Living Up To Expectations: Corporate Reputation and Sustainable Competitive Advantage

Luís Cabral
New York University and *CEPR*

This draft: October 2012

Abstract. I develop a theory of corporate reputation as a source of sustainable competitive advantage. I show how a relatively simple and reasonable assumption regarding the dynamics of corporate reputation leads to a self-reinforcing process whereby cross-firm differences in corporate reputation (and performance) are significant and relatively permanent. Numerical simulations suggest that persistence in cross-firm differences is largely due to endogenous investment incentives: firms with higher corporate reputation invest more in corporate reputation. I provide a series of examples consistent with the model's prediction.

W R Berkley Term Professor of Economics, Stern School of Business, New York University; Research Fellow, IME and PPRC (IESE); and Research Fellow, CEPR; luis.cabral@nyu.edu. I am grateful to Bruno Cassiman, David Collis and Avi Goldfarb for suggestions; and to seminar participants at Harvard Business School and NYU for comments on a preliminary draft. Clare Finnegan provided excellent research assistance. The usual disclaimer applies.

1. Introduction

Different firms perform differently, even within the same industry; and performance differences are fairly persistent over time (Mueller, 1977; Jacobsen, 1988; McGahan and Porter, 1999; Glen, Lee and Singh, 2003; Moskowitz and Grinblatt, 1999). Why? One of the central questions in strategy — arguably the central question — is precisely the origin and nature of sustainable competitive advantage (Porter, 1985; Rummelt, 1984). As Saloner, Shepard and Podolny (2001, p. 40) aptly put it, this is "the field's version of the search for the Holy Grail."

In this paper, I develop a theory of corporate reputation as a source of sustainable competitive advantage. My contribution is twofold. First, I show how a relatively simple and reasonable assumption regarding the dynamics of corporate reputation leads to a self-reinforcing process whereby cross-firm differences in corporate reputation (and performance) are significant and relatively permanent.

Second, in explaining the nature of sustainable competitive advantage, I make the distinction between "success breeds success" and "success breeds drive to succeed." This distinction, I argue, is not purely semantic. In fact, I show that were firms to imitate each other's investment strategy (which I assume they can) then the persistence of competitive advantage would be considerably lower than in equilibrium. It follows that the main source of sustainable competitive advantage lies in endogenous investment incentives: better firms have greater incentives to invest in the resource underlying competitive advantage, which in my model is given by corporate reputation.

The paper is organized as follows. In Section 2 I present the model and the main results verbally. Section 3, by contrast, takes a formal approach to the model's ingredients, assumption and results. In particular, I show that firms with higher levels of corporate reputation invest more in corporate reputation, which results in permanent differences in performance across firms. In Section 4 I calibrate the model to reproduce empirically observed patterns of firm performance. I then simulate the model and argue that an important portion of persistence in firm performance is due to the endogenous investment incentives derived from the theoretical model. In Section 5 I present a series of examples that illustrate the paper's central idea. Section 6 concludes the paper.

■ **Related literature.** There are now many different frameworks to classify the sources and explain the mechanisms leading to sustained competitive advantage: some contrast internal and external factors (Wernerfelt, 1984), some contrast position and capabilities (Saloner, Shepard and Podolny, 2001), some contrast static and dynamic differences (Teece, Pisano and Shuen, 1997), some stress the routine nature of firm decisions (Nelson and Winter, 1982). These and other frameworks are part substitutes, part complements; they frequently overlap and at times can be seen as different ways of explaining the same phenomenon.

One of the most common lines of argument for sustained competitive advantage is that firm success is based on resources that are both unique and difficult to transfer from firm to firm (Wernerfelt, 1984; Barney, 1986; Dierickx and Cool, 1989). There are many reasons why resources cannot flow easily. Of particular importance is the concept of causal ambiguity (Lippman and Rumelt, 1982; Reed and DeFillippi, 1990): since there are myriad differences between corporations, it is difficult to pin down which ones are the cause of superior performance by the best.

An alternative explanation for sustainable competitive advantage stresses the dynamic process of resource accumulation, in particular the self-reinforcing dynamics that it may lead to. For example, Dierickx and Cool (1989) state that

> Sustainability will be enhanced to the extent that adding increments to an existing asset stock is facilitated by possessing high levels of that stock. The underlying notion is that "success breeds success": historical success translates into favorable initial asset stock positions which in turn facilitate further asset accumulation (p. 1507).

Consistently with this previous literature, my theoretical model is based on two important ingredients: (a) idiosyncratic intangible firm resources (specifically, corporate reputation); and (b) the idea that persistence results from a dynamic self-reinforcing process. However, as mentioned above, I stress the important distinction between "success breeds success" and "success breeds drive to succeed" when studying this self-reinforcing process.

Previous authors have also stressed the importance of corporate reputation as a source of sustained competitive advantage. Specifically, Barney (1986) suggests corporate reputation as an application of his strategic factor markets framework. However, as pointed by Dierickx and Cool (1989), it is not clear that resources such as corporate reputation can actually be acquired. An alternative view is that corporate reputation creates a first-mover advantage (Schmalensee, 1982). In this sense, my analysis suggests that a superior corporate reputation may be thought of as a "first-mover" advantage: by leading its owner to further invest in reputation, it cements reputation differences with respect to less reputed competitors.

2. Informal exposition of model and results

In this section I present the model and the main result in a verbal manner, leaving mathematical details for later. I assume that a firm's performance depends on its reputation, and that reputation depends stochastically on the firm's effort to improve its reputation. In other words, a firm that spends more resources in improving its reputation is more likely to obtain a positive reputation shock; but regardless of a firm's investment, both positive and negative shocks are possible.

The model's fundamental assumption is that, reputation-wise, a firm has more to lose from falling short of what's expected from it than it has to gain from exceeding expectations. Later I consider a specific mathematical equation with these features, but my main result only requires that reputation be updated in this asymmetric fashion. Since this is a fundamental assumption in the paper, I later argue that it is consistent with the received economic theories of reputation.

It can be shown that the above assumption implies that the firm's optimal strategy is to invest more when its reputation is higher: the firm must live up to expectations. It's not that higher reputation firms have a better "technology" for investing in reputation. Rather, the firm's incentives to maximize value are such that, in equilibrium, higher reputation firms want to invest more.

In this context, persistence takes place not only because reputation itself is persistent but also because the incentives to invest in reputation are aligned with the level of reputation.

In other words, it's not just a case of "success breeds success" but also "success breeds incentive to invest in further success" or "success breeds drive to succeed."

Mathematically, this result is established for a limited set of parameter values. Moreover, the result only establishes that there exists a self-reinforcing effect through firm strategies; no claim is made regarding the magnitude of the effect. For these reasons, the analysis proceeds to proposing a series of functional forms and calibrating the model using actual time series data. I choose the case of the Pepsi-CocaCola duopoly and obtain data from Compustat to build an index of relative performance. The model has three parameters, which I calibrate by using three moments from the Pepsi-CocaCola time series: mean, variance and one-period-lagged autocorrelation. Based on the calibrated model, I show that the theoretical effect explains a substantial portion of persistence in relative performance. For example, I estimate that my central result explains 72% of the correlation between performance at time t and performance at time $t-5$, the remaining 28% corresponding to the "success breeds success" effect implicit in the "natural" persistence of reputation.

The next two sections develop the above arguments in a formal and detailed manner. After that, in Section 5 I turn to a series of examples that illustrate the main result that "success breeds drive to succeed."

3. Basic model and assumptions

I now present the model and results in a formal manner.

■ **Main ingredients.** The main ingredients of the model are as follows. In each period, a firm is characterized by its reputation, r_t. Reputation is a function of the firm's past reputation and performance. Specifically, r_{t+1} is given by $r_{t+1}(q_t; r_t)$, where q_t is the quality of the firm's product in period t. The quality of a firm's product at time t, q_t, is a stochastic function of the effort e_t that the firm puts into its product: $q_t \sim F(\cdot \mid e_t)$.

I assume that, in each period, a firm's revenues are proportional to its reputation. Net revenues are obtained by subtracting the cost of investment in reputation. With no additional loss of generality, I assume period profits are given by $r_t - C(e_t)$, where $C(e_t)$ is the cost of effort function which I assume satisfies the conditions $C' \geq 0, C'' \geq 0$ and $C'(0) = 0$.

■ **Main assumption.** The central assumption of the paper is that negative surprises to a firm's reputation are punished more severely than positive surprises are rewarded.

Assumption 1.

$$\text{abs}\left(\frac{d\, r_{t+1}}{d\, q_t} \,\middle|_{\, q_t < r_t} \right) > \text{abs}\left(\frac{d\, r_{t+1}}{d\, q_t} \,\middle|_{\, q_t > r_t} \right)$$

Because this assumption plays such a central role in the paper, it is worth spending some time justifying it. I could have developed a complete structural model of firm reputation and derived the mapping $r_{t+1}(q_t; r_t)$ endogenously. In doing so, I would need to opt for a particular theory of reputation, which would reduce the generality of the results below considerably.

Broadly speaking, there are two economic models of reputation: one developed by Klein and Leffler (1981), among others, is based on a repeated game played between a firm and consumers; a second one, pioneered by Kreps, Milgrom, Roberts and Wilson (1982), is based on a game between a privately informed player (e.g., a firm) and a Bayesian updating audience (e.g., consumers). There are also many other variations, which typically combine aspects of the repeated-game and of the incomplete information approaches.[1]

Many if not most of these reputation (or trust) models are consistent with Assumption 1. Consider for example the Klein and Leffler (1981) framework. In equilibrium, consumers expect the firm to produce at quality level $\bar{q}$. If the firm supplies q or higher, then it maintains its reputation intact; if however the firm produces at a quality level lower than $\bar{q}$, then consumers stop trusting the firm, instead expecting the firm to produce at the lowest quality level (say, zero). Given such grim expectations (and willingness to pay), the firm has no better choice than to produce low quality products, thus justifying the consumers' equilibrium expectations. In sum, we have

$$r_{t+1} = \begin{cases} \bar{q} & \text{if} \quad q_t \geq \bar{q} \\ 0 & \text{if} \quad q_t < \bar{q} \end{cases}$$

Notice that this equilibrium reputation updating process is consistent with Assumption 1, if to a somewhat extreme degree.

Consider now a model in line with Kreps, Milgrom, Roberts and Wilson (1982). A fraction ρ_0 of all firms are of a "good" type: their products "work" with probability one. A fraction $1 - \rho_0$ of all firms are of a "bad" type: they sell products that work with probability e_t, where $e_t \in (0, 1)$ measures the firm's effort to produce quality products. In this context, the firm's reputation corresponds to the buyer's belief that the product works: $r_t = \rho_t + (1 - \rho_t)\,\hat{e}_t$, where ρ_t is the posterior that the firm is "good" and $\hat{e}_t$ is the buyer's belief regarding the firm's effort level.

In this context, the firm's reputation can be updated in two ways. If the product works in the current period, then consumers are positively "surprised" by $1 - r_t$, and the firm's reputation increases from r_t to r_{t+1}, at a rate

$$\frac{r_{t+1} - r_t}{1 - r_t} < 1$$

If however the product does not work in the current period, then consumers are negatively "surprised" by $0 - r_t$, and the firm's reputation drops to 0, at a rate

$$\frac{0 - r_t}{0 - r_t} = 1$$

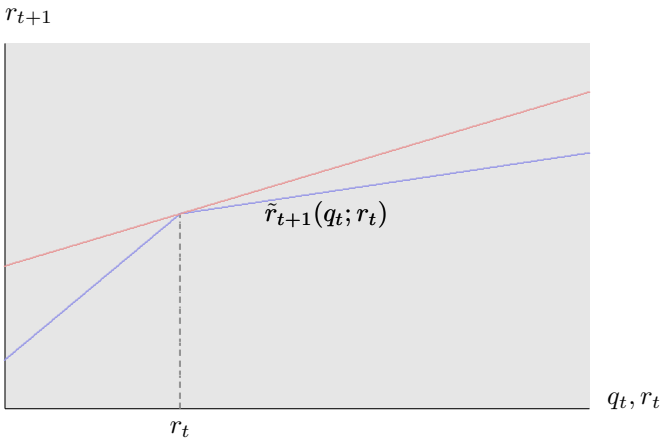
Again, this is consistent with Assumption 1.

■ **Main result: Success breeds drive to succeed.** I now come to the paper's central result.

Proposition 1. *If r and $d\,r_{t+1} / d\,q_t \,|_{\,q_t > r_t}$ are sufficiently small, then q is strictly increasing in r.*

1. In Cabral (2005), I argue that the Klein-Leffler approach is best described as a theory of trust, not reputation. However, the practice of most scholarly work seems to use the term reputation indistinctly.

Figure 1
Reputation updating function.



Proof of Proposition 1: The Bellman equation is given by

$$V(r_t) = \max_e \; r_t - C(e) + \delta \int_0^\infty V\big(r_{t+1}(q; r_t)\big)\, f(q \,|\, e)\, dq \tag{1}$$

Suppose that $r = 0$ and $d\, r_{t+1} \,/\, d\, q_t \,|_{\, q_t \,>\, r_t} = 0$. Then the marginal return to effort is zero, that is, the integral on the right-hand side of (1) is constant with respect to e. This implies that the marginal cost of effort is negative, thence $e^\star = 0$. If r is positive and small, however, then the marginal return to effort is positive. Since the marginal cost of effort is zero at $e = 0$, it follows that the optimal level of effort is strictly positive. The result then follows by a continuity argument. ■

In words, Proposition 1 states that, in equilibrium, the firm's strategy is to live up to expectations: the higher its reputation is, the greater its investment in reputation.[2] This in turn creates an additional channel for persistence: firms with higher reputation, by investing more in reputation, tend to persist as firms with higher reputation.

Strictly speaking, Proposition 1 is only valid for an infinitesimal set of values of r. In order to find out how the result extends to other values of r (and less extreme reputation updating mappings), I next simulate the model numerically.

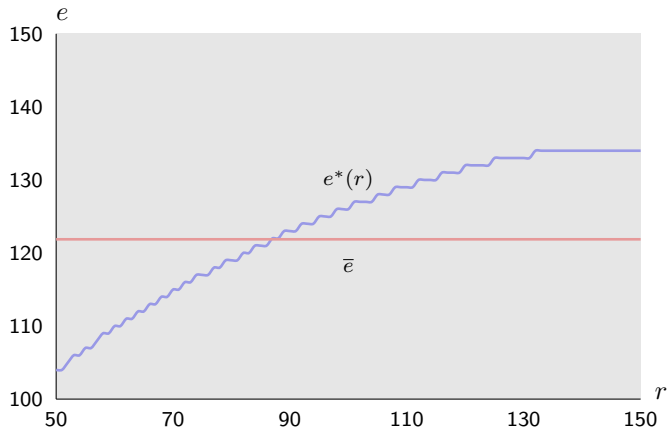
4. Simulation and calibration

I now turn to the calibration and simulation of my theoretical model. This exercise has two goals in mind. First, I want to examine to what extent the monotonicity result of Proposition 1 extends beyond the limited set of parameter values that the result is based on. Second, by calibrating the model I can determine how important in practice is the idea that endogenous investment incentives lead to sustained competitive advantage.

I now assume that the reputation updating function is given by

2. From a game theory point of view, Proposition 1 resembles the results in Diamond (1989), who shows that borrowers with a higher reputation have a greater incentive to protect their reputation as good borrowers.

Figure 2
Optimal firm strategy, $e^*(r)$, and conterfactual constant effort leading to same average reputation level, $\overline{e}$.



$$r_{t+1} = r_{t+1}(q_t; r_t) = \begin{cases} q_t & \text{if} \quad q_t < r_t \\ \lambda\, r_t + (1-\lambda)\, q_t & \text{if} \quad q_t > r_t \end{cases} \tag{2}$$

where $0 < \lambda < 1$. I also assume that $q_t = e_t + \epsilon_t$, where ϵ_t is normally distributed;[3] and that the effort cost function is given by $C(e) = \phi\, e^2$, where ϕ is a scaling parameter.

The blue line in Figure 1 plots the reputation updating function given by (2). The pattern reflects the paper's main assumption (Assumption 1): positive surprises are rewarded at a lower rate than negative surprises are punished. A higher value of λ corresponds to greater consumer "skepticism:" even though consumers are "surprised" by higher performance than expected, they hardly update their future expectations regarding firm performance. In the limit when $\lambda = 1$, positive surprises go unrewarded (as in Klein and Leffler, 1981, for example).

The blue line in Figure 2 plots the equilibrium level of effort. The positive slope of $e^*(r)$ is consistent with the paper's main result (Proposition 1): the higher a firm's reputation, the more effort the firm will put into maintaining that reputation. While Figure 2 corresponds to a particular set of parameter values, the result that e^* is increasing in r is obtained for a wide range of parameter values.

■ **Calibration.** How relevant is the positive slope of $e^*(r)$? In other words, how much of the persistence in firm differences can be attributed to endogenous investment incentives? In order to answer this question, I next calibrate the model so as to reproduce "reasonable" parameters from a real-world industry. Specifically, I consider the CocaCola-PepsiCo duopoly. Recall that by appropriate choice of units, firm reputation is equal to firm performance. From Compustat I obtain time series data on earnings per share, my performance measure. In order to measure relative performance, I divide the PepsiCo by the CocaCola values and obtain the time series in Figure 3. I then compute three moments of this time series: average (μ), standard deviation (σ), and first-order autocorrelation (ρ). Finally, I

3. To be precise, I assume q and r and in $[\underline{r}, \overline{r}]$; and that ϵ is distributed according to a truncated normal, so that $q \in [\underline{r}, \overline{r}]$.

Figure 3
PepsiCo and Coca-Cola Co relative performance (earnings). Source: Compustat.

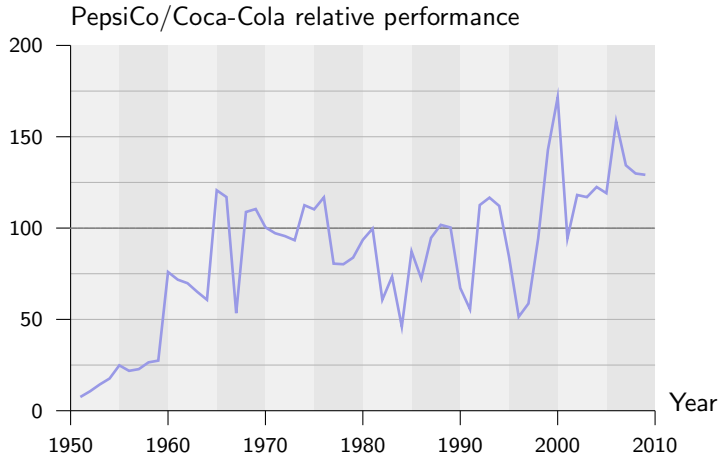
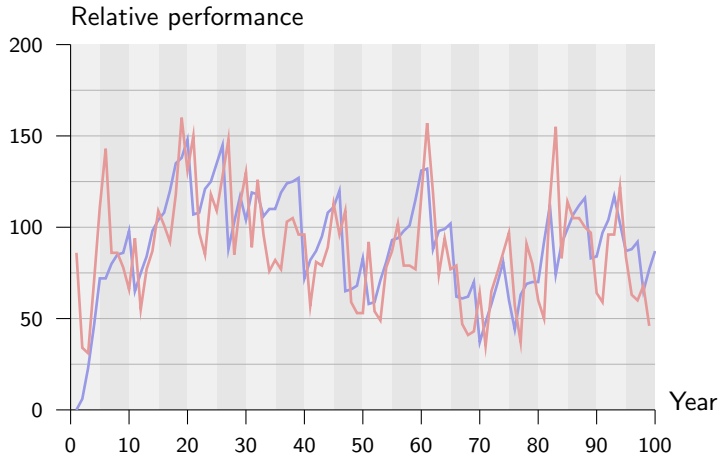


Figure 4
Reputation time path: equilibrium (blue) and counterfactual with constant effort and symmetric reputation updating (red).

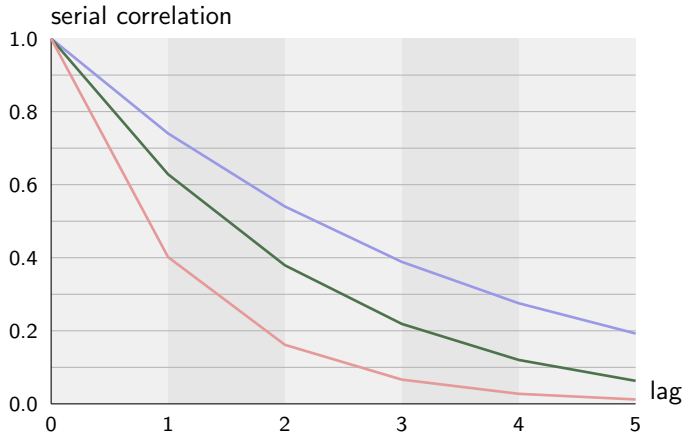


calibrate the model by choosing λ, ϕ and the standard deviation of ϵ so as to reproduce μ, σ and ρ.

I was able to reproduce μ and ρ exactly. However, the resulting value of σ is somewhat lower than the data. The blue line in Figure 4 depicts one random simulation from the calibrated model. Overall, the blue line in Figure 4 has a similar "feel" than the data plotted in Figure 3. Note that the present exercise is solely focused on reproducing three moments: mean, variance and autocorrelation. Judging the goodness of the fit should be based on the time series properties of Figures 3 and 4, not the precise values in each period. In this sense, the fit seems reasonably good.

■ **Counterfactual.** Having calibrated the model, I next consider a counterfactual where the reputation updating function is flat (no asymmetries) and firm effort is constant (no

Figure 5
Serial correlation of simulated firm performance under three alternative cases: (a) base case (blue), (b) constant firm effort (green), and (c) constant firm effort and symmetric reputation updating (red).



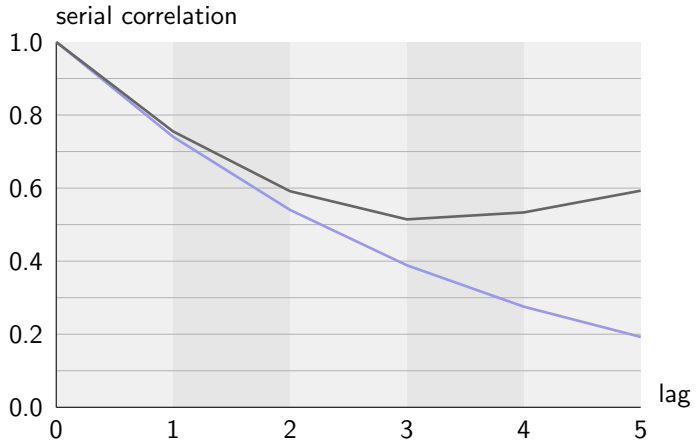
monotonicity, as in Proposition 1). Specifically, the red line in Figure 4 shows the time path of relative performance. As expected, this counterfactual time series exhibits lower autocorrelation, that is, less persistence. Note that the red line (counterfactual) still exhibits some persistence, in particular more persistence that an i.i.d. series with the same first two moments as the data. The persistence observed in the red line corresponds to what I previously referred to as "natural" persistence. Specifically, it is due to the fact that there is a "natural" inertia in the reputation updating process. The main point in the paper is that, *in addition* to this "natural" inertia, equilibrium incentives are such that firm strategy magnifies the level of inertia implied by reputation updating; thus the difference between the blue line and the red line in Figure 4.

■ **Correlogram analysis.** Autocorrelation is difficult to measure by direct inspection. Moreover, the above counterfactual changes two things simultaneously: it considers symmetric reputation updating *and* constant firm effort. In order to get a better idea of the time series properties of the various possible cases, as well as to understand the role played by endogenous firm effort, I now plot a series of correlograms, that is, the autocorrelation between r_t and r_{t-k} $(k = 0, 1, ...)$ for various time series.

Sustainable competitive advantage corresponds to a low-decay correlogram $C(l)$, where $l = 0, 1, ...$ is the lag. The extreme case of perfect sustainable competitive advantage would correspond to $C(l) = 1$ for all l. At the opposite end, the absence of sustainable competitive advantage corresponds to the case when $C(l) = 0$ for all $l > 0$. Every real-world industry lies somewhere between these extremes. How close is it to each extreme; and, more important, how much of the persistence is due to the endogenous effect described by Proposition 1?

Figure 5 plots the serial correlation of three time series of firm performance: (a) the base case (blue) (that is, correlogram of the time series in blue in Figure 4, where the moments mimic the time series of Pepsi-CocaCola relative performance); (b) constant firm effort (green), and (c) constant firm effort and symmetric reputation updating (red) (that is, the correlogram of the time series in red in Figure 4). The difference between the blue

Figure 6
Serial correlation firm performance under three alternative cases: (a) data (black), (b) model simulation (blue).



and the red lines corresponds to the contribution of endogenous effort to serial correlation; the difference between the green and the red lines corresponds to the contribution of asymmetric reputation updating. As the figure shows, both endogenous effort and asymmetric reputation updating play a role in increasing serial correlation.

We also observe that for long lags, say $k = 4$ or $k = 5$, a simple model with symmetric reputation updating and constant firm effort implies next to no serial autocorrelation. However, the calibrated model predicts a correlation of 0.2 or 0.3. Moreover, a substantial portion of this increase is due to endogenous firm effort. Even for $k = 2$ or $k = 3$ we observe a considerable increase in correlation explained by the model (i.e., the move from red to blue); and again, endogenous effort accounts for a considerable portion of this increase. In other words, the idea that "success breeds drive to succeed," more than a simple theoretical curiosity, seems to have considerable bite.

The correlogram analysis also allows me to go back and study the calibrated model fit. Figure 6 plots two correlograms, one (black line) from the PepsiCo/CocaColaCo data (the time series in Figure 3), and one (blue line) from the calibrated model. Recall that the model is calibrated so as to reproduce the first-order autocorrelation. It is therefore not surprising that the black and blue lines coincide for $k = 1$. For $k = 2$ and $k = 3$, the model does a reasonable job at replicating serial autocorrelation. However, the values for $k = 4$ and $k = 5$ suggest that — at least in the case of PepsiCo and CocaColaCo — the model under-predicts long-lagged auto-correlation.

5. Examples

I now turn to a few examples that illustrate the central theoretical result in the paper, namely that reputation investment incentives are increasing in reputation level.

■ **eBay seller reputation.** The first example is from eBay sellers. Cabral and Hortaçsu (2010) examine a panel of eBay seller histories and look at the impact of negative feedback given by buyers. They show that after a seller receives his first negative feedback, subsequent

negative feedback ratings arrive 25% more rapidly. Moreover, Cabral and Hortaçsu (2010) perform various tests that suggest buyer behavior does not play an important role in this pattern. Rather, they argue, the increase in the frequency of negative feedback is likely driven by seller behavior: a negative reputation shock implies lower effort, which in turn leads to more negative feedback. In this sense, the result is consistent with Proposition 1's prediction that reputation building effort is monotonic with respect to the level of reputation.

■ **Big oil CSR.**[4] A second example is given by Corporate Social Responsibility (CSR) by big oil companies. The world's "big five" oil companies are: BP, Chevron, ExxonMobil, Shell, and Total. At the risk of oversimplifying the recent history of their relation to the environment, we may say that there have been two major reputation shocks: (a) the Exxon Valdez disaster (1989), and (b) the Deepwater Horizon oil spill (2010).

Consistently with Proposition 1, until recently Exxon has had both (a) a worse reputation on environment matters and (b) a lower investment in environment protection:

> While Imperial Oil and its U.S. parent, Exxon Mobil Corp., have the worst reputation for environmental behaviour, other oil companies, such as British Petroleum and Royal Dutch/Shell, have a much better reputation (Crane, 2001).
>
> In general, the company literature of TotalFinaElf and ExxonMobil pays less attention to CSR than does that of BP and Shell ... BP and Shell appear to be more 'accepting' and 'responsive' than TotalFinaElf and ExxonMobil, across all our indicators (Skjaerseth et al, 2004).

In this context, my model would predict BP's environment commitment to decline post 2010: not only has the oil spill reduced BP's environmental reputation, it has also decreased BP's incentives to invest in this dimension of its corporate reputation.

Anecdotal evidence seems broadly consistent with this prediction. A full-page add on the June 30, 2011 edition of the *Financial Times*, paid by Greenpeace, asked: "Which businesses are backing Europe's green economy to win?" On the good side, the listed included Google, Acciona, Danone, Allianz, Ikea, Unilever, Sony, Eneco; on the No side, the listed include Volkswagen, BP, Beolia, Maersk, Rhodia, Accenture, ArcelorMittal. Although BP was the only oil company listed at all, it's significant that it was negatively identified as an environmentally unfriendly company.

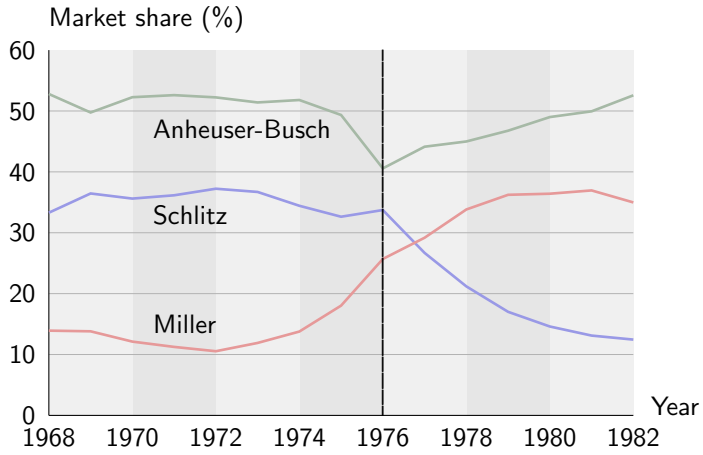
■ **The demise of Schlitz.**[5] Finally, another possible example of Proposition 1 at work is given by the demise of the Schlitz beer brand. In what follows I will stick to the basic facts that relate to the issues at hand; a fuller account may be found in Goldfarb (2007).

In 1976, without much prior testing Schlitz changed the preservatives it used in its beer (until 1976 Schlitz had been using silica gel). A problem occurred in the form of small green flakes that appeared in the beer. Schlitz claimed that this was an isolated problem and delayed recalls for months. Not surprisingly, the incident had a big negative impact on

4. I am grateful to Bruno Cassiman for suggesting this example.

5. I am grateful to Avi Goldfarb for suggesting this example. Avi Goldfarb and to David Collis generously shared data from the U.S. beer industry.

Figure 7
U.S. beer market shares, 1968–1982. Notes: shares add up to 100%, thus excluding other brands; the vertical line marks the "green flakes" event. Source: Goldfarb (2007).



Schlitz's reputation. As Figure 7 shows, beginning in 1976 Schlitz's market share declined steadily until the brand was finally discontinued in the early 1980s.

The green flakes incident was not the only event that adversely affected Schlitz's brand image. In the early 1970s, the company introduced a process of accelerated batch fermentation (ABF), leading rivals to refer to Schlitz derogatorily as "green beer." In the mid 1970s, Schlitz was involved in court litigation with the Department of Justice over alleged questionable sales practices (whereas the other breweries quickly settled their cases). During the period of declining market share, Schlitz initiated an advertising campaign of dubious quality. Perhaps more important, during the 1970s Schlitz suffered from the rapid growth of rival brand Miller.[6]

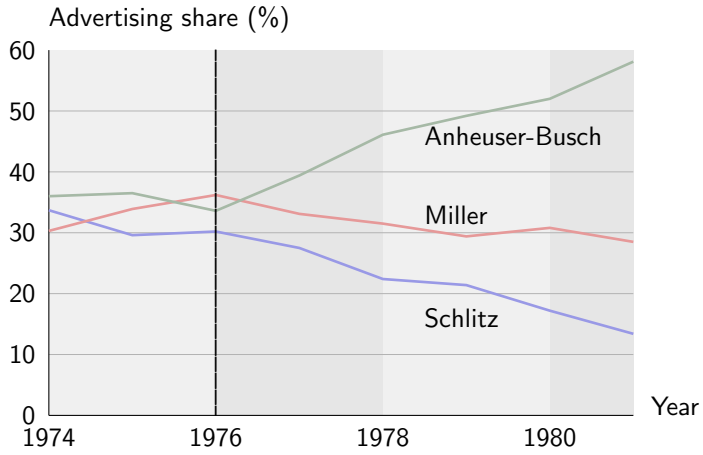
Whatever the main cause of the beginning of Schlitz's decline, the data is consistent with the idea that as the brand's performance worsened, the company's investment in it declined. Figure 8 plots the advertising market shares for the 1974–1981 period and shows a decline in Schlitz's share beginning precisely in 1976. Anecdotal evidence regarding Schitz's strategy seems consistent with this view: according to a former advertising manager at the failing beer company,

> Schlitz sacrificed its reputation in its pursuit of bigger profits (Neher, 1981).

This is consistent with Proposition 1. In fact, the mapping $e(r)$ suggests a trade-off between current profits and future reputation level: the higher $e(r)$, the lower the current profits but the higher the firm's future reputation. In this context, an increasing $e(r)$ mapping implies that firms with a lower reputation level will behave "as if" they were placing a greater weight on current profits (as opposed to future reputation).

6. In fact, Goldfarb (2007) argues that ultimately this was the main cause of Schlitz's demise.

Figure 8
U.S. beer advertising shares, 1974–1981. Note: shares add up to 100%, thus excluding other brands; the vertical line marks the "green flakes" event. Source: Collis (1986).



6. Discussion and conclusion

In this paper, I develop a theory of corporate reputation as a source of sustainable competitive advantage. A critical observation is that, when it comes to corporate reputation, "success breeds incentives to invest in success," that it, the equilibrium leads to a self-reinforcing mechanism whereby higher reputation firms continue as high-reputation firms for a long time, notwithstanding their rivals' ability to imitate.

I should note that not all scholars mean the same when they refer to sustainable competitive advantage. One common meaning is that of impossibility of competitive duplication (Lippman and Rumelt, 1982; Rumelt, 1984; Barney, 1991). My work suggests that sustainability may take place even when imitation is possible. In my model, a low reputation firm can rapidly become a high-reputation firm by investing heavily on reputation. However, in equilibrium the firm fails to do so because such move would increase reputation but decrease firm value. In other words, the differences in reputation persist for a long time as part of the heterogeneous equilibrium moves by heterogeneous firms. In this sense, my notion of sustainability is closer to that of Saloner et al (2001), who state that "when the sources of competitive advantage resist *competition*, the competitive advantage is said to be sustainable" (my emphasis).

Finally, I should also note that my paper can be viewed in the context of dynamic capabilities (Teece, Pisano and Shuen, 1997), the firm's ability to maintain and adapt the capabilities that form the source of its competitive advantage. According to Besanko, Dranove, Shanley and Schaefer (2004)

> Firms with strong dynamic capabilities adapt their resources and capabilities over time and take advantage of the new market opportunities to create new sources of competitive advantage (p 465).

I suggest that corporate reputation can be seen as a particular instance of this process: a firm that finds itself with a superior reputation for doing X should invest heavily in further building that reputation. A firm that has the ability to so possesses an important dynamic

capability and will succeed in the long run. In terms of my model, dynamic capabilities correspond to the ability to optimally choose e in each period. In fact, setting effort at a constant level we find that performance is lower and less persistent.

By means of model calibration and anecdotal examples, I argue that my central thesis — that success breeds the drive to succeed — has bite, that is, explains an important fraction of the observed persistence in firm performance. I conjecture that many more examples follow the same pattern. One example that is close to home is given by business school reputation. A comment heard at a faculty meeting in business school X went to the effect that "because we have a reputation as a finance school, we should invest primarily in the finance department." Not surprisingly, all other departments reacted by saying that precisely because their current reputation was below that of finance, a greater investment should be made to bring them to the same level. While the latter argument has certainly value, my theory suggests that, to the extent that school reputation plays an important role in its long-term performance, it may be a case when "to all those who have, more will be given" (Matthew 25:29).[7]

7. While my theory and Merton's (1968)"Matthew effect" theory share the same Scripture verse, I note that the nature of the effect is rather different.

References

Barney, J. B. (1986), "Strategic Factor Markets: Expectations, Luck, and Business Strategy," *Management Science* **42**, 1231–1241.

Barney, J. B. (1989), "Asset Stock Accumulation and Sustained Competitive Advantage: A Comment," *Management Science* **35**, 1511–1513.

Besanko, David, David Dranove, Mark Shanley, and Scott Schaefer (2004), *Economics of Strategy (Third Edition)*, New York: Wiley.

Cabral, Luís (2005), "The Economics of Reputation and Trust," New York University.

Cabral, Luís, and Ali Hortaçsu (2010), "The Dynamics of Seller Reputation: Evidence from eBay," *Journal of Industrial Economics* **58**, 54–78.

Collis, David J (1986), "The Value Added Structure and Competition within Industries," unpublished Ph.D. dissertation, Harvard University.

Crane, David (2001), "Corporate responsibility good for business," *Toronto Star,* October 9, 2001, E02.

Diamond, Douglas W (1989), "Reputation Acquisition in Debt Markets," *Journal of Political Economy* **97**, 828–862.

Dierickx, Ingemar, and Karel Cool (1989), "Asset Stock Accumulation and Sustainability of Competitive Advantage," *Management Science* **35**, 1504–1511.

Glen, J, K Lee, and A Singh (2003), "Corporate profitability and the dynamics of competition in emerging markets: a time series analysis," *The Economic Journal* **113**, 465–484.

Goldfarb, Avi (2007), "Why the Schlitz Hit the Fan," in Tremblay and Tremblay (Eds), *Industry and Firm Studies*, 4th Edition, 321–341..

Jacobsen, R. (1988), "The Persistence of Abnormal Returns," *Strategic Management Journal* **9**, 41–58.

Lippman, S, and R Rumelt (1982), "Uncertain Imitability: An Analysis of Interfirm Differences in Efficiency under Competition," *Bell Journal of Economics* **10**, 418–438.

McGahan, A, and ME Porter (1999), "The persistence of shocks to profitability," *The Review of Economics and Statistics* **81**, 143–153.

Merton, Robert K. (1968), "The Matthew Effect in Science," *Science* **159** (3810), 56–63.

Moskowitz, TJ, and M Grinblatt (1999), "Do industries explain momentum?," *The Journal of Finance* **54**, 1249-1290.

Mueller, Dennis C (1977), *Profits in the Long Run*, Cambridge: Cambridge University Press.

Neher, Jacques (1981), "Schlitz: Lost at Sea," *Advertising Age*, April, 49–52.

Porter (1980), *Competitive Strategy*, New York: Free Press.

Porter (1985), *Competitive Advantage*, New York: Free Press.

Ree, R, and R DeFillippi (1990), "Causal Ambiguity, Barriers to Imitation, and Sustainable Competitive Advantage," *Academy of Management Review* **15**, 88–102.

Rumelt, Richard (1984), "Towards a Strategic Theory of the Firm," in R Lamb (Ed), *Competitive Strategic Managemnt*, Englewook Cliffs,, NJ: Prentice-Hall, pp. 556–570. .

Saloner, Shepard and Podolny (2001), *Strategic Management*, New York: Wiley.

Schmalensee, Richard (1982), "Product Differentiation Advantages of Pioneering Brands," *American Economic Review* **72**, 349–365.

Skjaerseth, Jon Birger et al (Eds) (2004), "Limits to Corporate Social Responsibility: A comparative study of four major oil companies," The Fridtjof Nansen Institute.

Teece, D J, G Pisano, and A Shuen (1997), "Dynamic Capabilities and Strategic Management," *Strategic Management Journal* **18**, 509–534.

Wernerfelt, Birger (1984), "A Resource Based View of the Firm," *Strategic Management Journal* **5**, 171–180.

Wernerfelt, Birger (1989), "From Critical Resources to Corporate Strategy," *Journal of General Management* **14**, 4–12.