's private information, drawn from the commonly-known distribution $F(r)$ with average $\bar{r}$. The firm's market value is

[2]Throughout the paper, I will indistinctly refer to manager abilities and firm abilities. In fact, the model, simple as it is, can have different possible interpretations.

Table 1: Timing

$t = 1$	Firm is born with manager of ability r (in that industry), where r is drawn from $F(r)$.
$t = 2$	Market observes signal of r and forms posterior P.
$t = 3$	Firm chooses between diversifying ($d = 1$) or sticking to its core business ($d = 0$).
$t = 4$	Market updates posterior on manager's ability. Short-run firm value realized.
$t = 5$	Market learns true value of manager's abilities, which is reflected in firm's (long-run) value.

given by the market's estimate of r conditional on available public information. Therefore, while the firm's true value is given by r, the initial market value of the firm, assuming investors are risk neutral, is given by $\int_{-\infty}^{+\infty} r \; dF(r)$. In future periods, firm value may vary as a result of the addition of a new business unit or because of a change in the market's assessment of the firm's abilities.

Throughout the second period ("past"), information about the manager's ability is observed, leading to a posterior distribution $P(r)$ of the value of r. P therefore corresponds to the firm's corporate reputation.[3] Firm value is now given by $\int_{-\infty}^{+\infty} r \; dP(r)$ (the posterior average of r).[4]

In the third period ("present"), the firm must decide whether to expand within its core ($d = 0$), creating a second business unit of the same type, or whether to diversify ($d = 1$) by creating or acquiring a new, different business unit. Since the firm still possesses private information regarding the value of r, this decision has potential signalling effects, leading to a revised posterior regarding the value of r.

If the firm expands within its core business, then the manager's ability in

[3] In a particular version of the model that I consider below, the posterior P is based on the observation of a signal $s = r + \epsilon$. Both r and ϵ are normally distributed, so that P is normal with average $\frac{\sigma_r^2}{\sigma_r^2 + \sigma_\epsilon^2} \; s$.

[4] I assume the market receives unbiased signals of r, so that the expected value of $\int_{-\infty}^{+\infty} r \; dP(r)$ is equal to the true value of r.

the new business unit is still r. If however the firm follows a diversification strategy, then it effectively draws a new value r', the manager's ability in the new business activity. I assume that r' is distributed according to $F(r')$, independent of r, and unknown to the firm at the time the diversification decision is made.

Managers maximize a convex combination of short-run (fourth period) firm value and long-run (fifth period) firm value. Specifically, let δ be the weight given to the long-run value and $1 - \delta$ the weight given to short-run value.

As mentioned above, firm value in each period is determined by its reputation, that is, the market's assessment of the manager's ability in the particular industry/industries in which it operates. Specifically, in the fourth period ("short run"), firm value is equal to $2 \int_{-\infty}^{+\infty} r \; dP'(r)$ if the firm expands in its core business. P' is the posterior that results from P and the news that the firm expanded in its core business. (Since it is common knowledge that ability is the same in both business units, the value of reputation is the same for both business units.) If the firm diversifies, however, then short-run value is given by $\int_{-\infty}^{+\infty} r \; dP''(r) + \int_{-\infty}^{+\infty} r \; dF(r)$, where P'' is the posterior that results from P and the news that the firm diversifies.

Finally, in the fifth period ("long run") the value of r (and r', if applicable) becomes common knowledge. Firm value is then given by $v = r + r'$, if the firm diversifies, or $v = 2r$, if it does not diversify.

A summary of the model's notation is given in Table 2.

A strategy for the firm / manager is simply whether or not to diversify as a function of r and P. An equilibrium consists of a strategy that maximizes discounted firm value given a system of market beliefs, and a system of market beliefs that is consistent with the firm's strategy and with Baye's rule.

Table 2: Notation.

r, r'	Manager's ability in first and second (if applicable) industry.
r^*	Critical value of r (cf Proposition 1).
$\bar{r}$	Average value of r (of new business unit).
d	Diversification dummy.
v	Long-term firm value.
δ	Discount factor.
F	Prior distribution of r.
P	Posterior distribution of r.

3 The core business bias

In this section I establish two basic results regarding the manager's strategy of whether or not to diversify. First I show that an equilibrium strategy must be a "threshold" strategy, whereby the manager diversifies if and only if its ability in the current activity is sufficiently low. Second, I show that this threshold is lower than under complete information.

Lemma 1 (threshold strategies) *Equilibrium strategies are to diversify if and only if* $r < r^*(P)$.

Proof: Expected discounted payoff from staying with the core business, conditional on r and a particular reputation history, is given by

$$2\left((1-\delta)\int_{-\infty}^{+\infty} r \; dP'(r) + \delta r\right).$$

Expected discounted payoff from diversification is in turn given by

$$(1-\delta)\left(\int_{-\infty}^{+\infty} r \; dP''(r) + \int_{-\infty}^{+\infty} r \; dF(r)\right) + \delta\left(r + \int_{-\infty}^{+\infty} r \; dF(r)\right).$$

Therefore, the incremental payoff from diversification, conditional on a given reputation history P, is given by $\Delta = \chi - \delta r$, where χ is not a function of r. It follows that, in equilibrium, there must be a value r^* such that the payoff from diversification is positive if and only if $r < r^*$. ∎

In words, if a firm's ability in its current business is greater than some threshold value, then it will stick to its core business. If it is lower, then the firm diversifies.[5]

Before proceding, it may be worth noting that, in a world with no asymmetric information, the firm would diversify if and only if $r < \bar{r}$. In fact, by diversifying the firm expects, on average, $r = \bar{r}$. I now show that, under incomplete information, the firm is more reluctant to diversify than under complete information. As in Lemma 1, let $r^*(P)$ be the equilibrium threshold below which a firm decides to diversify.

Proposition 1 (core business bias) $r^*(P) < \bar{r}$.

Proof: Suppose that $r^*(P) \geq \bar{r}$. A firm with reputation P and ability $r = r^*(P)$ is indifferent between diversifying and not diversifying. In terms of long-run value, sticking to the core business is better than diversifying. Moreover, according to the equilibrium strategy, by diversifying the firm acquires a reputation of P' in its initial business and F in its new business, where the posterior P' results from P and the information that $r < r^*(P)$. By not diversifying, the firm acquires a reputation P'' which results from P and the information that $r > r^*(P)$. Clearly, P'' dominates P' (in the sense of first-order stochastic dominance). Moreover, since $r = r^*(P) \geq \bar{r}$, P'' also dominates F. It follows that, in terms of short-term payoffs, the firm is strictly better off by not diversifying. That is, no diversification is better both in terms of short-term and long-term payoffs—a contradiction. ∎

In words, there is a bias in favor of staying with the core business even when that is not "efficient" (that is, even when diversification would take

[5]Notice that the result is silent regarding uniqueness of equilibria. However, for the purpose of this paper, the important feature is that all equilibria be monotone as described in Lemma 1.

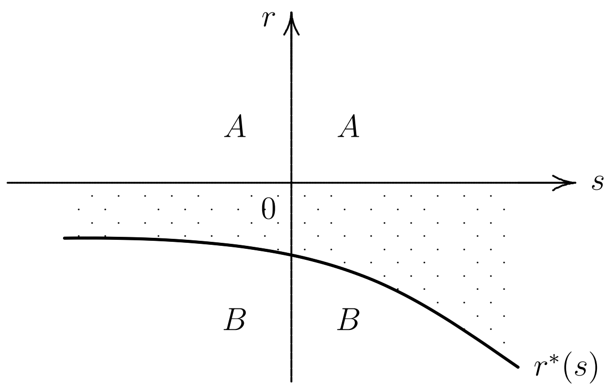

Figure 1: Equilibrium in the Normal case ($\sigma_\epsilon = .04, \delta = .7$).

place under complete information).

Consider the specific case when r is normally distributed and the market receives a signal of r, specifically $s = r + \epsilon$, where ϵ is also normally distributed. Figure 1 illustrates Proposition 1 for this case. Notice that s is a sufficient statistic of P, the posterior on the value of r. We can thus draw the equilibrium strategy on the (r, s) map. This is given by $r^\star(s)$, the threshold below which the firm diversifies. Under complete information, the firm would diversify if and only if $r > 0$; that is, $r^*(s)$ would be equal to zero. Under incomplete information, however, the value of $r^\star(P)$ is less than zero. Specifically, if $r^\star(s) < r < 0$ (shaded area), then the firm does not diversify (in equilibrium), whereas it would under complete information.

4 Diversification discount

I now show how my model can easily account for the empirical observation of an unconditional diversification discount. The key to this result is Lemma 1, the fact that firms that diversify have lower ability than firms that do not diversify.

Proposition 2 (diversification discount) *If δ is sufficiently high, then $E(v|d = 1) < E(v|d = 0)$.*

Proof: If δ is very close to one, then firms make decisions solely based on expected long-run value. The optimal decision is then to diversify if and only if $r < \bar{r}$. This implies that the expected value of diversifiers is approximately equal to the expected value of r given that $r < \bar{r}$ plus the unconditional expected value of r; whereas the expected value of non-diversifiers is equal to two times the expected value of r given that $r > \bar{r}$. Formally,

$$\begin{aligned}
\lim_{\delta \to 1} E(v|d=1) &= 2\left(1 - F(\bar{r})\right) \int_{\bar{r}}^{+\infty} r \, dF(r) \\
&> F(\bar{r}) \int_{-\infty}^{\bar{r}} r \, dF(r) + \int_{-\infty}^{+\infty} r \, dF(r) \\
&= \lim_{\delta \to 1} E(v|d=0),
\end{aligned}$$

from which the result follows. ■

The intuition for this result is quite simple. If, as Lemma 1 indicates, firms diversify if and only if $r < r^*$, then the average value of r for a diversifier is lower than the average value for a non-diversifier; and the result follows. The reason why the result is not trivial is that, by Proposition 1, there is a range of values of r such that, in the long-run, diversifiers perform better than non-diversifiers.[6] The assumption that δ is close to one implies that the bias underlying Proposition 1 is negligible, so that the basic effect described above dominates. An alternative version of the result dispenses with the assumption on δ. The result holds if the prior distribution of r is Normal and the posterior is based on the observation of a signal s that is equal to r plus Normal noise.

5 Diversification premium

The result of a diversification discount is not very surprising given the structure of the model. It is also not entirely novel; see for example ???. What is

[6] For $\delta < 1$, there exists a sufficiently small ϵ such that, if we restrict ourselves to the interval $[r^* - \epsilon, r^* + \epsilon]$, then the long-run expected value of diversifiers is greater than the long-run expected value of non-diversifiers.

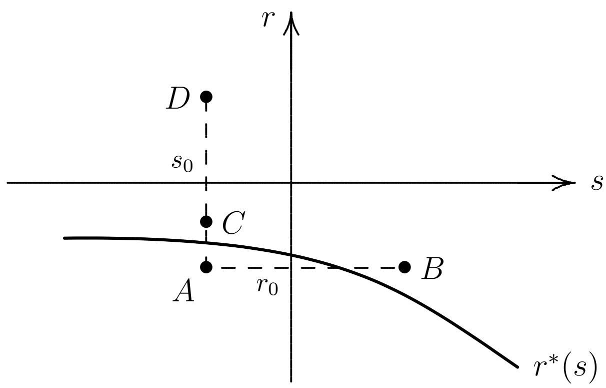

Figure 2: Diversification discount conditional on r (e.g., $r = r_0$) and conditional on s (e.g., $s = s_0$).

perhaps more interesting is how, by appropriately conditioning, a divesification premium may obtain. In this section, I present two different diversification premium results, one conditioned on information available to the market in the long-run, one conditioned on information available to the market at the time of the diversification decision.

Proposition 3 (diversification premium) $E(v|r; d = 1) > E(v|r; d = 0)$.

Proof: Long-run expected value conditional on r is given by

$$\begin{aligned} E(v|r; d = 1) &= r + \int_{-\infty}^{+\infty} r \, dF(r) = r + \bar{r} \\ E(v|r; d = 0) &= r + r. \end{aligned}$$

From Proposition 1, $d = 1$ only if $r < \bar{r}$. The result follows. ■

In words, the proof of Proposition 3 works as follows. Firms with positive r never diversify. Firms with negative r diversify if and only if their r is lower than the threshold value $r^*(P)$. Since this critical level depends on the particular reputation history of the firm (summarized by P), a cross section of different firms will pick up, for a given $r < 0$, both firms that diversify (firms with an s such that $r < r^*(s)$); and firms that do not (firms with an s such that $r > r^*(s)$). But all of these firms have $r < 0$, which implies that it is efficient to diversify. Therefore, a regression that controls for r will indicate a positive effect of the diversification dummy.

Figure 2 illustrates Proposition 3. As before, $r^*(s)$ denotes the equilibrium threshold below which a firm will diversify. Under complete information, that threshold would be given by $r^* = 0$, but under incomplete information we have $r^*(s) < 0$. It follows that there are values of r, e.g. r_0 in Figure 2, such that for different value of s the firm diversifies or does not (e.g., points A and B). In terms of long run value, a diversifier will get $(r_0 + \bar{r})/2$, whereas a non-diversifier gets $2r_0$. Since $r_0 < \bar{r} = 0$, it follows diversifiers do better. We thus obtain a (conditional) diversification premium.

The empirical results cited in Section 1 estimate a diversification premium by conditioning on information publicly available at the time of the diversification decision. However, the value of r is only observed in the long run. An interesting question is then whether a conditional diversification premium can be obtained solely based on the information that leads to the posterior P. Continuing with the normal case, this amounts to the expected value of v conditional on the diversification decision and on the value of s. See Figure 2, where I take a particular value of s, viz. s_0. Consider two firms with values of r close to $r^*(s_0)$, one with a higher, one with a lower value; this corresponds to points A and C in Figure 2. From Lemma 1, Firm A will diversify, whereas Firm C will not. Since the values of r are approximately similar, it follows that Firm A will have a greater long-term value. We thus get a diversification premium. Consider however Firm D. This firm, like Firm C, does not diversify. However, its long term value is certainly greater than Firm A's, simply because its value of r is higher.

The distribution of r conditional on s is centered on s. Suppose that $r^*(s_0) \approx s_0$, that is, approximately one half of the firms diversify. Then we would expect the density of firms around D to be much lower than around

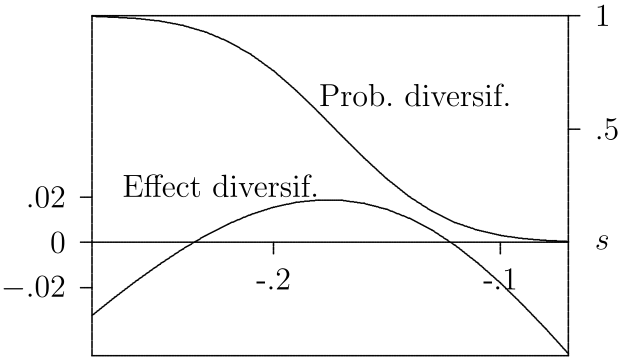

Figure 3: Probability of diversification (right scale) and diversification discount/premium (left scale) conditional on s. In this simulation, $\delta = .9$ and $\sigma_\epsilon = .04$.

A and C, so that the diversification premium result obtains. In other words, conditional on the values of s for which there is a lot of variation in the diversification decision, we would expect a diversification premium to prevail. This suggests my second result on the conditional diversification premium:

Proposition 4 (diversification premium) *Suppose that F, P are Normal. Let $\hat{s}$ be such that $\hat{s} = r^*(\hat{s})$. There exist ϵ_1, ϵ_2 such that, if $s \in [\hat{s} - \epsilon_1, \hat{s} + \epsilon_1]$ and $\sigma_e < \epsilon_2$, then $E(v|s; d = 1) > E(v|s; d = 0)$.*

Proposition 4 is somewhat restrictive in that it only applies to a subset of values of s. However, numerical simulations suggest that a weighted average of the diversification effect for all values of s would also indicate a premium. This is illustrated in Figure 3, where I plot the probability of diversification and the effect of diversification, both conditional on s. For very high or very low values of s, the effect of diversification is negative. The reason is that there is a sharp difference between the expected value of r of diversifiers and the expected value of r of non-diversifiers. Effectively, we are picking up the effect characterized by Proposition 2. For intermediate values of r (that is, values such that the probability of diversification is close to $\frac{1}{2}$), the effect of diversification is positive; that is, the positive effect of the diversification decision outweighs the fact that diversifiers have a lower r than non-diversifiers.

From a statistical point of view, the cases of extreme values of s should not be given much weight. In fact, the fraction of diversifiers is very low (high values of s) or very close to one (low values of s). The cases with greater statistical relevance are those where the fraction of diversifiers is approximately equal to the fraction of non-diversifiers. Figure 3 suggests, as is the case, that the the value of diversification weighted by $\left|p - \frac{1}{2}\right|$, where p is the conditional probability of diversification, is positive.

In Villalonga (2002), firms are classified according to classes of propensity to diversify. The average effect of diversification is then computed by computing the average values of diversifiers and non-diversifiers in each class and weighing each difference by the propensity to diversify of that class. Since propensities to diversify are all lower than $\frac{1}{2}$, this effectively corresponds to the weighted average I suggest in the previous paragraphs. My results are therefore consistent with the finding of an average diversification premium.

6 Discussion and final remarks

I have shown that my model is consistent with two stylized facts from the empirical literature: (i) unconditionally, diversified firms trade at a discount; (ii) controlling for firm characteristics, diversifiers trade at a premium (in the long-run). The model has other implications, which I now discuss.

From an empirical point of view, the model implies that prior to the diversification decision, diversifiers trade at a discount with respect to non-diversifiers. The reason is that initial reputation is correlated with r, and so is the likelihood of diversification. The negative correlation between diversification and firm value, even prior to the disversification, is consistent with the empirical evidence presented in Lang and Stulz (1994), Servaes (1996), Hyland (1999), Campa and Kedia (1999), and Villalonga (1999). Weston and Mansinghka (1971) and Gort, Grabowski, and McGuckin (1985) find lower accounting profits for conglomerates prior to diversifying.

A additional empirical implication of the model is that market value reacts negatively to the diversification announcement. This follows directly from the negative signalling effect associated with the diversification decision. The empirical evidence on this issue is mixed. Matsusaka (1993) and Hubbard and Palia (1998) find that, during the 1960s, bidder announcements of diversifying takeovers had a positive effect. For the 1980s, however, the evidence is mixed. See Morck, Shleifer, and Vishny (1990), Kaplan and Weisbach (1992), and Hyland (1999).

Previous results on the relation between diversification and firm value have frequently been interpreted in a causal sense, that is, in the sense that diversification implies a discount or a premium, depending on the sign of the econometric estimate. According to this paper (and other related models), the diversification discount is an equilibrium phenomenon, not the result of poor business strategy; it's a case of correlation, not causality. In this sense, the implication for strategy is that there is no implication.

The distinction between correlation and causality has been highlighted in previous papers on the diversification discount. Differently from these papers, I also provide an explanation for a diversification premium. Because of short-run concerns with corporate reputation, firms may be unwilling to diversify when this would be optimal from the point of view a long-term firm value. In this sense, if we believe that managers place too much weight on short-run firm value, then firms should diversify more than they do in equilibrium.

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Note: this list is still very incomplete. I will be grateful for suggestions of additional papers that I should reference here.

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