The Strategic Implications of Organizational Forgetting: Impacts on Vertical Integration

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Abstract
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1. Introduction

Caffe Sicilia is a historical culinary landmark in Southern Italy, known for its pastries. Founded in 1892 and based in the Sicilian city of Noto, it is currently being run by Corrado Assenza, its fourth-generation owner and the person who raised the establishment to international recognition due to his mastery of local ingredients in making traditional Sicilian pastries, as well as in pushing the frontier of pastry-making with his bold innovations. He has always been known for his take on traditional Sicilian sweets such as cannoli, gelati and especially granita, which is made from sugar and ice and blended with fruit or other natural ingredients – often almonds. After a period of trying to innovate with its recipes, Caffe Sicilia entered into a crisis, and Corrado needed to make a strategic decision on how to get his business back on its feet. He decided to go back to his origins and revitalize his almond granita. However, he noticed that his locally sourced Romana almond, a crucial ingredient, was at risk of severe depletion from the Noto land. The problem could be traced
to the traders, who decided the almond was not worth investing money in. As a result, the farmers abandoned the land. So Corrado put together a plan to save the almond: “We would cut out the traders, so the farmers could sell the almond directly to us. We started to spread it among the farmers. I had to convince them to fight for the almond because it’s a cultural heritage. Because if it disappears, it will never come back. It was a long and slow process, but eventually they wanted to work with us. We brought [the almond] to the taste expo in Milan. From that moment on, the world knew of the existence of our almond. Then, I went back to the laboratory to work on a new recipe to highlight the almond…”.

What led Corrado to take such drastic actions? What trade-offs he had in his mind as he took them? This short anecdote, and the questions it brings up, serves to illustrate the issue that this paper will explore: how businesses strategize ex ante around the issue of organizational forgetting – in other words, how does the ex ante perspective of organizational forgetting, and the firm’s eventual desire to prevent it, affect its corporate strategy decisions. When should managers give up on knowledge – which can be embodied in technology, production inputs, human capital or resources in general – that have become obsolete or with an increased (opportunity) cost to keep them in the short term, even when they have invested a significant amount of time and resources to accumulate them and when this knowledge might become valuable again in the future? Conversely, when should managers invest in changes to their corporate strategy that maintain knowledge in the short run, in the hopes that this effort to preserve hard-earned knowledge can be (re)deployed profitably in the future? In the case of Caffe Sicilia, even though the market environment for the Romana almond at the time was not conducive to maintaining the firm’s activities geared around it, Corrado felt that the knowledge that had been developed around the almond was too valuable to be lost – so he invested time and resources to preserve it.
It is important to note that here we allude to forgetting not in its more conventional meaning, expressing unintentional loss of knowledge, but rather an intentional, albeit ultimately forced by the circumstances, occurrence (de Holan and Phillips 2004a). In this sense, we refer to the decision to strategically forget. Furthermore, we emphasize changes in corporate strategy as a way to preserve knowledge to differentiate our arguments from changes in firm routines related to the development of an organizational memory. In fact, the arguments we present on how corporate strategy is affected by the firm’s desire to prevent organizational forgetting take as a starting point the premise that this prevention cannot happen through the use of organizational memory.

The specific instance of corporate strategy that is affected by organizational forgetting considerations that is analyzed in this paper is vertical integration decisions. We argue that viewing vertical boundaries decisions through the prism of organizational forgetting has explanatory power beyond that which can be provided by traditional explanations of vertical integration – in particular, those based on transaction cost economics. This new prism allows us to arrive at novel contingencies that affect vertical integration, such as the impossibility (or the prohibitive costs) of recreating knowledge that has been developed either by a supplier on its own, or by a supplier in conjunction with the buyer. Importantly, this argument does not require the assumptions of opportunism and asset specificity prevalent in transaction cost economics.

What makes decisions on divestments in knowledge different from divestment decisions in assets in general – why do we need a specific theory for it? A fundamental difference is non-tradability – if the asset can be easily acquired in the market in the future, then there are no problems in disposing of it now. However, Dierickx and Cool (1989) argue that markets for some assets simply do not exist – you cannot buy trust, for instance – and these assets are often highly firm-specific. Therefore, firms have to make strategic investments to accumulate these assets internally over time.
and these arguments are particularly applicable for knowledge assets. Teece (1982) makes a similar argument but focusing on the case of knowledge, claiming that “markets do not work well as the institutional mode for trading knowhow”, since an important component of organizational knowledge is tacit. Therefore, the transfer of tacit knowledge is likely to be difficult and costly.

This paper is organized as follows: in section 2, we go over the concept of organizational forgetting and review the literature; in section 3, we analyze some determinants of the decision of organizational forgetting; in section 4, we argue that this decision has important implications for vertical integration and preliminarily illustrate this argument with a case study; in section 5, we conclude.

2. Literature Review

If we take knowledge as the building block of a firm (Grant 1996), it follows that the study of business strategy should carefully analyze the determinants and trade-offs involved in strategic decisions that involve knowledge, such as organizational learning (Levitt and March 1988) and strategic alliances (Mowery, Oxley and Silverman 1996). More generally, the literature on knowledge and strategy refers to three knowledge management outcomes that encapsulate the research in this area (Argote, McEvily and Reagans 2003; Argote 2012): creation, retention, and transfer of knowledge. This paper answers previous calls for research on the role of forgetting in organizations’ knowledge management efforts (Nystrom and Starbuck 1984; Bettis and Prahalad 1995; de Holan and Phillips 2004b) by proposing that strategic forgetting is an important and overlooked aspect of the complete knowledge cycle, and takes an organization-level view to explore both how businesses strategize around this issue and how it impacts other strategic choices.
Organizational forgetting can be defined as the loss, either involuntary or intentional, of organizational knowledge (de Holan and Phillips 2011). As mentioned above, our project will be concerned with purposeful decisions by firm to forget, but contrary to the emphasis in de Holan and Phillips (2011) on knowledge that is no longer desired, here we focus on knowledge that the firm still wants to keep, but is faced with a cost-benefit dilemma of doing so. There are two main strands of literature tied to organizational forgetting. The first one is on the existence and relevance of the phenomenon of forgetting. One of the earliest empirical applications at the individual level is Bailey (1989). Subsequent work has dealt with forgetting at the organizational level. Benkard (2000) analyzes the issue of forgetting in the context of a for-profit firm in the aircraft industry, a sector that is among one of the most widely cited examples of the learning curve. Darr et al (1995) show that knowledge of how to make pizzas depreciates over time across pizza stores. Argote et al (1990) find that knowledge acquired in production depreciates rapidly, and that the conventional measure of learning, cumulative output, significantly overstates the persistence of learning. Cattani, Dunbar and Shapira (2013) describe how, due to a lack of recognition that would only come a century later, the knowledge involved in the creation of Cremonese violins got lost over time and had to be recreated, since the interruption in production prevented the transmission of tacit knowledge across generations.

The second strand is connected to firms’ efforts either to prevent or to intentionally engage in forgetting, thus focusing on an important mediator of these efforts – organizational memory. Much of its research builds on the conceptualization of organizational memory provided by Walsh and Ungson (1991), where organizational memory is formed by “storage bins or retention facilities” that are capable of retaining information about past decisions. They propose the existence of five storage bins: individuals, culture, transformations, structures and ecology. While some
organizational theorists have argued the merits and limitations of this conceptualization (Rowlinson, Booth, Clark, Delahaye and Procter 2010), other management scholars have used it to argue how organizational memory can “buffer the organization from the disruptive effects of turnover (Argote et al., 1990), facilitate co-ordination (Yates, 1989), contribute to the development of innovative products (Hargadon and Sutton, 1997; Moorman and Miner, 1997)” and also be a key component in organizational learning (Olivera 2000).

However, the literature has been relatively silent on the strategic implications of forgetting\(^1\) (Benkard 2000, de Holan and Phillips 2011). De Holan and Phillips (2004b) describe the underexplored research question in the following way: “One of the reasons this (the fact that it is increasingly easier for organizations to acquire knowledge) is a problem is that maintaining knowledge is not without cost. A knowledge management framework focused only on acquiring and maintaining knowledge leaves firms in an increasingly difficult position as their stock of knowledge grows. Either they incur increasing costs to maintain ever greater amounts of knowledge or they risk losing critical competencies. A complete knowledge management strategy must therefore include a process for identifying knowledge that is no longer needed and the development of abilities to remove it from the organization. This is, obviously, a strategic decision as capabilities are lost along with the knowledge that supports them. But little has been written about evaluating knowledge or about how to remove unwanted knowledge from the organization” (p. 427)\(^2\).

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\(^1\) Benkard (2000) directly states that “To my knowledge, the strategic implications of organizational forgetting have not been studied” (p. 1034).

\(^2\) One exception is Besanko et al (2010), who incorporate forgetting into a learning-by-doing model and analyze how industry structure and its competitive dynamics are shaped by the presence of both. They find that a model with forgetting can give rise to aggressive pricing behavior, varying degrees of long-run industry concentration ranging from moderate leadership to absolute dominance, and multiple equilibria. Our approach is different from Besanko et al (2010) in that we are less concerned with deriving equilibrium properties of a highly-stylized model, and more concerned with deriving propositions that can be more easily tested against empirical data.
The next section tries to better understand how firms evaluate knowledge and decide *ex ante* either on the eventual removal of knowledge it has deemed unwanted, or on its preservation through investments in retention.

3. Determinants of the Strategic Forgetting Decision

The firm is faced with the decision to abandon or keep an asset that is yielding losses in the short-term (due to a sharp drop in demand that makes it redundant, for example), but might prove to be crucial in the medium to long term. This asset can be thought of as employees, a location or a machine. What is important to our point is that this asset embodies knowledge that cannot be easily recovered once it is disposed of. There is a small likelihood of the asset turning out to be useful in the future (in the example it is 10%). However, if the asset is useful and the firm abandons it, the firm will incur in a major strategic setback. Conversely, if the asset is useful but the firm keeps it, the firm gains a big leg up on the competition that faced a similar decision but made a different choice.

Figure 1: Strategic Forgetting Decision Tree
But what are the determinants of the decision of forgetting? As with any strategic decision under uncertainty, firms that are deciding on whether to give up on certain knowledge have to estimate the probabilities and the payoffs involved in the decision. These two elements can be broken down into five variables that the firm needs to estimate to take into consideration in its decision – the first variable reflecting the probabilities involved, the remaining four comprising different measures of the payoffs.

- First, it must estimate the likelihood that the knowledge will revert back to being useful and economically viable at some point in the future. Naturally, the more likely is the knowledge to return to prominence (or the higher is the perceived likelihood), the less likely is the firm to engage in strategic organizational forgetting.

- Second, it must estimate the net (opportunity) cost of maintaining the knowledge. For instance, a factor that decreases such opportunity cost is the absorptive capacity associated with the knowledge that would be kept (Cohen and Levinthal 1990). Furthermore, if the firm controls complementary assets, the more important they are to profiting from the knowledge, the less costly it is to abandon it, therefore the more likely is the firm to not retain the knowledge.

- Third, in the case it decides today to invest to keep this knowledge despite short term losses, it must estimate what will be the advantages it will have on competitors if the investment proves to be worthwhile and the knowledge makes a return to viability. Many of these advantages could be similar to those associated with being a first-mover, such as moving along a learning curve faster and getting a head-start in patent races (Lieberman and Montgomery 1988).
• Fourth, again in the case it decides to maintain the knowledge, it must estimate what are other potential uses of it, in different contexts from the one it was initially associated with in the firm – in other words, it must estimate what is its potential salvage value. For example, its potential salvage value could be associated with a retreat strategy, where firms try to reposition themselves in the demand environment, either by “retrenching into a niche position within the old technology’s home market, or by relocating the old technology into a new market application” (Adner and Snow 2010, p. 1656).

• Finally, in the case it decides today to cut its losses and abandon the knowledge, it must estimate what are the costs of recreating or reacquiring this knowledge in the future if it decides it is worth doing so. For instance, it must estimate how advantageous it will be in the future to be a buyer in the market for the returning knowledge. This will depend on, among other things: how codifiable will be this knowledge, so that a posterior acquisition of a machine or a scientist/engineer is enough to incorporate most of it into production; how strict will be the intellectual property around the knowledge.

The firm will decide to keep the knowledge if, when factoring in the five estimates, the final estimate of the net present value of the investment is positive. While the determinants of the strategic decision laid out above are more or less intuitive, this conceptual framework also leads to more novel insights that link structural features of the firm to the strategic forgetting decision. We now explore two that could yield empirical tests.

Firstly, we relate the likelihood of maintaining certain knowledge to whether the firm is a multinational. Previous work has explored the option value associated with a multinational structure. Kogut and Kulatilaka (1994) describe the flexibility associated with being a multinational firm: “The coordination of a network of subsidiaries dispersed throughout the world
provides an 'operating flexibility' that adds value to the firm. This operating flexibility is an advantage gained by being a multinational corporation. As developed below, it can be conceived as owning the option to respond to uncertain events, such as government policies, competitors' decisions, or the arrival of new technologies in some parts of the world” (p. 124). In their model, the existence of cost uncertainty leads firms to “buy” an option and create a foreign subsidiary, so that if costs turn out to be too high in one plant firms can transfer production to the other. Rob and Vettas (2003) describe how, when choosing between exporting or FDI, the presence of demand uncertainty will lead firms to choose a multinational structure that allows for an interior solution, again due to its option value.

Thus, the same option can serve to respond to the uncertainty around knowledge that may seem unprofitable to maintain in the short term but that could be useful again in the future. Therefore, it follows that the likelihood of investing to maintain certain knowledge will be positively related to the potential for redeployment of this knowledge to other contexts in the future, which in turn will be positively related to the firm being a multinational enterprise - since it would more easily find different (geographical) contexts to apply the knowledge. For this result to be observed empirically, the premise would be that the firm’s awareness of the advantages of flexibility, as well as the level of integration among subsidiaries, is high enough to compensate for eventual inertia and opportunism that could prevent the firm from taking advantage of this flexibility (Rangan 1998). In examining how flexible firms responses are to currency swings, Rangan (1998) finds evidence for firms taking advantage of the multinational structure.

In a similar vein, being a diversified firm will offer a similar kind of flexibility that can be used to deal with the uncertainty around the knowledge in question. However, the firm could only properly take advantage of this flexibility if management of the business group is centralized enough so that
managers can put this knowledge to use in different contexts. Therefore, it follows that *the likelihood of investing to maintain certain knowledge will be positively related to the potential for redeployment of this knowledge to other contexts in the future, which in turn will be positively related to the firm being a centralized diversified firm - since it would more easily find different (market) contexts to apply the knowledge.*

4. **The role of strategic responses to organizational forgetting in vertical integration decisions**

In this second part of the paper, we turn things around. Instead of asking what are the theoretical determinants of the decision to engage in or evade organizational forgetting, we now explore how thinking about the trade-offs involved in the strategic forgetting decision can enhance our understanding of corporate strategy. More specifically, we argue that thinking about vertical integration decisions through a strategic forgetting lens can bring additional explanatory power to the phenomenon of vertical integration, beyond that which is offered by traditional theories - especially transaction cost economics (TCE).

From the start, it is important to state that we do not claim that this alternative lens intends to be as encompassing as TCE in terms of number of empirical instances of vertical integration decisions that it is able to explain. Nevertheless, often it is first necessary for the conceptual and theoretical basis of a new explanation to be laid down so that *a posteriori* empirical inquiry, now armed with new conceptual and theoretical lenses, can be able to truly ascertain the number of cases covered by this new theory. In other words, while for now we make modest claims of the empirical adherence of this new explanation, and we only present one business case as partial and incipient evidence of a proof of concept, it is expected that eventually this explanation might turn out to be
more empirically relevant than they appear at first glance – especially because their empirical validation requires qualitative data, a type of which is usually not readily available.

4.1 Organizational forgetting and vertical integration

Since Coase (1937), the question of what determines the vertical boundaries of the firm has taken a central stage in the literature on the theory of the firm. The theoretical framework used to explain vertical boundaries that has gained most prominence is transaction cost economics (TCE) (Williamson 1975, 1985). Under this view, the main determinants of vertical boundaries are firms’ efforts to minimize transaction costs in a world where opportunism and bounded rationality are the norm. In the TCE story, transaction costs arise because efficient production requires specialized investments in physical and human assets, since the creation of customized assets enable firms to reduce production costs, meet quality requirements and innovate. However, such specialization creates the scenario that opportunistic agents pounce on to hold-up the firm. Because asset that are specific to a particular transaction lose value when used for other purposes, the transaction partner has incentives to renege on the initial terms of the contract and expropriate the returns to the asset. One could argue that the contract should be complete enough to anticipate all the possible ways the transaction partner could act opportunistically, but this is where bounded rationality, coupled with uncertainty, makes it impossible to write a contract that covers all contingencies. Furthermore, even if this were possible, monitoring, negotiating and enforcing all these contingencies would greatly increase transaction costs of market governance.

Therefore, even though the default mode of economic organization for TCE is market relations, if their transaction costs are sufficiently high this could lead firms to internalize the deployment of
technologies and capabilities in general through internal development or acquisition of another firm that contains the desired capabilities. This choice has transaction costs of its own, such as the need to implement coordinating and monitoring devices and to integrate the new organization into the existing one. Nevertheless, if the potential for opportunism in the market is high, employment contracts and authority-based relationships may be more efficient than market contracts (Schilling and Steensma 2002). Under this scenario, the firm has two forms of hierarchical governance it can resort to: it can try to develop the capabilities on its own, or it can try to acquire another firm that already possesses these capabilities. However, these options come with their own costs. There are a few reasons why it is difficult for firms to create capabilities of their own: the ability to do so may depend on unique historical conditions that no longer exist; the creation of a capability may be path dependent, where the creation process can be very time-consuming; the capability may be socially complex, because they depend on factors such as culture and reputation that are hard to change in the short-term through managerial action; and the capability creation process may involve causal ambiguity. Likewise, acquiring capabilities through acquiring other firms has its own difficulties: there may be legal constraints on an acquisition; an acquisition may reduce the value of the capabilities that are held in the acquired firm; an acquisition can be costly to reverse if it turns out not be valuable; there may be substantial “unwanted baggage” inextricably bound with the desired capabilities in the acquired firm; leveraging acquired capabilities throughout an acquiring firm can be costly (Barney 1999).

Against this TCE backdrop, our contribution to the literature on how firms decide on their vertical boundaries is to provide theoretical reasoning and incipient empirical support, through a case study that would eventually serve as a proof of concept, of how a firm’s strategic reaction to the threat of organizational forgetting in the relationship with a supplier that might no longer be available
can directly influence the boundary decision. The logic of this reaction can be based on three concerns regarding its suppliers: concern about the availability of capabilities that the firm considers essential for its production process; concern about the deterioration of the firm’s production process if it can no longer have access to a certain supplier, and therefore has to climb up the learning curve alongside a new partner in a new relationship; and concern with a significant increase in its transaction costs were the firm required to transact with a new counterpart.

Our argument can be summarized in the following way. Suppose that firm A has had a well-established, fruitful relationship with supplier B over the years. The latter has supplied A with a good or service that is deemed essential to A’s production process, and this transaction has been governed appropriately by A according to the tenets of TCE. One possibility is that the nature of the transaction was such that it left no room for opportunistic behavior on the part of B from the start of the relationship – we can assume that the nature of the good was such that both firms were able to enter into a contract that safeguarded them against all relevant contingencies. Another possibility was that the initial room for opportunism that might have existed was eliminated by the fine-tuning of contracting over time. In any case, in this scenario it makes sense for A to outsource this input from the market, instead of resorting to acquiring B. Additionally, due to the continuity of association, over time there was an increase in asset specificity as A becomes more reliant on B. Therefore, the ability of both firms to write a well-specified contract rules out the decision to “make”, and the generation of a transaction-specific asset reinforces the comparative advantage in governance that the “buy” option has by reducing production costs.

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3 It can be argued that when A made its initial decision of whether to outsource or produce internally the input, the choice to outsource at the time was made due to historical reasons that reflected different competitive conditions, or even due to a mistake (Jacobides and Hitt 2005). What is important for our argument is that this initial decision led to a path dependent trajectory that put A in a position where outsourcing became the correct decision from a governance standpoint.
Now suppose that an external shock brings down B’s revenues (outside of its business with A) to critical levels. This negative shock could take the form of either an objective degradation of B’s market position, B being poorly managed or having made bad decisions, or an interaction of the two. Regardless of the form, this shock leads to B’s conditions for survival becoming objectively untenable position in the market, or to A believing that B’s survival is threatened – our argument follows from either assumption, but we’ll proceed with the first for the sake of simplicity. B’s position is such that it cannot stay in business by relying on A’s patronage only – let’s suppose for the sake of simplicity that the shock was such that A was left as the only source of revenue for B. This is a worrying scenario for A, since at this point it has come to rely heavily on B to source a crucial input for its production process. If B goes bankrupt, any effort by A to either start to develop the capability to produce the input internally, or to develop a new relationship with a different supplier, would have a steep learning curve ahead either in terms of learning how to produce the input or in learning how to interact with the new supplier. Both scenarios would lead to significantly higher production costs in the short to medium run. It is at this point that, given that certain boundary conditions and parameters are in place, acquiring B becomes a desirable course of action for the firm that is seeking to preserve capabilities – in this case, capabilities that were developed within a partner firm and in tandem with the focal firm, but still capabilities. *More precisely, the management of firm boundaries, or the choice of governance regime, becomes an instrument in the arsenal of firms that face the strategic challenge of imminent organizational forgetting.* Figure 2 illustrates the argument.

A crucial component of the argument is the idea that firms develop relationships with suppliers that are very costly to replace. We base this argument on two different reasonings. The first is at the same time the most straightforward and possibly the most relevant one in empirical terms: the
supplier by itself has a capability which is fundamental to the performance of the buyer, and which cannot be replicated, at least not in a sufficiently timely and economical manner. By highlighting the fact that the supplier’s capability by itself is the source of uniqueness, we are stressing that our argument does not require TCE’s assumption of increased asset specificity. The argument is not necessarily that the supplier’s capability is fundamental to the buyer’s performance because this capability has become tailored to the latter’s specific production needs, and thus now represents a source of potential hold-up. The argument is that the knowledge embodied in the capability possessed by the supplier has become a significant input to the buyer’s production process, and it any risk of it disappearing may be too large for the latter to bear. Therefore, the risk the buyer is trying to mitigate by vertically integrating is not that of hold-up, but of knowledge disappearance.

Figure 2: Vertical Integration as a Response to the Threat of Organizational Forgetting

If Supplier X goes bankrupt

Acquiring Supplier X becomes a desirable course of action for the firm that is seeking to preserve capabilities
The second reasoning is the existence of relational rents (Dyer and Singh 1988) accrued from the development of relation-specific assets over time which would be lost if one of the partners were to exit the relationship. Relational rents are basically profits accrued from a specific buyer-seller combination that, due to its idiosyncrasies, are above and beyond what any other combinations could generate. Dyer and Singh (1998) enumerate four sources of relational rents. The first is investments in relation-specific assets, such as human cospecialization – the accumulation by transactors of transaction-specific knowhow through long-standing relationships. The second source is the existence of superior interfirm knowledge-sharing routines – regular patterns of interfirm interactions that permits the transfer, recombination, or creation of specialized knowledge. The third source is the leveraging of complementary resource endowments of a partner. The final source is the creation of more effective formal and informal governance mechanisms, which lower transaction costs in comparison with competitor alliances. Perhaps the best depiction of how two transactors learn to improve the formal safeguards of their governance arrangements is Mayer and Argyres (2004), who show how two partners adding contract provisions over time that were unrelated to transaction costs was an example of agents learning to contract over time. In terms of improvements of informal safeguards, the emergence of goodwill trust between partners, which requires “learning by interacting” and investment in resources, and for which there are no markets, is the most relevant example (Sako 1992).

In what ways are the arguments in this paper adding to what we already know from TCE? To highlight the differences, we first lay out what could be a baseline story that could be told using a TCE logic under the scenario described above. The story would be as follows. After a negative shock to the supplier, the buyer might become more inclined to vertically integrate, since it would be concerned with the costs derived from a situation where contracts are imperfect the buyer could
be held-up by an incoming supplier that could act opportunistically on the buyer’s predicament. The buyer could vertically integrate in two ways: it could acquire the original supplier; or it could attempt to internally develop the knowledge required to perform the activity.

One difference between this TCE story and ours has already been alluded to above: while asset specificity may be part of the reason why certain relationship-specific knowledge becomes crucial for a buyer to preserve, TCE only goes as far as predicting that the buyer would vertically integrate as way to prevent hold-up situations that arise from the existence of such specificity – a prediction that requires the assumption that contracts are very costly to write, monitor and enforce. On the other hand, the forgetting lens emphasizes the difficulty in building knowledge and how firms may change their corporate strategy in ways to preserve it. To be sure, part of the knowledge that the buyer might want to be preserve can be of the asset-specific kind, since this kind of knowledge can be just as costly or even impossible to recreate, but again, the argument is here is not tied to a concern with hold-ups - it is concerned with the preservation of unique capabilities and of relational rents. While in the TCE story the buyer would be willing to let go of the supplier’s knowledge and would recreate it internally to avoid the opportunism associated with entering a new relationship, our argument emphasizes that the buyer would be more worried with either the impossibility or the costs of recreating the knowledge.

Regarding relational rents, it does follow from TCE that concerns with preserving the source of relational rents related to both formal and informal longstanding governance arrangements could lead the firm to vertically integrate, since it could be worried about opportunism and poor contract formulation if it had to initiate a new relationship. In this sense, the forgetting lens complements TCE. For example, Leiblin and Miller (2003) hypothesize that the greater the number of prior outsourcing relationships with suppliers of a particular process technology, the smaller the
likelihood of vertical integration into production utilizing that technology, because of learning to outsource/contract. The forgetting lens would complement this hypothesis by predicting that, given a negative shock to the supplier, the likelihood of vertical integration would actually increase. Furthermore, that still leaves the three other sources - investments in relation-specific assets, existence of superior interfirn knowledge-sharing routines and the leveraging of complementary resource endowments of a partner – as reasons for vertical integration that go beyond TCE.

Both TCE and the forgetting lens talk about the cost to switching suppliers, so in this sense the two stories are similar. However, TCE emphasizes the part of the costs that have to do with the potential of reemergence of opportunism involved in having to develop a new relationship. Conversely, this paper is about the part of the costs that have to do with building new knowledge. Therefore, TCE would predict that if there is no room for opportunism in the new relationship, or if contracts can be easily fulfilled, then there would be no vertical integration – the buyer would just build a new relationship. Conversely, this paper’s prediction is that there would be vertical integration regardless of the level of opportunism or of difficulty in writing contracts in the new relationship, because knowledge is costly to build. Finally, it should be noted that, in complement to TCE’s focus on situations where the buyer has many options of suppliers available, the forgetting lens to vertical integration decision calls attention to the relevance of scenarios where the lack of alternative suppliers with comparable capabilities in the short run leads firms to vertically integrate as a way to prevent knowledge loss. While TCE is able to easily explain firm behavior when the potential number of suppliers goes from five to four, and eventually to three and so forth, the strategic forgetting lens is helpful to understand how firms behave when the potential number of suppliers can go from one to zero.
Before we move on to presenting some incipient empirical evidence that illustrates the arguments made above, we need to present some boundary conditions. Firstly, the knowledge the buyer wants to preserve cannot be easily codified or retained in other ways by the firm (Nelson and Winter 1982), so it has to resort to vertical integration since it cannot resort to organizational memory (Walsh and Ungson 1991). More specifically, the knowledge in question needs to have some mix of the following features: it is tacit, as opposed to articulable; even if articulable, it has not been articulated – for example, computer programs or manufacturing processes that have gone through so many changes that makes them irreconcilable to the original recorded design or plan; it it is not teachable; it cannot be observable in use, usually because of a secrecy requirement; it is complex, in the sense that the amount of information required to characterize the knowledge in question is large; and it is an element of a system, as opposed to being independent (Winter 1997).

Secondly, the buyer must be able to retain the knowledge that resides in the seller when acquiring it – for instance, human capital must remain available post acquisition. In fact, if this boundary condition does not hold, the firm can engage in horizontal diversification instead – it would enter new market segments as a way to generate new demand for the supplier it is trying to keep afloat. This condition introduces a possible extension to the theory that could be pursued in future research: horizontal diversification that is justified by the need to prevent knowledge loss, in a context of declining demand in the firm’s original market. For instance, firms could diversify so that they don’t have to stop progress in process innovation efforts that require continuity and scaling up. Alternatively, firms could try to find new markets as a way to keep in place firm-specific human capital that is costly to put together and recreate – e.g. high performance teams.

Thirdly, if the supplier is 100% vital to the buyer the arguments become moot, so it is important to have as a possibility that the buyer can stop engaging in the activity that requires the supplier,
and walk away from the relationship and eventually let the supplier fail. Similarly, a condition that should hold is that the supplier cannot raise prices to the buyer up to a level that it would put an end to its crisis – the price hike would have to be so high that the buyer would simply choose to walk away.

Finally, we need to justify why the supplier would not simply ride out the bad times, or credibly signal to the buyer that it could do so, given that the knowledge in question could still carry economic usefulness into the future. One possibility is that the buyer in fact has more information about this usefulness than the supplier – there is information asymmetry around the positive payoffs of the Keep/Useful branch of the decision tree in Figure 1. Alternatively, the buyer’s larger size and level of diversification could allow it to afford the commission error of investing to keep the knowledge and eventually going down the Keep/Not Useful branch – in other words, the error of omission to the buyer of letting the knowledge disappear could be much more costly. Conversely, the supplier cannot afford the commission error of staying in business and the knowledge not returning. In sum, the downside risk for the supplier is prohibitive, but it is palatable for the buyer given its size. This argument leads to the conclusion that the seller would have higher cost of capital than the buyer.

In sum, the argument made here is that organizations may integrate backward due to the need to preserve knowledge that is either embodied in the supplier itself, or takes the form of relational rents that are generated in the relationship with the supplier. An interesting parallel can be made with the classic idea from economics that the division of labor is limited by the extent of the market (Stigler 1951): because the extent of the market is not large enough to allow for the existence of standalone suppliers, the division of labor decreases through the incorporation of these suppliers by their customers.
4.2 Illustrating the importance of reacting to organizational forgetting to vertical integration decisions: a proof of concept

In this subsection, we present a case study by Christensen (1998) on a large manufacturing firm which illustrates how understanding certain firm actions as strategies to avoid organizational forgetting enhance our understanding of vertical integration decisions. It should be noted that, while the narrative of the case as described by Christensen and summarized below provides significant reasons to see it as representative of the theory, the content of the case is not enough in itself to rule out alternative explanations based on TCE to the firm’s actions. Hence, we treat the case as preliminary evidence, with more to be collected eventually – including interview and archival data from the firm.

4.2.1 The case of Vallourec

Vallourec is a diversified French industrial firm, which manufactured a range of metal components for the automobile and other industries in Europe and was one of the world’s largest manufacturers of seamless steel tubing used primarily in oil and gas exploration. This section, however, focuses on how over 15 years Vallourec became one of the world’s largest manufacturers of parts made by injection-molding powdered stainless steel.

In 1981, Vallourec’s main market was the production of seamless tubes of stainless steel, titanium, and other high-performance metals and alloys which were used in a variety of settings requiring tubing that could resist very high pressures in severe, corrosive environments, such as oil and gas exploration. One of Vallourec’s main competitive advantages was in its production process. But the new decade brought along a major challenge for the firm: the drastic decrease in the pace of
oil exploration due to the fall in prices of 1979, and therefore a corresponding decrease in Vallourec’s main market. Compounding the problem, Vallourec’s process made it uncompetitive in all but the high-end of the tubing markets, of which oil exploration had represented a large portion.

The possibility to get out of this bind materialized in the form of a Swedish specialty steel company called NorSteel. This firm had developed a pilot-scale demonstration of a process to manufacture powdered stainless steel, which represented an innovation that, if adopted by Vallourec, could lower its cost to a level that would enable it to compete in lower-priced segments of the tubing market. Whereas in conventional steel making molten steel was cast into slabs and then rolled into shapes such as sheets, beams and bars, Norsteel blasted a stream of molten steel with a jet of cold argon gas – causing it to atomize or solidify in tiny spherical particles. At pilot scale, NorSteel had shown that when its powders were forced at high temperature and pressure through a specially-designed extrusion die, the powders would fuse together to form a tube whose properties were similar to those Vallourec achieved in its billet-piercing process. In other words, this new process maintained the technical features of resistance required in the tubing market, but lowered cost enough that made it competitive in segments of the tubing market that went beyond the one Vallourec had set its foothold on.

Although it was hard to estimate the operating costs of NorSteel’s process at the scale required by the Montbard plant, the managers at Vallourec decided to make a bold bet on it. At first the two parts negotiated a license for the process, as well as a cash injection of French Francs (FF) 40 million by Vallourec alongside the license fee. This was necessary because the crisis in the Swedish steel industry at the time required ensuring that the technologists responsible for the
technology, and the raw materials it required, would remain available. In exchange for this investment, Vallourec received a 40% shareholding in NorSteel.

Despite the cash infusion Norsteel was in a more fragile state than before, and this jeopardized the continuing supply of powders. To assure this supply, Vallourec offered to take ownership of the firm for a symbolic purchase price. The cheap purchase turned out to be expensive, as it required closing facilities, replacing the management and making other necessary changes, leaving Vallourec with a FF 80 million bill - still half of what would cost to build a powdered metal factory from scratch.

Furthermore, after working on NorSteel’s process, Vallourec gained greater insight into why the former had been unprofitable: making powder is a scale-intensive process, and the market was not big enough to get costs low enough to make powdered metal parts a cost-effective alternative to machined parts. And since the MIM technology up to this point limited the industry to small, undercapitalized firms that only made small parts, these firms did not use much raw material. Thus, because Vallourec had decided to invest in this technology to reduce tube-making costs in Montbard, now the only way to achieve this goal was to somehow create a large demand for powdered stainless steel – it needed to help create an industry that made large parts in large volumes. This, it would need to enter one of the segments of the powdered metal market to create demand for it, and Vallourec chose to enter the metal injection molding segment. To this end, in 1992 Vallourec set up their own metal injection molding company called Impac Technologies.
4.2.2 Lessons from the Vallourec case

As they began to pursue a new innovation project in the firm, the managers at Vallourec decided to go beyond simply licensing the powdered metal technology being developed at NorSteel. Since Norsteel was facing difficulties in its home market and was thus in need of financial help, Vallourec decided to acquire a 40% stake in the firm as a way to provide it with a capital injection. By doing this, Vallourec was trying to ensure the availability of both the supply of steel powders, which represented the raw material for the process it was trying to codevelop with NorSteel, and of the NorSteel technologists who were responsible for the initial technological breakthrough and were necessary in working along with Vallourec engineers to bring it to scale. Furthermore, after noticing that NorSteel was deeper in crisis even after the initial capital injection, Vallourec decided to take full ownership of the firm. Although the purchasing price was symbolic, the acquisition was costly in terms of integrating the two firms. As we can see, the vertical integration decision was driven by the need to avoid organizational forgetting, which in this context meant keeping NorSteel in business. This ensured that the raw materials knowledge generated by this supplier, which probably could only exist in this organizational form and could not be embodied by single individuals or codebooks, could still be supplied. Not only that, Vallourec felt that it could not easily replicate the capabilities that had been developed by NorSteel. The case also illustrates how a horizontal diversification decision – Vallourec’s decision to go into MIM – can be driven by the need to avoid organizational forgetting on the part of a supplier.

Vallourec’s problem can be couched in terms of the decision tree in Figure 1 by changing the initial perspective of which agent has the knowledge – from the focal firm to the supplier. In this case, the knowledge not being useful in the short run is represented by the supplier NorSteel struggling to have a large enough market for its product, which embodies the knowledge in
question. The knowledge coming back to being Useful represents the market for NorSteel’s production picking up in the future. Going back to the five variables described in Section 3 that define the strategic forgetting problem, Vallourec’s decision to acquire NorSteel was driven by its belief that the knowledge possessed by the latter would provide the former with a significant leg-up on the competition once it became economically viable (variable 3), as well as by the belief that recreating the knowledge would be too costly if it were to disappear (variable 5). In terms of the payoffs of the decision tree, Vallourec estimated that the payoff of Keep/Useful, that is, the payoff associated with buying NorSteel and the market for the latter’s production picking up in the future, was too high to pass up the opportunity (which would imply choosing the Abandon branch) and warranted risking the Keep/Not Useful outcome.

5. Conclusion

This paper presented a theory to explain the rationale behind strategic decisions related to organizational forgetting, thus answering the call for research on the role of forgetting in organizations’ knowledge management efforts. The project also aims to extend and contribute to theories of vertical integration by taking a knowledge loss prevention approach to the phenomenon. This paper is also a first step of a broader intended research agenda on the strategic implications of organizational forgetting – at the firm, sector and regional levels, as well as implications for business and public policy. Future work can attempt to provide large scale empirical evidence that is consistent with the theoretical arguments presented here. For instance, for sectors where supplier capabilities or relational rents in general are very important for the firms in it, we could test if a negative shock to this sector’s suppliers are followed by a wave of vertical integration.
The complex trade-offs that managers face involving organizational forgetting can be ascribed to the fact that performing cost-benefit analysis around knowledge is inherently difficult, especially because it is very hard to estimate the benefits of knowledge. This inherent difficulty is one that policy makers dealing with regional economic development also need to face, therefore future work can also explore the implications of organizational forgetting for public policy. For example, how can regions preserve knowledge that could dissipate due to negative shocks, such as plant closures (Boschma 2015)? What kind of institutions (such as research centers, economic development agencies, state-owned enterprises) help in preserving regional knowledge, and how do they do it? What is the role of (interpersonal, interfirm) networks in this preservation process? What are the public investments necessary to achieve this outcome, and what are the trade-offs involved? In sum, how can regional strategy take a cue from corporate strategy and organizational theory in terms of how to think about knowledge preservation and organizational/regional memory? Answering these questions would represent progress on conceptualizing the role of the state as a strategist (Lenway and Murtha 1994, Lazzarini 2015), and they are particularly pertinent for emerging economies that receive knowledge-infused FDI, but who see this investment leave after a few years.
BIBLIOGRAPHY


Christensen, Clayton M. "Vallourec's Venture into Metal Injection Molding." Harvard Business School Case 697-001, November 1996. (Revised March 1998.)


