

On reputation and the interaction of firm and individual reputations*

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Abstract

I briefly review alternative modelling approaches to understanding reputation and show how these can be used and have been applied to consider reputations of individuals working in a firm. The focus is on models in which the firm reputation is informative about the type of an individual belonging to the firm. The selection of papers discussed is no doubt idiosyncratic and incomplete.

1 Introduction

In this note, I seek to draw together and categorize differing models pertaining to firm reputations and in particular I highlight those models that distinguish and discuss the difference between reputations of firms and of individuals. This survey is not exhaustive; however, I hope that it might prove useful.

The motivation for my interest in these models was a broader interest in professional services, such as law and consulting. In such markets which are essentially markets for credence goods (a term introduced by Darby and Karni (1973)), reputation clearly plays a crucial role. However, spin-offs in consulting (see for example Pinault (2001)), the importance of client control (Nelson (1988)) and increasing occurrence of lateral hiring in the

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legal profession (Trotter (1997)) highlight that individuals can develop reputations which differ from the reputations of the firms to which they belong. Moreover, in such industries, human capital is the critical factor of production. Much of the discussion in this note (and no doubt its coverage) may be strongly influenced by consideration of these industries.

Three different theoretical approaches for modelling reputation, which highlight different aspects of reputation are introduced and discussed. These approaches underlie much of the subsequent discussion which focuses on issues surrounding the interaction of individual and collective reputations. After introducing this issue and the relevant actors involved, a number of models are surveyed, and the similarities and points of distinction are highlighted. A final section concludes.

2 Three approaches to reputation

In this section, before considering specific models of reputations of firms distinct from individuals, I briefly review different notions of reputation that have been employed in formal models. Typically these have been applied to a firm as an unitary entity or to an individual and have been developed in a number of different applications (including predatory pricing, central banking, reputation for quality etc.)

In particular, more recent literature, following Fudenberg and Tirole (1991) restricts the term reputation for consideration of the first notion considered below, that is where an agent's reputation is defined as the belief of others about the type of the agent, which is drawn from some distribution. I briefly review this notion and then go on to consider two other notions of reputation. The first of these two views reputation as a pure commitment device and is strongly related to the type-based notion which to some extent predates it. Both this approach and the belief-based approach highlight reputation as a valuable asset in which one can invest and which can be dissipated (often in an extreme and discontinuous way).

Finally, I consider reputation as a coordinating device; later in the discussion on firm reputation, I relate this notion both to the coordination within the firm and among those externally involved in the firm. Note that in a broad sense in the first two notions as well, reputation acts to coordinate actions of different agents (for example in the repeated game notion, an agent with no reputation to maintain does not take the good action as her lack of reputational capital affects the behaviour of other agents with whom she interacts; in the type based notion this kind of coordinated action between the different agents affects

only strategic agents rather than commitment types). More generally, any equilibrium chosen when there are multiple equilibria relies implicitly on some kind of coordination—reputation is a natural and explicit device to allow this.

2.1 Reputation as belief

This view of reputation begins by supposing that there is incomplete information about a player's type with different types expected to play in different ways. In many models (including Kreps and Wilson (1982), Milgrom and Roberts (1982), Fudenberg and Levine (1992) and Ely, Fudenberg and Levine (2002)) it is assumed that at least one type will behave in some deterministic fashion (these are termed “commitment” types in Fudenberg and Levine (1989)) and in these models only one type behaves strategically. In all such “reputation as belief” models, a player's reputation is summarized by other players' (and possibly her own) current beliefs about her type. These beliefs in turn (and depending on the equilibrium strategies) lead other players to expect particular actions (or distributions over a set of actions), in equilibrium these expectations are rational or accurate predictions of behaviour.

Note that in these models, for reputation to play a role in affecting behaviour, it must be that there is some uncertainty, or equivalently that the reputation is at risk. If the player's type is known precisely then her action will have no effect on other's beliefs about her and so will not affect her behaviour. In the Kreps, Wilson, Milgrom and Roberts models such uncertainty can be maintained indefinitely as when the strategic type behaves identically to a strategic type, there is no further learning on the part of other players and so uncertainty is perpetually maintained. In the absence of a commitment type that the strategic type would like to mimic, other mechanisms are necessary to maintain the uncertainty required for reputational incentives, as discussed in particular in Chapter 3 of Bar-Isaac (2004). Even with such a commitment type, as Cripps et al. (2004) show, reputational incentives cannot be sustained indefinitely if actions are only imperfectly observed.

2.2 Reputation as a pure commitment device

The notion of reputation purely as a form of commitment is based on a framework where in effect the type of the agent is known. The approach focuses on self-sustaining equilibrium strategies in infinite horizon models which ensure some kind of good behaviour (“cooperation” in the prisoner's dilemma, for example) with the threat of some kind of punishment

should the agent ever defect. This is the usual trigger strategy approach, where so long as everyone has been acting as they should, then everyone cooperates but if ever this trust is breached (or the good reputation is lost) there is punishment. Such punishment need not be permanent – as highlighted in particular in the work on repeated games with imperfect observation of actions of Green and Porter (1984), and Abreu, Pearce and Stachetti (1990). However, a wide range of equilibria is typically admitted and the results rely strongly on an assumption of an infinite horizon in these models. An example of this approach is Klein and Leffler (1981) in which a firm can maintain high quality and high prices with the threat that should it ever deliver low quality products, it would no longer be able to charge high prices.

This approach has been criticized on the grounds that the initial reputation springs from nowhere, though this criticism has been to some extent addressed. In Klein and Leffler (1981), for example, the seller must spend on advertising, marble-clad offices or some other irrecoverable sunk cost in order to establish an initial reputation.

Another criticism of this approach has been that there is little scope for interesting reputational dynamics, at least in the perfect observability case. The common perception of reputation as an asset, which can be slowly built up, dissipated and then rebuilt, is hard to accommodate in this approach to reputation, whereas the type-based approach can allow for this sort of behaviour.¹ Moreover, the type-based approach can also be seen as advantageous inasmuch as it allows for reputation to affect behaviour even in a finite horizon model, it might allow for equilibrium selection or more robust equilibrium, and perhaps most importantly, the type based approach seems to ring true in describing people’s understanding of reputation—that it reflects a belief about the type of person that an agent is.

In many cases, however, the belief-based approach to reputation introduces reputation effects in allowing strategic types at given reputation levels to commit to particular actions and in a number of models, the reputation as a pure commitment approach and reputation as belief approach can lead to similar outcomes.² For example in the repeated prisoner’s dilemma one can allow for the possibility of a type that always cooperates, and this might allow a strategic types also to commit to cooperation in an attempt to maintain a reputation as this cooperating type; a similar outcome can arise in the repeated game with no type

¹See for example Diamond (1989) and Benabou and Laroque (1992) who can allow for such reputational dynamics in a type-based model of reputation.

²See, in particular, Fudenberg and Levine (1989).

heterogeneity where players play the “grim trigger” strategies “cooperate until an opponent defects and then defect thereafter”.

2.3 Reputation as a coordination device

The third notion of reputation views reputation as a coordination device. As a simple example, consider driving conventions. Most people know that in England, people drive on the left and in the US on the right; either convention would work equally well, but it is important that in each country people drive on the same side, even though this may differ by country. One can think of the US as having a reputation for people driving on the right (albeit one that is maintained to some extent by legal requirements) and that this reputation acts to coordinate people’s actions. Thus reputation can establish a “focal point” for coordinated action (Schelling (1960)). Boot and Milbourn (2002) for example, consider the role of credit ratings in coordinating behaviour and expectations and so in determining a particular equilibrium in an environment where without the use of these ratings, many equilibria are possible.

This kind of reputation underlies some discussions of corporate culture, in particular in parts of Kreps (1990).³ Kreps discusses corporate culture as some sort of principle or rule that has wide applicability and is simple enough to be interpreted by all concerned together with the means by which this principle is communicated. In many instances, a number of principles may be valid, but that one is chosen and clearly communicated, understood and anticipated is crucial.⁴ Defining firm boundaries and activity conducted with and within a firm which has a particular corporate culture (or reputation for upholding a particular principle) can therefore be of considerable value.

A related literature, which is concerned with the role of reputation in coordinating the behaviour of a firm’s customers rather than focusing on behaviour within the firm, considers the coordinating role of advertising. In these models one could consider advertising as establishing a reputation that the product will be popular and thus these models address this aspect of reputation. In particular, Bagwell and Ramey (1994) suppose that the price that a seller charges decreases with the number of customers that the seller expects and Pastine and Pastine (1999) suppose a consumer’s valuation for a product is directly increasing in proportion to the number of others that purchase; in both these models

³See Hermalin (2001) for a survey on corporate culture.

⁴For example consider a game of matching pennies—coordination on an equilibrium is more important than the particular equilibrium chosen.

coordination takes place through observation of advertising levels. Finally, in Clark and Horstmann (2001) coordination takes place through consumer beliefs about advertising levels.

Advertising campaigns have frequently appealed to this notion of reputation; for example IBM ran a campaign with a famous slogan “no one ever got fired for buying IBM” or the British soap opera *Eastenders* ran a campaign with the slogan “Eastenders: Everyone is talking about it”. The IBM campaign, rather than appealing to an intrinsic quality of the computers appeals to a social quality—that others rate IBM computers as good; more directly in the Eastenders campaign it is clear that the appeal is to a social externality.⁵

3 Individual and firm reputations

In this section I ask when and why it may be important to distinguish between individual and firm reputations and highlight that in considering reputation, it is important to step back and ask what is the reputation for and who are the parties interested in this reputation.

In essence, distinguishing between the reputation of a firm and an individual member of that firm, is an exercise in opening the “black box” of the firm and in developing an understanding of firm and individual career dynamics. If the constituent members of a firm never change and have no opportunity of leaving and continue operating in an identical way throughout time, then there is little value in distinguishing between the reputation of individuals within the firm and the contribution of the firm itself (I discuss below what this might mean).

However, since employees may choose to leave and work in other firms or on their own or can threaten to do so as a means of raising their wage, or other new employees may join the firm, developing individual reputations may be of considerable interest and disentangling the reputation of the firm might be valuable. Reputational considerations, in addition to determining wages, can also be useful in terms of sorting—that is ensuring that the appropriate agent is assigned to the most productive job, or rather the job in which they are most valuable.⁶ In addition to determining wages and affecting job assignments, and

⁵See Brandenburger and Polak (1996) for a related idea in which CEOs behave even against their information to satisfy expectations of investors.

⁶See Felli and Harris (1996) in which the value of a worker in a job is determined by the best estimate of their current value in that job and how much information would be gained about their productivity in this job and in an alternative. See also Anderson and Smith (2002) where learning considerations can over-ride considerations of productivity in a decentralized market.

through its effect on these, reputational concern can also affect incentives, task assignment and the internal design of organizations.

3.1 Reputation for what?

Firms interact with numerous different agents and in many different ways. Audiences include customers, current employees, potential employees, competitors (in the product market and in the labour market), and investors and large firms may also interact with consumer groups and government. For each of these groups, the firm's reputation may have a different meaning; for example, customers are likely to be primarily interested in the quality of the service provided, and current and future employee may be interested in the firm's informal compensation bonus and promotion schemes, in the training provided and in the firm's reputation as a good trainer or for its ability to identify good workers (which would affect the employee's future career prospects). To some extent, it may be possible to write explicit contracts to deal with some of these features (for example for some experience goods the firm might be able to provide a warranty) but in many cases no formal contract can be written and reputation is critical.

In highlighting that there are many different attributes of the firm for which it may develop a reputation and that different interested parties have different concerns, we draw attention to the observation that much informal discussion on developing a good reputation is somewhat disingenuous inasmuch as it does not discuss for what and with whom. Moreover, it is far from clear that developing a good reputation with one party entails a good reputation among other interested parties. For example, having a reputation as a generous employer might help to attract and retain good staff, but may lead customers to believe that the goods or services are over-priced. Similarly, a firm might benefit from customers believing that the firm's employees are excellent individuals but if competitors also share these beliefs then the firm might be at risk that its staff are poached.⁷ Nevertheless, Fomburn (1996, p.395/6) has argued that it makes sense to speak of a corporate reputation as a single notion, though the firm may have numerous attributes. Fomburn argues that one should consider a company's overall reputational profile though this should be built up by identifying a company's key constituent groups, sampling these and aggregating to obtain a reputational rating on "relevant dimensions".

⁷This concern, over giving too much information to rival employers has been explored; for example in Greenwald (1986) and Waldman (1984).

Chapter 4 of Bar-Isaac (2004), for example, highlights that even thinking about reputational concerns in terms of customers' beliefs regarding the quality of service that they will receive can have exactly opposite comparative statics depending on whether the agent's concern is to acquire a reputation for excellence or to avoid one for ineptitude.

In another recent paper, Koszegi and Li (2002) show that when agents differ not only with regard to their ability but also with respect to their ambition, then since a good outcome may reflect high ambition rather than high talent, a good outcome may reflect ambition and so be interpreted as bad news about the agent's ability. This richer view of an agent's motivation has interesting consequences, for example a principal might want to observe measures of the agent's effort (for example hours worked) early but not late in the agent's career.

Below and following a large literature in economics, I focus on reputation as customers' belief that they will receive high quality service. This will involve primarily the ability of individual employees of the firm, but also the firm's ability to ensure effort on the part of its workers, its ability to introduce good new employees, and its ability to coordinate the behaviour of its employees and possibly of other actors. The last of these categories—that is the role of reputation in coordinating the behaviour of employees—differs significantly from the others considered and so beyond the discussion of reputation as coordination above we do not return to address it specifically. The other categories apply when each individual's production is independent of other agent's actions, at least in the static sense that a given individual action leads to a given output, independently of whatever anyone else might be doing or whoever else might be in the firm. For the coordinating role of reputation, this is clearly not the case.⁸

Thus my focus is on models of firm reputation which view firm reputation as giving some information about the individuals within the firm, this information may be about:

- productive behaviour of individuals within the firm;
- productive ability of new employees; and,
- productive ability and behaviour of individuals within the firm.

⁸Note that in addition to uncertainty about the ability of employees, there may be uncertainty about a firm's assets, that is a firm's reputation may also depend on non-human capital. To some extent, we allow for this in discussing corporate culture which is an intangible non-human asset, but abstract from allowing for other physical or intangible assets, or equivalently we suppose that these are fixed exogenously and there is no uncertainty concerning them.

To some extent, these distinctions are arbitrary. For example, if firm reputation is informative about the productive ability of new agents, then in a dynamic model it would also give information on the productive ability of individuals within the firm. However, it is hoped that these distinctions might be useful in highlighting the multi-faceted role of reputation and draw attention to particular aspects (such as the implications for the hiring process).

Each of these categories is addressed separately below; though the last two are at the heart of this note.

4 Firm reputation and behaviour

This class of models builds on the notion of reputation described in Section 2.2. Before, considering the role of individuals within a firm, first we briefly review this notion applied to firms behaviour with no separate identification of individuals.

In a seminal paper, Klein and Leffler (1981) highlighted the role that a repeat-purchase mechanism can play in ensuring high-quality supply. A necessary condition for such a mechanism to play a role is that information on a firm's current behaviour is at least partially observed by consumers before they make their decisions to buy in the next period; in effect, this condition is equivalent to the requirement that behaviour should be able to change reputation otherwise it is intuitive that reputation would impose little discipline on behaviour. An important contribution of Klein and Leffler (1981) however, is that in itself this is observation of previous behaviour is not sufficient to ensure that a firm will produce high rather than low quality (or in some other way will behave well even though it is more costly in the short run than behaving badly). Klein and Leffler (1981) argue that:

Cheating will be prevented and high quality products will be supplied only if firms are earning a continual stream of rental income that will be lost if low quality output is deceptively produced

Equivalently, high reputation firms must earn positive profits, since sellers can always increase profits in the short-run by reducing the quality of their products. Thus it must be the case that behaving well, for example by producing high quality, should earn the firm profits since otherwise it would be dominated by a fly-by-night or hit-and-run strategy of

quality reduction.⁹ In this context two related questions that arise are how this flow of profits can be reconciled with free entry and where the initial high reputation comes from. Klein and Leffler (1981) suggest that a firm will only obtain such a reputation to begin with following an appropriate level of non-recoverable expenditure, such as advertising—this up-front investment which buys reputation and the revenue flow that it implies therefore works as a bond which is lost if the firm should “cheat”. Shapiro (1983), in a model where consumers believe that the firm will produce today at the quality it produced in the last period, describes how initially customers would believe a firm produces low quality, so that producing high quality (and selling at the low quality price) for an initial period can dissipate profits and act as an investment in reputation.

Thus in both models, early investment and continual good behaviour lead to a stream of returns on reputational capital, though “cheating” might be more attractive in the short-term. In Klein and Leffler (1981) the early investment in reputation is through some irrecoverable expenditure, in Shapiro (1983) this kind of irrecoverable expenditure is more directly observed and indeed the focus of the paper—it is a loss incurred on early sales in an early phase of building up a reputation. These models require that the firm be infinitely-lived—a finitely-lived firm would “cheat” in the final period, and so there would be no sense in maintaining reputation by behaving well in the penultimate period, and similarly such incentives unwind for earlier periods.

The acquisition of a firm’s name can constitute a kind of irrecoverable investment as suggested by Kreps (1990).¹⁰ In particular this implies the construct of a firm name can effectively act as a potentially infinitely-lived object and so even though individual agents might be finitely-lived they have the incentive to maintain the firm name, which they can sell to younger agents. Younger agents in turn must purchase such costly firm names as a bond to ensure that will behave well. Thus this construct both creates a potentially infinitely-lived object (the firm-name) for which the repeat-purchase mechanism can ensure a reputational concern for good behaviour and through its costly transfer, it allows finitely-lived agents to maintain reputations (it is valuable for an agent to do so since at retirement

⁹Essentially since a firm can always withdraw from the industry and earn zero profits, this sets a lower bound for any effective punishment that customers might impose on a firm; such a punishment can only be imposed after any “cheating” has been detected and so a “cheating” strategy always earns positive profits if the firm is expected to behave honestly in the current period. Thus to encourage honest behaviour, such behaviour must be rewarded with positive returns.

¹⁰The investment in the firm name is recoverable, but only in the case that the holder of the name has behaved well, that is it acts as a bond.

she can sell the name that she has maintained).

Moreover, in contrast to the Klein and Leffler (1981) and Shapiro (1983) models which do not distinguish between a firm and an individual, Kreps (1990) does make this distinction, in a model where the firm can be thought of as a label passed from one individual to another; and individuals need such a label in order to credibly promise good behaviour. In a related model, Cremer (1986) also considers over-lapping generations in a model with no direct monetary transfers between members of a firm but where a junior in a firm behaves well as otherwise the firm's reputation would be lost and a new junior would cheat when she is a senior.

5 Firm reputation and hiring new employees

In this section, I consider the interaction of firm reputation and the recruitment of new employees. First, as outlined above, inasmuch as a firm affects the behaviour of those within it, this clearly extends to the behaviour of new employees; however, in this section, we focus on reputational concerns and hiring decisions. Essentially, in this section, I ask how reputational concerns affect who is hired.¹¹

First note, that in asking the question of who gets hired, we already impose an assumption that there are different kinds of agents who might be hired—that is I implicitly type heterogeneity among the pool of potential employees. Moreover in most of the models discussed below, it is assumed that either employers have better information about potential employees than customers or otherwise that they can acquire it.¹² I review models of the following form:

- firm reputation as commitment to select only good employees (certainty about firm, uncertainty about employee);
- hiring as a costly signal (uncertainty about firm, no uncertainty about employee);

¹¹In particular I ignore complementarities in production itself.

¹²It is possible to construct a model where hiring can still affect the reputation of a firm when there is no type heterogeneity among potential employees or customers have identical information to the firm, in which hiring in effect acts as a costly signal about the firm or existing employees rather than about new employees. For example, hiring many employees might serve to demonstrate that a firm is confident in its ability to continually win new business, this can lead a customer to try it out—I discuss a similar kind of effect below in a model of type heterogeneity.

- uncertainty about both firm and employee—umbrella branding, scapegoat and other notions; and,
- hiring to introduce uncertainty.

5.1 Firm reputation as commitment to select only good employees (certainty about firm, uncertainty about employee)

As discussed above, in Section 3.1, there are different aspects for which a firm may develop a reputation; in particular, even if customers know perfectly the ability of those currently employed by the firm, a firm may seek to develop a reputation for only hiring good employees. Although as far as I know this idea has not been much explored in the context of labour, an analogous idea has been discussed in the context of extending a brand name to new products in Choi (1998).

In order to make this idea clear, consider the following game.

There is a firm or employer, a steady stream of potential employees and a continuum of myopic customers. At each stage, a single employee comes to the employer, the employer may learn the quality of this employee, which may be either low or high, at a cost i (the cost of interviewing).¹³ The employer then decides whether or not to make the potential employee an offer, the employee decides whether or not to accept (if not the employee takes up some fixed outside option $R > 0$). If this employee is hired, customers Bertrand compete for the service; only after the service is bought is its quality realized and we suppose that low quality is worth 0 and high quality worth 1. The employee then retires or moves on.¹⁴ Such a stage, as represented in the timeline below, is then repeated.¹⁵ Suppose that *ex-ante*, there is a probability λ that a potential employee will be good and that there is a discount rate between periods of δ .

¹³One might ask could customers not directly interview. It may be that the firm has unique access to an interview technology (so for example those with experience are best positioned to judge the potential of employees). Alternatively, one might consider the firm as a delegated monitor, a single employee might work for hundreds of customers, for whom individually it is not worth assessing the quality of this employee.

¹⁴This assumption is made so that the firm does not grow infinitely and since once the employee's quality is known the profit that the firm may be able to make from this employee may be more limited.

¹⁵Note that there is some tension in this formulation in supposing that employees stay only one period and yet the firm is infinitely lived; one can think of the employer as holding the firm name, as in the Kreps (1990) model, say. Of course, it also need not be the case that the employee literally only works once, a period may be a length of time that lasts for a while, and it need not be that only one employee is hired at a time.

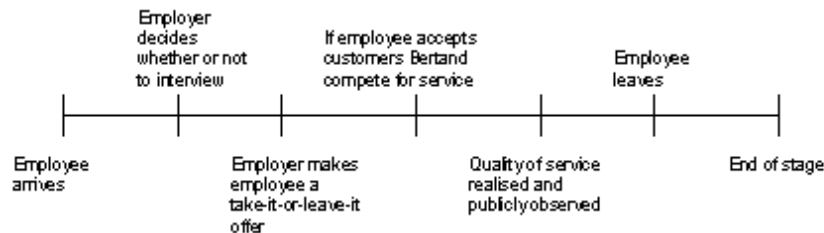


Figure 1: Timeline for a stage

Standard techniques can be employed to show that so long as $\frac{\lambda(1-R)-i}{1-\delta} \geq (1-R)$, then the following is an equilibrium:

The firm begins in Regime I and stay there, unless customers observe low quality service in which case switch to Regime II.

Regime I Employer interviews, if the potential employee is good, then employer offers employment at wage R . The service is bought at a price 1.

Regime II Employer does not interview, makes no offer of employment (and if she did then the service would be sold for λ).

Thus in this equilibrium the firm maintains a reputation for hiring only good employees, and should it ever lose this reputation (which it may be tempted into as this would save the cost of interviewing or allow the firm not to have to wait in order to hire) then it loses the option value of future profitable hires. Essentially, then in this model, the firm acts as an intermediary between customers and the labour market, maintaining a reputation for selecting only good employees.¹⁶

A similar result can be maintained even with no dynamic considerations. In a model of horizontal differentiation, where customers have heterogeneous tastes a firm with better information on workers might have a strict incentive to hire a particular type of worker even within a period. Thus the firm confers a meaningful label on the employees that it admits to the firm. As an example, consider a situation where there are economies of scale in advertising and customers have horizontally-differentiated preferences, say that some customers prefer paintings by left-handed artists and others prefer those by right-handed artists. Then there is a clear benefit for agglomeration, that is for groups to sort themselves separately into organizations of left- and right-handed artists.

¹⁶For a thorough discussion of different aspects of the firm acting as an intermediary between customers and suppliers see Spulber (1999).

5.2 Hiring as a costly signal (uncertainty about firm, no uncertainty about employee)

In the discussion above, we have considered a case where there is no uncertainty about the ability of the firm, but there is *ex-ante* uncertainty on the ability of employees. Hiring can also play a role in the opposite case, that is where there is uncertainty about the firm but not about the workers. The costly hiring of a well-known employee can serve as a costly signal as to the type of the firm, or other workers. For example, Hollywood movie-makers clearly take into account in choosing the cast that potential customers will be influenced by this choice in deciding whether or not to see the movie;¹⁷ similarly academic departments and professional services might display an intention that they are changing strategy with a high profile hire.

This kind of signalling is also known as money-burning.¹⁸ A signal is meaningful inasmuch as it has more value for one type than another, this different value may arise either from different costs or different benefits of the signal (or both). In a money-burning equilibrium, the cost of hiring a star would be identical to either a “good” or “bad” firm, but the benefits differ. Typically this is because customers buy repeatedly and though the signal might cause customers to buy from the firm once (or try the services of a worker within the firm other than the star), they will only buy again if the firm performed well.¹⁹ This in turn can contribute to the wages of those with sufficiently high profiles, and thus contribute to superstars earning stellar wages, which reflect not only a productive ability but also a reputational value.

5.3 Uncertainty about both firm and employee

I extend the discussion and now allow for the possibility that the abilities of both the firm and potential employees are uncertain. In this case, a decision to hire (particularly when this is costly, say because the employee needs some basic training in the way that the firm operates) can act as a signal on both. This notion has been explored, though again rather than in relation to hiring, in the context of a firm which must decide whether or not to

¹⁷Of course, there are a few effects involved, some viewers may be influenced just because they like looking at Arnold Schwarzenegger, say, for a couple of hours; others might be influenced because they have expectations of the kind of movies in which he is likely to star.

¹⁸The notion of costly expenditure as a signal is well-articulated in Milgrom and Roberts (1986) where the expenditure is on advertising rather than hiring a superstar.

¹⁹In the movie example, knowing the star might lead a movie-goer to look at the reviews, or though it may cause a movie-goer to watch the movie, its quality might then lead her to recommend it or warn others.

brand a new product under a new brand name or the existing name. This kind of umbrella branding has been explored, for example by Cabral (2000) and Wernerfelt (1988), who concisely summarizes this mechanism as follows:

When a firm brands a new product, it is in effect doing two things: it is claiming that the old and new products are both of good quality and it is inviting consumers to pool their experience with the two products to infer the quality of both.

This notion thus suggests that good firms are more likely to hire, to keep showing that they are good and are likely to hire good employees. Other authors, however, have suggested that good seniors may hire bad juniors. In particular, Segendorff (2000) and Glazer and Segendorff (2001) suggest that a good senior may choose to work with a junior who is perceived as bad—the rationale is that the incompetent co-worker can credibly be blamed if things go wrong.²⁰ Such a model relies on the feature that outsiders (whether principal or customer) cannot attribute the contributions of the two agents separately. The model also relies on a non-linearity in rewards to reputation which leads to risk aversion and so an important role for this insurance effect.

5.4 Hiring to introduce uncertainty

As discussed in Section 2.1, in order for reputational incentives to affect an individual's behaviour, her reputation must be at risk. When an agent has an established reputation therefore, such reputational concerns are muted and so with no other commitment device, an agent would exert no effort when this effort is costly, even though such effort is efficient. In Chapter 3 of Bar-Isaac (2004), I argue that hiring and working with a young agent of uncertain ability can introduce this uncertainty and provide reputational concerns to give incentives to the senior (though the reputational concern is for her employee, rather than for herself). This mechanism applies when the established and junior agents can work together in a non-observable production process, there is sufficient uncertainty about the junior's ability and the senior agent is able to gain from the junior's reputation in the future.

²⁰Segendorff also suggests other motives for competent leaders to choose incompetent workers: to decrease the number of potential rivals and to emphasize their own ability. Glazer (2002) suggests that a leader may not want to work with an able co-worker for fear of theft of assets.

6 Firm reputation as information on individual ability and behaviour

Although the section above highlighted the role of firm reputation on new employees and indeed on the role of hiring on reputation, in some cases customers may be unaware, or at least partially unaware of an individual worker's history and in particular how long the individual has been associated with the firm. Nevertheless, though customers may have limited information about the individual, they may have better information on the firm or at any rate the information about the firm may confer additional information on the individual. Tadelis (1999) for example distinguishes between the entity and the identity, that is between what constitutes the firm at present and its perception which may depend to a greater extent on the past. This distinction, and underlying it the different information that customers have on the firm and its current owner, and the central observation in reputation models that an individual's behaviour is based not only on her type but also on how she is perceived lead to a number of observations which have been highlighted in a number of papers discussed below.

First, an individual's behaviour is influenced by the reputation of the firm to which they belong—since this might change the way that the individual is perceived and so how her behaviour is understood and used to form her own reputation. Second, a firm's reputation is in itself influenced by its past members and their behaviour and so, in particular, the behaviour of current members might depend on the behaviour of past members. Furthermore when the history of a firm's performance is observed better than individual performance and, in particular, when changes in ownership are unobserved, this can lead to a market for names; and, in addition, such changes in ownership can sustain sufficient uncertainty to maintain reputational incentives.

We enlarge on these points below, discussing models according to the following classification:

- the firm consists of a single individual
 - changes to the firm's composition are fully exogenous
 - changes to the firm's composition are partially endogenous
- the firm is “large”

- changes to firm composition are fully exogenous
- changes to firm composition are partially endogenous

6.1 The firm consists of an individual (exogenous changes in composition)

The simplest model of this sort views the firm as a label or location held by an individual; customers can observe the history of that location (that is whether good or bad products were produced there in the past) but not whether the individual at the location changed. In each period there is a probability that the location holder changes and the type of the new holder is allocated according to some exogenously probability distribution.

In this model, discussed by Phelan (2001) and considered by Holmstrom (1999), the possibility that the type of the location-holder has changed in each period ensures that customers can never become certain about the type of the current holder. Moreover, since there is a probability that the current holder will stay to the next period, her action can influence her reputation in the next period and this reputational concern will affect her behaviour as she will benefit (or suffer) by behaving well (or badly).

6.2 The firm consists of an individual (partially endogenous changes in composition)

A more complicated approach has supposed that the probability with which a location holder is replaced is fixed (or at least constrained as in Assumption (A4) in Tadelis (2002)) but that rather than the new location holder being randomly assigned as above, this assignment results as the outcome of a market for names. Since name transfers (as the changes in the holder of the location) are not observed by customers and cannot always occur (that is there is always some probability that the holder of a name today is the same individual that held it yesterday), good reputations are valuable and can be traded. Moreover, an individual is motivated to build up a reputation not only in case she still holds the reputation tomorrow (as discussed above) but also since even if she does not hold the reputation tomorrow, she may be able to sell the reputation.

Tadelis (1999) develops an adverse selection model (so that there is no behaviour to be influenced) to focus on the market for names and study the economic forces that cause names to be valuable, tradeable assets. The paper shows that an active market for names with either finite or infinite horizons will exist but there can be no equilibrium exists

in which only good types buy good names. Incentive effects together with a market for names are considered in both Tadelis (2002), and Mailath and Samuelson (2001), who both highlight that the market for names cannot be fully separating (that is it can never be the case that only good firms buy good names).

6.3 Large firm with exogenous composition

Tirole (1996) spells out a theory of individual and collective reputation, where group composition changes exogenously and in a way that is not observed by customers (that is old agents are replaced with new agents and such replacements are not observed). The building blocks of this model, which highlight many of the themes discussed in this note, are clearly described and are repeated here:

(a) *A group's reputation is only as good as that of its members.* Each member is characterized by individual traits such as talent, diligence or honesty. Past individual behaviour conveys information about these traits and generates individual reputations.

(b) By contrast with group belonging, *individual past behaviour is imperfectly observed.* If past individual behaviour was fully unobserved, members of the group would have no incentive to sustain their own reputations and therefore the group would always be expected to behave badly. Conversely, the collective reputation would play no role if individual behaviours were perfectly observed. Imperfect observability of individual behavior thus underlies the phenomenon of collective reputation.

(c) *The past behaviour of the member's group conditions the group's current behaviour and therefore can be used to predict the member's individual behaviour.* Each member's welfare and incentives are thus affected by the group's reputation.

(d) If we further assume that the age in the group, or the frequency of interactions with the group, or the number of past opportunities for cheating are imperfectly observed, cohorts in a self-generating group are partly pooled and therefore, *the behaviour of new members of a group depends on the past behaviour of their elders.*

In contrast to the models of the firm as an individual, in this model the firm is treated as a large group, so that a single individual's behaviour cannot affect the reputation of the

group as a whole. Thus, although an individual is influenced by the collective reputation as it may change the way that her own behaviour is interpreted and her own reputation revised, she does not consider the impact of her behaviour on the collective reputation (or ignores it since it is negligible). The focus, as highlighted by the extensive quotation above is on how partial observability and behaviour leads collective reputation (even when arising from previous generations) to affect an individual's behaviour.

6.4 Large firms with endogenous composition

The approach discussed in the paragraph above which considers how the past behaviour of one's peers, by shaping the way that individual achievements are interpreted, could influence present reputational incentives, is further extended in Levin (2001). This paper considers decisions about group membership—that is an individual (assumed to know her own type) can decide which group to join. Groups are assumed not be able to observe the types of potential members (or at least not to discriminate) but different groups can charge a different membership fee (in the labour context this is equivalent to offering a different starting wage, with later wages determined by individual reputations). In particular, Levin (2001) shows that there are equilibria where groups with different characteristics and behaviour coexist, though the model relies on coarse reputations for individuals.

7 Conclusions

This note outlined three broad modelling approaches to reputation—a type-based view, a view based on commitment in an infinitely repeated game, and an approach based on coordinating action between several agents. Drawing largely on the first such view, the heart of this note is a categorization of approaches to the interaction between the reputation of a firm and its employees. A somewhat artificial distinction was made between consideration of a hiring decision and on information about existing employees and a wide range of considerations were introduced.

In the discussion above, there is no productive advantage or loss *per se* in hiring a particular individual, for example (though of course in changing expectations, such a decision may affect beliefs). In general however, firm composition or size will have an important effect on productive efficiency, and this effect may counteract or overwhelm opposition to

reputational concerns.²¹

It is perhaps also worth noting that models of reputation and the interaction between individual and firm reputation are to some extent bound to be complicated. These models rely on at least three different kinds of entity (a firm or perhaps employer, an individual or employee who may be associated with the firm and a customer or some other agent who cares about these reputation) and reputation is clearly a dynamic concept. The models described above are necessarily simplifications and abstractions designed to highlight specific mechanisms; however as our intuition for such mechanisms improves, it might be interesting and valuable to consider other aspects, such as the role of risk aversion and precision of beliefs as well as the levels, and understand the interaction between such mechanisms and other factors, such as heterogeneity in prior beliefs²² or the effects of industrial structure and competition. Further, inasmuch as dynamic problems rely on complex inference problems, the effect of costs in making calculations or other forms of bounded rationality might have a large effect on the conclusions drawn from formal models. Another aspect that has not been addressed in this discussion is how reputation spreads—typically I have assumed that all customers have the same information. In some applications it may be reasonable to suppose that current customers have better information and that the current customer base has a role to play.²³ No doubt numerous other factors can be brought to bear in addressing some of the issues raised above and there is much still to be learned.

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²¹Tension between reputational (or commitment) concerns and static productive efficiency and its implications for firm composition have been highlighted, for example, in Levin and Tadelis (2002) and Anderson and Smith (2002).

²²See for example Van den Steen (2001) on the role of heterogenous priors on corporate culture.

²³See for example Ottaviani (1999) and Fishman and Rob (2002) on related questions.

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