Overt Interfunctional Conflict (and Its Reduction Through Business Strategy)

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We study why production and sales departments tend to disagree, with the former wanting long production runs and the latter wanting a broad product line. We then analyze why these disagreements lead to overt conflict in which functional areas fight with each other by presenting arguments that damage each other's position. We show how the firm benefits from the information generated by this conflict. In spite of these benefits, the equilibrium conflict can exceed its profit-maximizing level. Finally, we show that concentrating innovative talent in only one department can help reduce interfunctional conflict.

1. Introduction

The objectives of a firm’s employees often differ. It is common, for instance, for different employees to covet the same promotion or for different divisions to want scarce investment funds for themselves. More closely related to this article, there appears to exist a canonical difference in the objectives of production and sales departments. As Seiler (1963) describes it, “Sales’ concern for meeting customers’ special desires was pitted against production’s concern for uninterrupted runs. . . .”

This article seeks to understand the source of this particular difference in preferences, and more importantly, it analyzes when these differences in preferences lead to overt conflict. Conflict is more than disagreement; it can only be said to arise when the parties take mutually opposing actions. The opposing actions of conflicting employees often involve presenting evidence against the course of action favored by their

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1 See also Dutton and Walton (1966), who quote sales officials as saying “Sales’ job is service—delivery when the customer wants it” while production officials say “Our goal is run orders efficiently. Many opportunities arise to reduce costs. . . . New items often give us problems. . . .” It should be noted that conflict between sales and production seems more prevalent than other forms of interfunctional conflict. Perrow (1970), for instance, reports: “Without exception, sales singles out production for the more negative rating on each of these four variables; and production returns the compliment by singling out sales for the most negative rating on each” (p. 78).
opponents as well as evidence for the course of action that they themselves favor. Morrill (1991), in particular, presents detailed depictions of this sort of conflict.

For example, Morrill describes a case in which a marketing executive “wanted to extend production (from five) to nine months per year to capitalize on expanding markets” while the head of operations opposed the expansion on the ground that it would jeopardize a quality control program that he had introduced. After several unsuccessful meetings, in which the two were unable to resolve their disagreement, the marketing executive said, “If you want war, fine.” Morrill (1991) goes on to say: “The ensuing months witnessed the outbreak of war between operations and marketing and their supporters: several presentation shoot-outs and duels between marketing and operations executives and managers . . .” Duels are described elsewhere in the article as situations where both sides present evidence for their proposal and attack the evidence presented by their opponent.

Because conflict involves the presentation of evidence, it provides information that is useful to top management in making decisions. Thus, as suggested by Woodward (1965) and Eccles (1985), conflict has beneficial aspects. Eccles, in particular, stresses the fact that conflict can help top management gather information. While conflict has this beneficial role in our model, it is nonetheless possible for there to be more conflict inside firms than is ideal from the point of view of the firm’s owners. The reason, as we show, is that there is only a tenuous relation between the individual employee’s benefit from conflict and the overall firm’s benefit.

For conflict to arise, there must first be a difference in the objectives of sales and production. In this article, this difference in objectives is due to differences in the specific human capital acquired by employees. We argue that the profitability of expansions in the product line depends to a great extent on the knowledge that sales employees have acquired about customers; it thus makes particular use of the human capital acquired by these employees. Similarly, an expansion in the scale at which existing products are produced benefits particularly from the knowledge acquired by incumbent manufacturing employees. Their preferences concerning expansions then differ because they want the firms to embark on expansions that make intensive use of the particular human capital that they have acquired. If the firm does this, it has no choice but to offer these employees a higher wage to retain them. Thus, our model of disagreement has some common elements with the Shleifer and Vishny (1989) model in which incumbent managers who invest in projects that make particular use of their abilities succeed in entrenching themselves.²

Our model of the actual dynamics of conflict is closely related to the “influence activities” of Milgrom and Roberts (1988). Just as in that article, each side spends resources in order to get its way. While heavily influenced by Milgrom (1988), Milgrom and Roberts (1988) and Meyer, Milgrom, and Roberts (1992), our model of conflict has some novel elements. In particular, we stress the amount of visible effort that parties spend in promoting their plan and casting aspersions on the plans that favor the other side. In the example of Dutton and Walton (1966), “production would exaggerate the difficulty it anticipated with a given request.” By contrast, Meyer, Milgrom, and Roberts (1992) stress the invisible effort that parties exert to make their own proposal look good. The difference between the two is that in the case considered by Meyer, Milgrom,

² The explanation is rather different from the view that employees who work in different functional areas have “conflicting ideas” (Seiler, 1963) or different “thought-worlds” (Dougherty, 1992). Both of these might be the result of attempts to conform to group norms (Neilsen, 1972). The difference is that if these are the sources of conflict, and, as Neilsen (1972) says “especially when members of conflicting groups identify cooperation with each other as antithetical to their ideals,” tactics involving attempts at attitudinal change may provide the only long-run hope for resolution. On the other hand, such tactics have no role in our model.
and Roberts (1992), the influence activity would be ineffectual if the firm knew how much effort had gone into exercising influence. By contrast, the costly actions we emphasize take place in equilibrium even if the effort that the parties incur is completely observable. The reason the firm pays attention to the arguments developed by the warring factions is that they reveal valuable information. Indeed, the firm may find it in its interest to encourage conflict by lowering the employees’ cost of both seeking and presenting evidence favorable to their position.

Nonetheless, conflict can be excessive if the firm is unable to limit its own share of the costs of gathering and communicating information. This leads us to study whether it is possible to reduce conflict by systematically favoring one department over the other. A department that understands that it is likely to lose any argument it initiates has a smaller incentive to expend resources developing arguments in the first place. Similarly, a department that is favored only rarely needs to protest a decision. The question then arises as to how the firm can effectively precommit to favoring one department. This will be difficult if the other department is able to develop credible arguments in its favor ex post. A commitment device that we explore involves creating departments that differ systematically in their abilities. That is, we assume that it is possible for the firm to systematically hire workers of higher caliber into one department than the other. If the firm does that, then the best opportunities for expansion will typically be generated by the “better” department. Knowing that confrontation on the facts will likely lead to victory for the stronger department, the weaker department has little incentive to do battle in the first place. Thus, having a “marketing dominant” or “manufacturing dominant” organization reduces conflict.

Along the same lines, the firm can be helped by a commitment to a business strategy. For example, one of Porter’s (1985) generic strategies is a strategy of “low cost” that involves, inter alia, efficient expansions of the scale of production. A “differentiation” strategy, on the other hand, relies on the marketing department’s ability to find niches that are profitable even when the good is produced at relatively high cost or on the ability of those involved in product design to develop new, or modify existing, products to meet customer needs. Again, the issue is how the firm can commit itself to a strategy that favors functional areas in this particular way. In the model we develop, the firm is able to do this by building up a core capability in that functional area. In other words, it can do it, once again, by hiring systematically more able people in one functional area than in the other.

In Section 2 we provide a basic building block of the article, namely a model in which employees in different functional areas have differing preferences with respect to direction in which the firm grows. Section 3 presents our model of overt conflict. In particular, it traces both the benefits and costs of having employees gather and present information that advances their cause. In Section 4 we then discuss how the commitment to a business strategy can reduce conflict. Section 5 concludes.

2. Differences in preferences

We suppose that there are two functional areas, which we denote as manufacturing, \( m \), and sales (or marketing), \( s \). In the first of the two periods we consider, the firm produces and sells one unit of a good we denote by \( a \). This requires the employment of \( n \) workers in each of the two functions. The resulting revenues, net of the cost of other material inputs, equals one. In the process of either producing or selling, employees acquire potentially valuable information. Employees in the manufacturing area

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3 This argument is related to the independently developed work of Dewatripont and Tirole (1995). They show that a principal who seeks to make a decision can improve on the information he gets by providing two agents different incentives that are based on outcomes of his decision.
learn how to produce this particular good more efficiently, and sales employees get to know the firm's customers.⁴

Rather than assuming that this knowledge is available regardless of who is employed by the firm, we assume that this knowledge resides in the employees themselves. In practice, some of the knowledge acquired "by doing" is probably embodied in procedures or routines. In other words, experience teaches that some procedures are more efficient than others. This procedural knowledge remains with the firm whether employees leave or not. Other knowledge (such as the tastes of potential customers or the best way to avoid maintenance problems on equipment) tends to reside in the heads of the employees themselves, although it can be passed from one employee to another by word of mouth.⁵

The simplest way to capture the existence of this embodied knowledge is to suppose that the number of new employees the firm needs to hire in the second period depends on the number of old employees it retains. If, for instance, all incumbent employees left in the second period and output remained unchanged, the firm would need to hire as many new employees in the second period as it hired in the first period. By keeping incumbent employees, the firm lowers its labor force requirements because the incumbent employees are not only more productive themselves but are able to train the new employees. Obviously, the required number of new employees depends also on the type of expansion that the firm pursues.

In the second period the firm can engage in two types of expansion. The first is to double the output of $a$, and the second is to add the product $b$ to the product line. It seems natural to suppose that if all incumbent employees left, the firm would need to hire $2n$ manufacturing and sales workers to double the output of $a$. We assume that by engaging in this expansion, revenues net of other material costs climb to $(1 + \beta_a)$, where $\beta_a$ is less than one. There are thus diminishing marginal returns to selling $a$. We further suppose that

$$2nw_0 > \beta_a,$$  

where $w_0$ is the wage that one must pay new employees if they expect to be hired only for one period. This assumption explains why the firm did not produce at this scale in the first period. In spite of (1), however, the expansion is potentially profitable in the second period because of the assumption made below that costs do not double if the firm holds on to some incumbent employees.

For symmetry, we assume that expanding the firm by adding $b$ also involves a doubling of the required workforce if no incumbent employees remain. Similarly, we assume that this expansion raises revenues net of materials cost by $\beta_b$. To ensure that this expansion also fails to be profitable in the first period, we make (1) hold for $\beta_b$ as well.

Naturally, fewer new employees are needed if incumbent workers remain. Let $x_i$ denote the number of employees who remain in function $i$. We then suppose that the number of new employees $e$ who need to be hired in function $i$ is given by

$$e_i^m(x_m, x_s) \quad \text{and} \quad e_i^s(x_m, x_s) \quad i = m, s,$$  

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⁴ On the manufacturing side, this is the standard learning-by-doing phenomenon of Arrow (1962), Searle (1945), and Rapping (1965).

⁵ The maintenance workers at the French tobacco monopoly studied by Crozier (1964) had exclusive knowledge of maintenance routines and passed it on only by word of mouth; they made sure that all maintenance manuals disappeared.
where the first expression applies when the firm expands its scale and the second applies when it expands its scope. Our earlier discussion suggests that

\[ e^i_m(0, 0) = 2n \quad \text{and} \quad e^i_l(0, 0) = 2n \quad (3) \]

\[ \frac{\partial e^i_m}{\partial x_m} + \frac{\partial e^i_l}{\partial x_m} < -1 \quad \text{and} \quad \frac{\partial e^i_m}{\partial x_i} + \frac{\partial e^i_l}{\partial x_i} < -1, \quad j = a, b, \quad (4) \]

which means that keeping an additional incumbent employee lowers the number who need to be hired by more than one. The basic motivation behind this assumption is that the incumbent employees have learned something while on the job in the first period. They may simply have learned to operate the equipment better, so that more than one new employee is needed to do as much work as an incumbent. Also, this knowledge may help them develop ideas for improving the production and marketing processes, resulting in fewer new employees having to be hired. Or, the existing incumbents may be able to help the new employees “move down the learning curve.” The greater the number of experienced employees who remain, the more time they have to devote to this “on-the-job training” function in addition to doing their own jobs.

To keep the analysis simple, we assume that the \( e \) functions are symmetric in the sense that

\[ e^a_m(x, y) = e^b_l(y, x) \quad \text{and} \quad e^a_l(x, y) = e^b_m(y, x). \quad (5) \]

This means that an expansion of \( a \) has the same consequences for manufacturing (sales) employees as an expansion of the product line has for sales (production) employees.

We turn now to the key determinant of the difference in incumbent employee preferences, namely the effect of the firm’s decision on employee wages. We calculate these wages assuming that there is an infinitely elastic supply of new workers in both activities at wage \( w_0 \). This does not mean that all the incumbent employees can be kept at this wage. The reason is that each employee gets an outside offer whose pecuniary value is \( w_0 \), but whose value to the employee may well differ as a result of nonpecuniary factors. The employees know their own outside offers before the firm decides what strategy to pursue. The firm, on the other hand, does not know the value of each employee’s offer. It knows only that they are drawn from the cumulative distribution function \( F \). What this means is that the firm faces an upward-sloping supply curve for experienced employees.

Consider first the case where the firm expands the production of \( a \). Denoting the wages of incumbent manufacturing and sales workers as \( w^a_m \) and \( w^a_s \) respectively, second-period profits equal

\[
1 + \beta_a - x_m w^a_m - x_s w^a_s - [e^a_m(x_m, x_i) + e^a_l(x_m, x_s)] w_0 \\
= 1 + \beta_a - nF(w^a_m) w^a_m - nF(w^a_s) w^a_s \\
- \left[ e^a_m(nF(w^a_m), nF(w^a_s)) + e^a_l(nF(w^a_m), nF(w^a_s)) \right] w_0, \quad (6)
\]

where, assuming an interior solution, \( w^a_m \) and \( w^a_s \) maximize this expression so that they satisfy
The inequalities in (4) imply that wages for incumbent employees will be greater than wages for new employees as long as $F'$ is positive and $F(w_0)$ is sufficiently small.\(^6\) Also, differences in the employment functions $e^a_n$ and $e^a_i$ generally imply that incumbent employees in manufacturing will earn wages that differ from those of incumbent employees in sales. The wage differences result from differences in the value (to the firm) of incumbent employees relative to the value of new employees. In particular, if

$$nF'(w^a_m) \left( \frac{\partial e^a_m}{\partial x_m} + \frac{\partial e^a_i}{\partial x_m} \right) w_o + w^a_m + nF(w^a_m) = 0$$

$$nF'(w^b) \left( \frac{\partial e^a_m}{\partial x_i} + \frac{\partial e^a_i}{\partial x_i} \right) w_o + w^b + nF(w^b) = 0.$$ \(^7\)

The second-order conditions imply that the wage in manufacturing should exceed the wage in marketing. The reason is that (8) implies that retaining an additional manufacturing employee reduces total employment by more than retaining an additional marketing employee would reduce it, assuming one starts with equal numbers of both types of employees. The result is that the firm seeks to retain more manufacturing employees, and this requires that they receive a higher wage.\(^7\)

In the case of an expansion in scope, wages for incumbents are $w^a_m$ and $w^b$, so that second-period profits equal

$$1 + \beta_b - x_m w^b_m - x_i w^b_i - \left[ e^b_m(x_m, x_i) + e^b_i(x_m, x_i) \right] w_0$$

$$= 1 + \beta_b - nF(w^b_m)w^b_m - nF(w^b_i)w^b_i$$

$$- \left[ e^b_m(nF(w^b_m), nF(w^b_i)) + e^b_i(nF(w^b_m), nF(w^b_i)) \right] w_0.$$ \(^9\)

Differentiating this expression with respect to the two wages, it becomes apparent that the symmetry condition (5) implies that $w^a_m = w^b$ and $w^a_i = w^b_i$.

Thus, if incumbent manufacturing workers get higher wages when there is a scale expansion, incumbent sales employees get a higher wage under an expansion of the product line. Our symmetry assumption is enough to ensure that whoever wins under one type of expansion loses under the other.

The particular condition (8), which is sufficient to ensure that marketing employees gain when the firm adds the product $b$, is appealing because it has a straightforward interpretation when the product $b$ is one that is originally suggested by marketing employees. One expects these employees to suggest products whose market they have come to understand as a result of their experience selling earlier products. Thus, good $b$ should be thought of as a good whose customers are known to marketing employees as a result of their sales of $a$. It thus seems reasonable to assume that if the firm does indeed proceed to produce and sell $b$, the presence of incumbent marketing employees leads to large reductions in labor requirements within the sales area. This is so both because the incumbent sales employees can tell the new hires where the customers are

\(^6\) If $F(w_0)$ is large, and especially if it is equal to one, maximal profits are not achieved at an interior solution. The firm is better off keeping all wages equal to $w_0$.

\(^7\) The source of these wage differences is thus the same as the source of wage _increases_ in Shleifer and Vishny (1989). They show that incumbent managers who make manager-specific investments (i.e., investments that would lose value if they were managed by new employees) raise their wages.
(the training argument) and because they have numerous ideas about how to reach these customers cheaply. The manufacturing employees, on the other hand, must put in place capacity to produce a new product, for which their existing expertise has limited applicability.

If, instead, the firm decides to grow by doubling the production of \( a \), the manufacturing employees can fully exploit their knowledge of that process both to train new manufacturing employees efficiently and to apply any new ideas they generated in the first period. The sales employees, by contrast, must figure out how to sell twice as much of the same product to the existing customer base or find new customers that were not previously being reached. Assuming that the existing customers are the “low-hanging fruit,” the incumbent sales employees do not have as many ideas for reducing the need to hire new employees if this type of expansion is pursued.

This fits with the observed tension between manufacturing and sales, which often takes the form of manufacturing “not wanting to be bothered” by marketing’s constant requests for new products or tweaking of the existing product line. It wants to be left alone to master production of the existing products. Sales, by contrast, wants all the tools at its disposal to satisfy customer needs. What this model suggests, however, is that these preferences are not the result of the employees in the different functions simply wanting to do their jobs better, but rather a result of their desire to improve their position within the firm.

Whatever the exact reason for the differences in the \( e \) functions, we will denote by \( \Delta \) the difference between \( w_m^a \) and \( w_s^a \). Consistent with the above discussion, though without loss of generality for what follows, we suppose that \( \Delta \) is positive. It is important to stress that these differences in wages need only arise in the second period of employment. When employees are originally hired in the first period they can all earn the same expected present value of wages. To see this, suppose that there is no discounting, that there is an ex ante probability \( \lambda \) that the firm will implement a doubling of \( a \) in the second period, and that the first-period wage in manufacturing equals

\[
y_1 = \left\{ \lambda F(w_m^a)w_m^a + \int_{w_m}^{w_s} z \, dF(z) \right\} + (1 - \lambda) \left\{ F(w_s^a)w_s^a + \int_{w_s}^{w_m} z \, dF(z) \right\}. \tag{10}
\]

Then, the expected present discounted value of a manufacturing employee’s earnings is equal to \( y_1 \). Thus, by suitable adjustment of the first-period wage, the firm can match the present discounted value of earnings that employees can earn elsewhere.

The symmetry of the \( e \) functions also implies that the overall wage bill is the same whether the firm expands the scale of \( a \) or adds product \( b \). This means that the difference in profits between expanding scale and scope equals

\[
V = \beta_a - \beta_b. \tag{11}
\]

The model implies no tight link between \( V \) and \( \Delta \). This creates inefficiencies because, as the next section shows, \( V \) is related to the firm’s benefit from conflict, whereas \( \Delta \) is what causes conflict to arise in equilibrium.

3. Battle mechanics

If the difference in the profitability to the firm of expanding its scale rather than its scope is known, there is little for employees to argue about. In practice, however,

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\( ^8 \) The link would obviously be tighter if the employees owned the firm. We are ruling out such ownership by assuming, implicitly, that the employees are too poor and risk averse to own the entire firm. In addition, we are ruling out contracts whose payments to employees depend only on the actual value of \( V \).
considerable uncertainty surrounds the profitability of a product expansion or a product introduction. To allay this uncertainty, top management gathers data on $\beta_a$ and $\beta_b$. To a large extent, these data come from the firm’s own employees. But once top management opens the door to input from its employees, these employees act in response to the wage difference $\Delta$.

In particular, employees will search for information that supports their own position as long as the cost to themselves is smaller than their expected gain. As we shall see, in our setting this implies that employees gather information only when two conditions are satisfied. First, the firm must currently be favoring the project that they oppose (otherwise there is no point in spending resources gathering information). Second, it must be possible to get the firm to adopt the employees’ favorite project as long as the information that is gathered turns out to be favorable. The result is that information gathering evolves over time, with the group that is currently “behind” seeking new information with which to change the decision.

Indeed, our model is closely patterned after the “duels” described by Morrill (1991). Morrill describes how the principals “carefully prepared their presentations” and presumably their counterarguments, since after the presentations the two contestants “began a give and take of questions, criticisms and rebuttals.” The process described by Morrill is one in which the facts are uncovered but, as in legal disputes settled in court, at nontrivial cost to the parties and the system.

We start by describing the types of information that employees can gather. We then discuss the conditions under which employees will gather information and compare these conditions to the information-gathering policy that is optimal from the point of view of the firm.

Our model is one in which the parties are able to present credible arguments and counterarguments about the true value of the two $\beta$’s. Thus, the employees’ evidence determines the firm’s estimate of the relative profitability of expanding scale rather than expanding scope. We suppose that there are two signals that convey credible information about $V$, and we denote these by $S_m$ and $S_s$. Information about the value of the first signal can be obtained by manufacturing employees, while information about the second can be obtained by sales employees. Each of these independent signals can take on two values that we treat, without loss of generality, as being zero and one. Each of these signals is equal to one with probability $P$, and we suppose that $V$ is equal to

$$V = v + \delta(S_m - P) - (S_s - P).$$

Taking expectations on both sides, it follows that $v$ is the ex ante expectation of $V$ when the value of the two signals is unknown. Similarly, the independence of the two signals implies that the expectation of $V$ conditional on $S_s$ being equal to one and on being ignorant about $S_m$ equals $[v - \delta(1 - P)]$.

Thus, a positive value of $S_s$ lowers the estimate of the relative benefits from raising the output of $a$ by $\delta(1 - P)$. Whether the information contained in the signal is information that makes the increase in $a$ less attractive or whether it is information that makes the increase in scope more attractive does not matter to the employees. In practice, however, one of the easiest credible pieces of information that employees can obtain concerns the cost to one’s own department of implementing the project that favors the other department. This is consistent with Dutton and Walton’s (1966) finding that departments tend to complain that it is difficult to follow the other department’s wishes.
For concreteness, and consistent with (12), we thus suppose that the firm’s estimates of the \( \beta \)'s are given by

\[
\beta_a = \frac{v}{2} - \delta(S_x - P) \quad \text{and} \quad \beta_b = \frac{v}{2} - \delta(S_m - P).
\]

(13)

Thus, indeed, having the signal of the sales employees equal one reduces the attractiveness of expanding the output of \( a \), and having the signal of the manufacturing employees equal one reduces the attractiveness of adding a product.

To know the realization of \( S_m \) (or \( S_x \)), one must expend resources.\(^9\) We denote the cost of obtaining a signal by \( q \), and we assume that the \( q \)'s for \( S_m \) and \( S_x \) are independent draws from a distribution whose cumulative distribution function is \( G \). We assume that the employees themselves know the realization of their own \( q \) when they decide whether or not to acquire their signal, but that top management does not know this realization. Moreover, we let the employees themselves pay a fraction \( \gamma \) of the cost \( q \) of learning their signal, with the fraction \((1 - \gamma)\) being paid by the firm itself.\(^10\) We suppose that if a group of employees gathers a signal equal to one, it can credibly demonstrate this realization to top management.

We also assume that top management knows whether or not a group of employees investigated the value of its signal. This assumption is not crucial, in that the unique equilibrium we derive remains an equilibrium in which top management cannot distinguish between employees who do not search for their signal and employees who learn that their \( S \) is zero but choose not to reveal it. However, as we discuss in the Appendix, when these two types of employees are indistinguishable, there are realizations for \( v \) where this equilibrium is not unique.

We suppose that events unfold in the following sequence. The firm starts out with its estimate \( v \) of \( V \). Either group can then spend its own realized value of \( q \) to gather its own signal and reveal it to the firm. After this signal is revealed, the other group has another chance to gather and reveal its own signal, and then the final decision is made.\(^11\)

We conduct the analysis in this section assuming that \( v \) is positive. When \( v \) is negative, the analysis is the same with the roles of manufacturing and sales employees reversed. If \( v \) is positive and neither group learns the value of its signal, the firm chooses to produce a second unit of \( a \), so the manufacturing employees are better off. There is then no incentive for the manufacturing employees to gather information on \( S_m \) before the marketing employees collect and reveal information about \( S_x \). If the marketing employees never collect this information, the manufacturing employees save \( \gamma q \) by not collecting information on \( S_m \). The same is true if the sales employees learn that \( S_x \) is zero. Finally, if the sales employees demonstrate that \( S_x \) is zero, the manufacturing employees lose nothing by postponing their learning of \( S_m \) until the value of \( S_x \) becomes known.

Suppose that \( v \) is positive, the sales group has collected its signal, and \( S_x \) is equal to one. If \( v - \delta(1 - P) \) is positive, the conditional expectation of \( V \) remains positive, so the manufacturing group continues to be favored and has nothing to gain from

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\(^9\) Without these costs, the employees would simply reveal their \( S \)'s. See Farrell (1986) for a discussion in a different context.

\(^10\) The assumption that the firm incurs some of the cost of the employee’s influence activities because it is impossible to prevent the employee from carrying them out during working hours is present in Milgrom and Roberts (1988) as well.

\(^11\) One can think of the firm as setting two deadlines, \( t_1 \) and \( t_2 \), with \( t_2 > t_1 \). If it gets no new information from its employees by \( t_1 \), the decision is made at that point. If it does get information by \( t_1 \), it waits until \( t_2 \) to make its decision, thereby allowing one more round of information gathering.
learning its signal. The interesting case is when \([v - \delta(1 - P)]\) is negative, so that the firm would add the product \(b\) if it had no information about \(S_m\). The manufacturing workers at that point have an incentive to learn \(S_m\). If it turns out that \(S_m\) is zero, the firm starts producing good \(b\), but this outcome also prevails if the manufacturing employees fail to search for their signal. On the other hand, if \(S_m\) proves to be equal to one, the firm reverts to expanding the output of \(a\).

Thus, by learning \(S_m\), the manufacturing workers who would have remained anyway stand to gain \(\Delta\) with probability \(P\). The manufacturing workers who leave even when the firm doubles the output of \(a\) gain nothing, while the manufacturing workers who stay only if the firm expands \(a\) gain an intermediate amount that depends on the value of their outside offer. We suppose that only the employees who remain for sure need to incur the cost \(\gamma q\) of learning \(S_m\). They find it in their individual interest to do so as long as

\[
\frac{\gamma q}{x_m^b} \leq P\Delta \quad \text{or} \quad q \leq \frac{P\Delta x_m^b}{\gamma}.
\]

Thus, the probability of such a search for \(S_m\) conditional on \(S_s\) being equal to one is

\[
G(q_2), \quad \text{where} \quad q_2 = \frac{P\Delta x_m^b}{\gamma}.
\]

We now turn to the question of whether the marketing group, which is not favored by \(v\), spends resources to find its signal. With probability \(P\) this leads to a favorable signal, but this in turn triggers a search by the manufacturing employees with a probability given by (15). By protesting, the sales employees who remain with the firm regardless of the type of expansion thus gain \(\Delta\) only with probability \(P[1 - G(P\Delta x_m^b/\gamma)P]\). They will gather information about their signal if

\[
q \leq q_1, \quad \text{where} \quad q_1 = \frac{P\Delta x_m^a}{\gamma}[1 - G(q_2)P].
\]

Since \([1 - G(q_2)P]\) is smaller than one, it is apparent that the cutoff \(q_1\) in this equation is smaller than the cutoff \(q_2\). The reason is that the first group to protest, the marketing group, cannot be sure to win even if its signal is favorable, while the group favored by the initial estimate \(v\) does win when its signal equals one.

Because of the possibility of the arguments and counterarguments, or “protests,” the firm ends up following an expansion different from the one suggested by \(v\) with probability \(G(q_1)P[1 - G(q_2)P]\). This change of plans takes place only when the employees reveal valuable new information; thus, the adversarial process has value. But there is still the question of how the information actually gathered compares with what is optimal for the firm. We now consider this question.

We do this in two steps. First, we consider the firm’s profitability assuming that it must get information in the sequence considered above. In other words, the information

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12 This assumption could be problematic if the firm were able to learn the identity of those who spend resources protesting (since they would be earmarked as having low outside wages). We assume that the firm has no way of carrying out this identification. Alternatively, we could assume that all employees must spend the necessary resources and that they find it in their interest to do so because their alternative wage is not yet known when they protest. The analysis would be essentially unchanged, but the formulas determining the level of \(q\) that leads employees to search are somewhat more complex.
it gets is based on two cutoffs, \( q_1 \) and \( q_2 \). The first of these represents the cutoff level of \( q \) for the marketing employees (i.e., those not favored by the decision based on \( v \)), while the second represents the cutoff for the manufacturing employees in the case where the marketing group succeeds in having a signal equal to one. By computing profits as a function of \( q_1 \) and \( q_2 \), we can compare the profit-maximizing cutoffs and compare them to the values given in (16) and (15) respectively. After we consider this specific sense in which conflict is either too limited or excessive, we consider more generally the question of whether employees search for signals in a way that is optimal for the firm.

Each time the employees search, the firm incurs a cost of \((1 - \gamma)q\). However, when computing the cost of conflict to the firm, one must take into account that employees take their personal cost of conflict into account when choosing a job. Consider then a firm that makes its employees incur an expected cost of conflict of \( Q \). In the first period, the firm must pay wages that convince employees that the present value of their compensation is \( \gamma_1 \), and a calculation analogous to the one in (10) implies that the firm must thus pay \( Q \) more in the first period. Thus, we compute firm profits at the moment of decision making as a function of \( q_1 \) and \( q_2 \), supposing that the firm pays the total cost of search \( q \).

With these cutoffs, there is a probability \([1 - G(q_1)]\) that the marketing employees do not search. Since the manufacturing employees do not search after this, the firm then expands \( a \) and expects to earn \( v/2 \). With probability \( G(q_1)(1 - P) \) the sales employees search but \( S_s \) proves to equal zero. The firm expands \( a \) again but now expects to earn \( (v/2 + P\delta) \). With probability \( G(q_1)P \) the marketing employees demonstrate that \( S_s \) equals one. Conditional on this, there is a probability \([1 - G(q_2)]\) that the manufacturing employees do not search, a probability \( G(q_2)(1 - P) \) that they search and find \( S_m \) to equal zero, and a probability \( G(q_2)P \) that they find \( S_m \) to equal one. The expected profits in these three cases are, respectively, \((-v/2), (-v/2 + P\delta), \) and \((v/2 - \delta(1 - P))\). Only in the last of these cases, where both signals equal one, does the firm expand \( a \); in the other two it introduces \( b \). Thus overall profits equal

\[
\begin{align*}
\left[1 - G(q_1)\right] & \frac{v}{2} + G(q_1)(1 - P)\left(\frac{v}{2} + P\delta\right) - \int_{q_1}^{\tilde{q}_1} \left(z_1 + P \int_{z_2}^{\tilde{q}_2} dG(z_2)\right) dG(z_1) \\
+ G(q_1)P\left[1 - G(q_2)\right] & \frac{-v}{2} + G(q_2)(1 - P)\left(\frac{-v}{2} + P\delta\right) \\
+ G(q_2)P & \left(\frac{v}{2} - (1 - P)\delta\right)
\end{align*}
\]

\( (17) \)

For the expectation of profits

\[
\begin{align*}
\frac{v}{2} & + \left(\int_{q_1}^{\tilde{q}_1} -z_1 + P \left[\delta(1 - P) - v + \int_{z_2}^{\tilde{q}_2} (Pv - z_2) dG(z_2)\right] dG(z_1)\right) \\
= \frac{v}{2} & + \left(\int_{q_1}^{\tilde{q}_1} \left[\delta(1 - P) - v + \int_{z_2}^{\tilde{q}_2} (Pv - z_2) dG(z_2)\right] dG(z_1)\right).
\end{align*}
\]

\( (18) \)

In this formula we have obviously neglected first-period revenues as well as the other components of labor costs. The expression in (18) has a straightforward interpretation. The first term equals the level of profits the firm expects without information. The first integral then states that as long as the \( q \) for sales employees is below \( q_1 \), the firm can expect to pay \( q \) and with probability \( P \) gain \([\delta(1 - P) - v]\) by changing its decision. If this gain does materialize, and the \( q \) for manufacturing employees is below \( q_2 \), the firm can expect to pay this further \( q \) and, with probability \( P \), gain \( v \) by changing the decision once again.

Differentiating (18), the optimal values for \( q_1 \) and \( q_2 \) are
\[ \bar{q}_2^* = P \nu \]  
\[ \bar{q}_1^* = P \left[ \delta (1 - P) - \nu \right] + \left\{ P \int_0^{q_2} (P \nu - z_2) dG(z_2) \right\}. \]

Comparing (19) and (14), it is apparent that the cutoff \( q \) for the manufacturing employees is too high (so that they pursue too many counterarguments) if
\[ \nu < \frac{\Delta x^b}{\gamma} \]
or if the value to the firm of an improved decision \( \nu \) is low relative to the rents gathered by the employees who stay anyway.

A similar comparison between (20) and (16) shows that protests by the employees who are not initially favored by \( \nu \) occur too often if
\[ \left[ \delta (1 - P) - \nu \right] + P \int_0^{q_2} (P \nu - z_2) dG(z_2) < \frac{\Delta x^a}{\gamma} \left[ 1 - G \left( \frac{P \Delta x^b}{\gamma} \right) P \right], \]
which, again, involves a comparison of the firm’s benefits from changing its decision with the increased rents that accrue to employees.

One clear implication of (16) and (14) is that the firm can always increase the frequency of arguments and counterarguments if it can reduce the fraction of information costs \( \gamma \) that is paid for by employees. Presumably, it is possible to lower \( \gamma \) at least to some degree by giving employees more leeway to use the firm’s resources to uncover information. As long as it is possible to lower \( \gamma \) in this way, the firm can avoid being in a situation where there is insufficient conflict.\(^{13}\) On the other hand, if it is difficult to monitor employees’ use of firm resources to gather information, \( \gamma \) may be quite low and conditions (22) and (21) may be satisfied as soon as the firm becomes willing to listen to arguments and counterarguments.

One potential solution to the excessive use of arguments is to be unwilling to listen. If the firm can do this, it can simply pursue the course of action suggested by its prior information \( \nu \). The result is that its profits fall by the amount in the expression in curly brackets in (18). This is advantageous if this expression is negative but is deleterious otherwise. The problem with this instrument is that it is very blunt. When the \( q \)'s are low (particularly when they are zero), the firm wants to incorporate the information contained in the two signals. Thus, even when the equilibrium cutoffs \( q_1 \) and \( q_2 \) are too high, the firm may well prefer the outcome with conflict to the one that results from eliminating all employee-provided information. A better solution would be to tax employees who provide information and thereby, in effect, raise \( \gamma \). This solution, however, may be unavailable to the firm.

Obviously the resources spent by employees in uncovering favorable signals are a form of the influence activities, i.e., activities designed to capture organizational rents, studied by Milgrom and Roberts (1988) and Meyer, Milgrom, and Roberts (1992). The difference is that in our model the firm can tell whether the employee has spent resources or not. In particular, we have assumed that the credible signal is available only if the employee does actually spend the effort.

\(^{13}\) Whether it is in fact possible to lower \( \gamma \) arbitrarily is, of course, an open question. Insofar as \( \gamma \) represents psychological costs of being in a conflictual situation, such lowering may not be possible.
Nonetheless, the firm pays attention to the signal. The reason is that in our model, unlike theirs, the signal obtained by the employee is in fact truly informative instead of being a form of noise added to the true signal. Thus, the firm is not faced here with the need to subtract its estimate of the degree to which the employees have sugarcoated the information they provide. One advantage of our formulation as a model of conflict is that the conflict is out in the open; everyone knows that the information presented by the combatants is really meant to capture rents. Thus, spending resources simply to spruce up the look of a project is likely to be relatively ineffectual: the opponents will be sure to point out that the argument lacks substance. By contrast, the setting of Milgrom and Roberts (1988) is one in which attempts to make one’s credentials look good regardless of one’s true qualifications are likely to be more successful. The reason is that they consider a group of employees, each of which would like to be promoted to a “key” position. If concerns for privacy prevent employees from seeing the credentials presented by their competitors, they are not in a good position to neutralize purely cosmetic arguments made by these competitors.

If both (22) and (21) are satisfied, both sets of employees incur search costs that are too high. The still-open question is whether one or the other of these conditions is more likely to be violated in practice. This turns out to depend crucially on the value of \( v \). For sufficiently low \( v \), (21) is satisfied because the firm has little to gain from a successful counterargument by manufacturing employees. On the other hand, a low \( v \) makes (22) less likely to be satisfied because the expression on the left-hand side of (22) is decreasing in \( v \). When \( v \) is relatively low, the firm would like to encourage the sales employees to find the value of \( S \), because the benefits from adding \( b \) when \( S \) equals one are particularly high in this case. Higher values of \( v \) make protests by sales employees less profitable, so they lead the firm to prefer a lower cutoff \( q \) for the marketing group.

Interestingly, this does not mean that the equilibrium cutoff \( q \) in marketing is necessarily larger than the optimal \( q \) when \( v \) is near the maximum possible value that is consistent with protests. This highest possible value is \( 6(1 - P) \); higher values of \( v \) mean that protests by sales employees are never successful. Even when \( v \) is near this value, (22) can be violated. The reason is that there is an “option value” associated with obtaining a signal \( S \) that is equal to one. This signal gives the firm the option of obtaining a second signal, namely \( S_m \), and the overall value of this option is given by the term in curly brackets in (20).

We now show that, more generally, the sequence by which employees search for information may be suboptimal. Suppose in particular that the realized value of \( q \) for the manufacturing employees is very low relative to the realized value of \( q \) for the marketing employees. Then, (16) is likely to be violated so that the marketing employees do not protest and neither side learns the value of its signal. If the firm had full control over the information-gathering process, however, it might well choose to learn the value of \( S_m \). The knowledge that \( S_m \) is zero would lead it to scuttle the expansion of \( a \) even when \( v \) is positive as long as \( (v - P\delta) \) is negative, and this would raise profits by \( (P\delta - v) \). Manufacturing employees, on the other hand, would never explore the value of \( S_m \) under these circumstances (i.e., in the absence of a successful protest by marketing employees). In effect this information-gathering process never succeeds in getting employees to gather information that can only be costly to them, even though such information can be quite valuable to the firm.

4. **Generic strategies**

   We now consider whether a choice of a business strategy can reduce conflict in cases where this conflict is excessive because the cutoffs \( q_1 \) and \( q_2 \) are too high. To
the extent that a business strategy makes it clear that the firm will favor one functional area over another, conflict can be reduced because the favored area will have less reason to protest. Moreover, the functional area that expects to lose will not find it as advantageous to gather information about its signal.

Porter (1980) describes two generic strategies, one focused on “low cost” and the other on “differentiation.” A firm committed to a generic strategy might plausibly consistently favor one functional area, or one set of employees, over the others. For example, a firm that seeks to achieve its business objectives by “low cost” will typically stress scale over scope and, hence, manufacturing over sales. A firm that seeks success by “differentiation” will typically stress innovation, product enhancements, customer responsiveness, and so on. This in turn will tend to favor employees in sales and marketing, as well as others involved in product innovation and design, over those involved in production.

Alternatively, rather than thinking of this in terms of generic strategies as in Porter, one might conceptualize the firm’s business strategy in terms of its “core capabilities” as in Prahalad and Hamel (1990). If those core capabilities are associated with a specific functional area, then so too will be the business strategy. Indeed, the acquisition of core capabilities of this type can make it credible that the firm will indeed favor one area over another. We pursue this possibility in this section by supposing that the firm can make some initial investments that commit it to being “manufacturing dominant” or “marketing dominant.”

To analyze the effect of these investments, we suppose that the $\beta$’s are given by

$$
\beta_a = \frac{\nu}{2} - \delta(S_s - P) + c_m \omega \quad \text{and} \quad \beta_b = -\frac{\nu}{2} - \delta(S_m - P) + c_s \omega. \tag{23}
$$

When $c_m$ and $c_s$ are zero, this is identical to (13). So what we are adding to the earlier analysis is the possibility of spending resources to change the value of one or both expansion projects by $c_m \omega$. We suppose in particular that the firm can raise the value of $c_m$ (or $c_s$) from zero to one by spending resources in the first period. We suppose that the total costs of doing so equal $Y(c_m + c_s)$. It is natural to interpret the raising of a particular $c$ as acquiring particular competence in one area. By raising $c_s$, for instance, the firm becomes particularly good at expansions in the product line. This type of competence might be acquired by hiring particularly competent people in marketing, i.e., by hiring people who are particularly good at spotting what product other than $a$ the customers will want. Similarly, hiring particularly innovative people in the manufacturing function might ensure that, ex post, the doubling of the output of $a$ involves lower costs.

We consider the effect on profits of changes in the $c$’s for two different levels of $\omega$. First, we suppose that $\omega$ is extremely large, so that if one $c$ equals one and the other $c$ is zero, the decision always favors the group whose $c$ is positive. Second, we analyze the opposite extreme in which $\omega$ is arbitrarily small. For both cases we show that the existence of excess conflict can, under some circumstances, make it more attractive to raise $c$ in one functional area only.

**The large $\omega$ case.** We carry out the analysis of changes in $c$ assuming that, ex ante, $\nu$ has a distribution that is symmetric around zero, and we denote $\nu$’s cumulative distribution function by $H$. We suppose the support of this distribution extends from $-\bar{\nu}$ to $\bar{\nu}$. The symmetry around zero means that unless a core capability is acquired, either functional area is equally likely to be favored by the firm’s expansion.
We first compute expected profits assuming that both c’s are zero. This requires, essentially, that one use (18) and integrate over all the possible realizations of v. Taking into account that protests will not take place if v exceeds $\delta(1 - P)$, the resulting expected profits are

$$
\int_{0}^{\bar{v}} \frac{v}{2} dH(v) + \int_{0}^{\min(\bar{c},(1-P))} \left[ -z_1 + P\left[ \delta(1 - P) - v + \int_{q_1}^{q_2} (Pv - z_2) dG(z_2) \right] dG(z_1) dH(v) \right. \\
+ \int_{-\bar{c}}^{0} \frac{-v}{2} dH(v) \\
+ \int_{\max(-\bar{c},(1-P))}^{0} \left. \left[ -z_1 + P\left[ \delta(1 - P) + v + \int_{q_1}^{q_2} (-Pv - z_2) dG(z_2) \right] dG(z_1) dH(v) \right) \\
= 2 \left( \int_{0}^{\bar{v}} \frac{v}{2} dH(v) \\
+ \int_{0}^{\min(\bar{c},(1-P))} \left[ -z_1 + P\left[ \delta(1 - P) - v \\
+ \int_{q_1}^{q_2} (Pv - z_2) dG(z_2) \right] dG(z_1) dH(v) \right) , \right) \right)
$$

(24)

where the last expression is obtained using the symmetry of the distribution of v. We denote by $\pi_0$ the profits in (24) when the cutoffs for the q’s are chosen by the employees themselves, and we denote by $\pi_0^\pi$ the profits the firm would earn if it could choose these cutoffs. Obviously, $\pi_0^\pi$ is generally larger than $\pi_0$, particularly if the firm is constrained in its ability to raise $y$ so that the equilibrium q’s are too large.

Now suppose that the firm lets one c, say $c_m$, be equal to one and that $\omega$ is larger than $[\bar{v} + \delta(1 - P)]$. This means that V is positive even if $S_x$ turns out to equal one and $v$ is equal to its smallest value, $(-\bar{v})$. Thus, the firm always expands $a$. Second-period profits net of the costs of conflict are then

$$
\int_{-\bar{v}}^{\bar{v}} \frac{v}{2} dH(v) + \omega = \omega, \tag{25}
$$

where the equality is due to the symmetry of the distribution of v.

If, instead, the firm sets both c’s equal to one, profits net of conflict costs are given by $(\pi_0 + \omega)$ in the case where employees choose the cutoffs for the q’s. With both c’s set equal to one, profits equal $(\pi_0^\pi + \omega)$ if the cutoff q’s are optimal for the firm. We now show that the difference between $\pi_0$ and $\pi_0^\pi$ both encourages the firm with inefficient conflict to let one c be equal to one and discourages it from setting two c’s equal to one. To see this, note that the difference in expected profits between having one c set equal to one and having none in the case where employees choose their cutoffs for q is $\omega - Y - \pi_0$. In the case where the firm chooses the cutoffs for the q’s, the corresponding difference is $\omega - Y - \pi_0^\pi$. The former expression is obviously larger. Moreover, the difference between the two expressions is larger the further are the
employee-picked cutoffs for $q$ from the ones that the firm would pick. Thus, the firm benefits more from setting a single $c$ equal to one when conflict is excessive (so that the employees pick cutoffs that are too large) and when it is insufficient (so that the employees pick cutoffs that are too small).

Similarly, the difference in profits from setting the two $c$'s equal to one and only letting one $c$ have this property is $\pi_0 - Y$ when the employees choose the cutoffs, while it equals $\pi_0^* - Y$ when the firm chooses the cutoffs. The former is clearly smaller. Moreover, the difference between the two grows with the costliness of conflict. It also grows when the level of conflict falls further below its optimal level, i.e., when the cutoff $q$'s fall starting from a level where they are already below the $q^*$'s.

We have thus shown that the acquisition of one strong core competence is more attractive when the level of conflict is either inefficiently high or inefficiently low. The reason for this is that the acquisition of this competence eliminates both actual conflict (because one set of employees is guaranteed to win) and the firm’s benefits from conflict. It is important to stress that adopting a strategy of this sort can be attractive even if eliminating conflict by other means is not. That is, it is possible for $\omega - Y - \pi_0 > 0$ and $\pi_0 - Y < 0$, so making one $c$ be equal to one is optimal even if

$$\pi_0 > 2 \int_0^\infty \frac{\nu}{2} dH(\nu),$$

so that with both $c$'s set to zero, the firm is better off listening to its employees than simply making its decisions based on $\nu$.

**The small $\omega$ case.** We now consider the opposite extreme, in which $\omega$ is extremely small. Since $\omega$ is small relative to $\bar{\nu}$, we simplify by assuming that $\bar{\nu}$ equals infinity. To study this case, we compare once again the profits when both $c$'s are zero to the profits when one of the $c$'s (say $c_m$) is equal to one while the other ($c_s$) is equal to zero. It follows from (23) that this is equivalent to maintaining the assumption that $c_m$ is equal to one while $c_s$ is equal to zero and comparing the profits with a positive $\omega$ to those where $\omega$ is zero, since ignoring the costs of setting $c_m$ equal to one, the latter are the same as those where both $c$'s are zero. We carry out this latter comparison because the notation involved is somewhat simpler. In particular, for small $\omega$, this difference in profits can be approximated by $d\pi = d_1\omega + d_2(\omega^2/2)$, where $d_1$ and $d_2$ are, respectively, the first and second derivatives of profits with respect to $\omega$ evaluated at the point where $\omega$ is zero.

We shall show that increases in $\omega$ can be profitable in circumstances where this leads to reduced conflict. In particular, we show that increases in $\omega$ do reduce the total incidence of protests when the density of $\nu$ has a single peak. If, in addition, conflict is sufficiently costly, the firm gains from this increase in $\omega$ (while it loses if the number of protests is excessively low). On the other hand, when the density of $\nu$ has a single trough at $\nu$ equal to zero, increases in $\omega$ tend to increase the incidence of overt conflict, so that the firm benefits from this only if the $q$'s are relatively low.

With $c_m$ equal to one and $c_s$ equal to zero, the firm will choose to expand $a$ if its estimate of the two signals satisfies $\nu - \delta(S_s - P) + \delta(S_m - P) + \omega \geq 0$.

This means that in the absence of signals, the firm would expand $a$ if $\nu + \omega$ were positive. The sales employees could then expect to change this decision by learning their signal as long as $\nu$ is between $[-\omega]$ and $[\delta(1 - P) - \omega]$. Thus, the sales employees will protest with positive probability when $\nu$ lies in this interval. Similarly, the manufacturing employees will initiate the search for a signal with positive probability if $\nu$ lies between $[-\delta(1 - P) - \omega]$ and $[-\omega]$. This is the range where the firm would add
b if it got no additional information but where protests by manufacturing have a chance of being successful.

The result is that, using the method of derivation that led to (24) and recalling that we are now assuming an infinite $v$, profits equal

$$\int_{-\omega}^{-\delta(1-P)} \frac{v}{2} dH(v) + \int_{-\omega}^{\infty} \left(\frac{v}{2} + \omega\right) dH(v)$$

$$+ \int_{-\omega}^{-\delta(1-P)-\omega} \left\{ \int_{q_1}^{-\delta(1-P)-\omega} -z_1 \right\}$$

$$+ P\left[\delta(1-P) + \omega + \int_{q_1}^{q_2} \left(P(-v-\omega) - z_2\right) dG(z_2) \right] dG(z_1) \right\} dH(v)$$

$$+ \int_{-\omega}^{-\delta(1-P)-\omega} \left\{ \int_{q_1}^{-\delta(1-P)-\omega} -z_1 \right\}$$

$$+ P\left[\delta(1-P) - \omega + \int_{q_1}^{q_2} \left(P(\omega) - z_2\right) dG(z_2) \right] dG(z_1) \right\} dH(v).$$

(26)

The first derivative of these profits with respect to $\omega$, $d_1$, is

$$d_1 = H(\infty) - H(-\omega) + \frac{\omega}{2} [h(-\omega) - h(\omega)]$$

$$+ \left\{ h\left[\delta(1-P) - \omega\right] - h\left[-\delta(1-P) - \omega\right] \right\}$$

$$+ \left\{ \int_{q_1}^{q_2} z_1 + P \int_{q_1}^{q_2} \left[z_2 - P\delta(1-P)\right] dG(z_2) \right\} dG(z_1) \right\}$$

$$\times \left[ PG(q_1) \left[1 - G(q_2)P\right]\right] \left[ (H(-\omega) - H(-\delta(1-P) - \omega)) \right]$$

$$- \left[ (H\left[\delta(1-P) - \omega\right] - H(-\omega)) \right].$$

(27)

Assuming $h$ is continuous at $\omega$ and at $\delta(1-P)$, the limit of this derivative as $\omega$ tends to zero is simply $\frac{1}{2}$ (since, at this limit, $H(-\omega)$ equals $\frac{1}{2}$ while

$$\left[ H\left[\delta(1-P) - \omega\right] - H(-\omega) \right]$$

equals $[H(-\omega) - H(-\delta(1-P) - \omega)].$\textsuperscript{14} Thus, $d_1$ is independent of the intensity of conflict and the effect of this intensity on the profitability of raising $\omega$ depends on $d_2$. Differentiating the expression in (27), this equals

\textsuperscript{14} If $h$ falls discontinuously at $\delta(1-P)$, (27) implies that $d_1$ rises with both $q_1$ and $q_2$ as long as the latter exceeds $\rho\delta(1-P)$. Thus, in this case, excess conflict makes an increase in $\omega$ desirable. The reasons are very similar to those we give below for the case where $h$ is continuous and concave. Similarly, the fact that $d_1$ falls when the cutoffs rise if $h$ increases discontinuously at $\delta(1-P)$ has a similar rationale to the analogous result when $h$ is continuous and convex.
\[ d_2 = h(\omega)\left[ h(-\omega) - h(\omega) \right]/2 - \omega \left[ h'(\omega) - h'(-\omega) \right]/2 \]
\[ \times \left\{ h'(\delta(1 - P) - \omega) - h'(\delta(1 - P) + \omega) \right\} \]
\[ \times \left\{ \int_{z_1}^{q_1} [z_2 - P\delta(1 - P)] \, dG(z_2) \, dG(z_1) \right\} \]
\[ \times \left[ PG(q_1)(1 - G(q_2)P) \right] \]
\[ + \left\{ h(\delta(1 - P) - \omega) - h(-\omega) \right\} + \left\{ h(-\delta(1 - P) + \omega) - h(\omega) \right\}, \]

where primes denote derivatives. Using the symmetry and continuity of \( h \) and evaluating at \( \omega \) equal to zero, this is

\[ d_2 = h(0) - 2h'(\delta(1 - P)) \int_{z_1}^{q_1} [z_2 - P\delta(1 - P)] \, dG(z_2) \, dG(z_1) \]
\[ + 2PG(q_1)(1 - G(q_2)P)\left[ h(\delta(1 - P)) - h(0) \right] \]
\[ = h(0) - 2h'(\delta(1 - P)) \]
\[ \times \int_{z_1}^{q_1} [z_1 - \kappa P\delta(1 - P) + P \int_{z_2}^{q_2} [z_2 - (1 - \kappa)P\delta(1 - P)] \, dG(z_2) \, dG(z_1), \]

where
\[ \kappa = \frac{h(-\delta(1 - P)) - h(0)}{\delta(1 - P)h'(\delta(1 - P))}. \]

The sign of \( d_2 \) depends on characteristics of the distribution of \( v \). Suppose first that \( h'(\delta(1 - P)) \) is negative. This occurs, in particular, when the density has a single peak at \( v \) equal to zero. It follows then that as long as \( q_1 \) exceeds \( \kappa P\delta(1 - P) \) while \( q_2 \) exceeds \( (1 - \kappa)P\delta(1 - P) \), \( d_2 \) is strictly increasing in \( q_1 \) and \( q_2 \). If, instead, the \( q \)'s are below these critical values, \( d_2 \) declines when the \( q \)'s rise. Thus, as in the high \( \omega \) case, excessively high levels of conflict (in the sense of high levels of the two \( q \)'s) make increases in \( \omega \) more profitable. Moreover, when the distribution of \( v \) is strictly concave, as in Figure 1, \( \kappa \) is positive and strictly less than one. This means that there are straightforward sufficient conditions for \( d_2 \) to be increasing in \( q_1 \) and \( q_2 \). All that is needed is for the cutoff \( q_2 \) to be larger than the optimal cutoff \( \bar{q}^*_z \) when \( v \) takes the highest possible value consistent with protests (which equals \( \delta(1 - P) \)) and for the cutoff \( q_1 \) to be larger than \( \bar{q}^*_\omega \) in the case where one ignores the option value in (20) and \( v \) takes the smallest possible value consistent with protests (which equals zero).

Now suppose that \( h'(\delta(1 - P)) \) is positive, which occurs when the density of \( v \) reaches its lowest point for \( v \) equal to zero. Then, \( d_2 \) is strictly decreasing in \( q_1 \) and \( q_2 \) when \( q_1 \) exceeds \( \kappa P\delta(1 - P) \) and \( q_2 \) exceeds \( (1 - \kappa)P\delta(1 - P) \). Moreover, when the distribution is strictly convex, \( \kappa \) is again between zero and one. This means that increases in the cutoffs of the \( q \)'s above the respective \( \bar{q}^*_z \) now tend to reduce the desirability of increasing \( \omega \).
One can obtain intuition for these results by looking at Figures 1 and 2. When the density of $v$ has a single peak, as in Figure 1, increases in $\omega$ tend to reduce the integral of $h$ between $[-\delta(1-P) - \omega]$ and $[\delta(1-P) - \omega]$. The reason is that the region of integration moves to one side, where the density $h$ is lower than in the middle. As a result, increases in $\omega$ reduce the overall probability of objections, since these are the realizations of $\omega$ for which someone has a positive probability of searching for a signal. This tends to be desirable when there are too many objections. By the same token, it tends to be undesirable when there are too few protests.
Similarly, when the density of $v$ has a minimum at $v$ equal to zero, as in Figure 2, increases in $w$ tend to increase the integral of $h$ between $[-\delta(1-P)-\omega]$ and $[\delta(1-P)-\omega]$. The reason is that the $h$'s are now larger away from the middle of the distribution. Thus, an increase in $\omega$ now increases the overall frequency of protests. This becomes less desirable as protests become too frequent.

It is worth noting that even when $h$ reaches a maximum at $v$ equal to zero and $h'(\delta(1-P))$ is negative, it is possible that increases in the cutoff $q_1$ above the maximum $\tilde{q}_1^*$ do not make it more desirable to increase $\omega$. This can occur as long as $h$ is convex, though only if it is also declining between zero and $\delta(1-P)$. With this combination, $\kappa$ can be larger than one so that $\tilde{q}_1^*$ can be below $\kappa\delta(1-P)$. The result is that when $q_1$ is below $\kappa\delta(1-P)$, $d_2$ is declining in the $q_1$. The intuition for this result is the following. When $h'$ is declining, an increase in $\omega$ reduces the overall frequency of conflict. In particular, there is a fall in the probability that manufacturing employees will find it in their interest to protest because the ex ante value of $V$ favors the sales department. Specifically, the probability that $V$ falls in the region that triggers immediate search by manufacturing employees falls by $[h(-\omega) - h(-\delta(1-P)-\omega)]$. One negative effect of this is that these protests, if successful, lead the firm to gain $\omega$. Thus, when $[h(-\omega) - h(-\delta(1-P)-\omega)]$ is large relative to the overall reduction in protests, which depends on $h'(\delta(1-P))$, the firm does not gain by increasing $\omega$.

So far, we have shown that the costliness of conflict can, when the distribution of $v$ has a unique local maximum, encourage the firm to raise $\omega$ under the assumption that a single $c$ is equal to one. This brings up the question of whether the firm would be better off raising $\omega$ and making both $c$'s equal to one. If both $c$'s are one, the first derivative of profits with respect to $\omega$ is equal to one independently of the level of $\omega$, since the firm gets $\omega$ regardless of the decision it makes. The reason is that when both $c$'s equal one, the realizations of $v$ for which conflict erupts remain the same. Thus, if the cost of raising $\omega$ when both $c$'s equal one exceeds $\omega$ itself, raising $\omega$ is clearly not attractive. Now suppose that, correspondingly, the cost of raising $\omega$ when only one $c$ equals one exceeds half of $\omega$ itself. Our analysis implies that with a single $c$ equal to one, raising $\omega$ can be profitable when the distribution of $v$ is single peaked because this can make $d_2$ positive. Thus, a strategy of hiring innovative employees in only one department can be made attractive by the costliness of conflict.

While our model has focused on the disagreement over a single decision, hiring competent employees in only one department will generally mean that this department generates better ideas time after time. Thus, the firm will tend to adopt this department’s ideas time after time. The hiring of innovative employees in one department is thus consistent with a strategy that favors this department. One attractive feature of this model is that it fits the conventional wisdom which suggests that firms whose strategies favor one department also tend to have more able employees in that department.

Our motivation for generic strategies has some similarities to the motivation for narrow strategies that we developed in Rotemberg and Saloner (1994). In that article, narrow strategies ensured that a single business area had a sufficient incentive to innovate. Narrowness produced this benefit because it was impossible to motivate employees directly by paying them for their innovative effort. The only incentive payment available was a bonus that was paid when a group’s idea was implemented. Thus, it was important to restrict the firm’s choice of implementable projects to those generated by the employees whose effort was particularly productive.

Here the firm is always involved in the two activities, but it nonetheless has a choice of whether the employees in each department should be of equal quality. Making the two sets of employees have unequal quality also restricts the range of projects that the firm is likely to implement, since projects generated by more able employees are more attractive. Thus, this is akin to having a “narrow” strategy. But the models differ
in that the firm’s problem in Rotemberg and Saloner (1994) is that it is difficult to induce productive employees to exert sufficient effort, whereas here the problem is, at least sometimes, that they exert excessive effort looking for information.

5. Conclusions

We have presented a model where conflict between marketing and manufacturing departments arises in equilibrium. Because this conflict is rooted in the different incentives faced by the two departments, social activities where the two groups are supposed to become friendly with each other are unlikely to reduce tension. What is more, depending on the parameters, the firm may find it profitable for this conflict to continue. The reason is that conflict is productive: it produces valuable information about the firm’s opportunities.

That is not to deny the costs of this conflict. Indeed, we have shown that the firm may benefit from reducing conflict by systematically hiring more able employees in one functional area. This reduces the need for protests by the favored group (since it gets its way without protests) and can also reduce the protests of the other group (because it expects to lose its appeals). The benefits of pursuing a strategy of this kind are greater if the costs of conflict are high and if the value of the information generated by the conflict is low.

A firm that uses this method of avoiding conflict will tend to have a strategy that is internally and externally consistent, in the jargon of the strategic management literature (see Andrews (1971), for example). For example, a firm that pursues a “low cost” strategy in its product markets will tend to have internal policies that favor manufacturing and that revolve around a core competence in that area. Moreover, the fact that the firm has a core competence in manufacturing, and favors manufacturing internally, will tend to avert protests by marketing employees. It will then be less likely to spot opportunities in the area of product differentiation and will instead expand in ways that leverage its manufacturing capability. This, in turn, will make manufacturing even stronger and exacerbate the prior tendencies. What we have shown is that if the costs of conflict are large, internally consistent and self-reinforcing business strategies may be optimal.

By focusing only on interfunctional conflict, this article has left out conflict within functional areas. Yet such conflict is present in firms as well, particularly in R&D departments where different innovative employees compete to have their ideas adopted. It would therefore be interesting to extend the model to allow for this sort of conflict. This would allow one to ask whether systematically favoring one functional area by filling it with able employees raises or reduces conflict inside the favored department.

Appendix

Unobservable search. We characterize the equilibria that arise when search is unobservable. We show that the unique equilibrium with observable search remains an equilibrium in this case but that the fact that search is unobservable creates additional equilibria for certain realizations of \( v \). These multiple equilibria differ from each other in the beliefs that the firm has when, at a particular point, a group is unable to prove that its signal equals one. We show in particular that for \( v \) between \( \delta(1 - P) \) and

\[
\delta(1 - P) + PG(q_2)\delta(1 - P)/(1 - PG(q_2)),
\]

the equilibrium in which neither group searches, which we developed in the text, coexists with an equilibrium in which the sales employees search for \( S \), at the first opportunity. Also, when \( v \) is negative but greater than \(-PG(q_1)\delta(1 - P)/(1 - PG(q_2))\), the equilibrium where the manufacturing employees search first coexists with one where the sales employees search for \( S \), at the first opportunity.

Suppose first that the marketing group has already demonstrated that \( S \) equals one. We now investigate the set of beliefs that leads manufacturing employees to search for \( S \), as long as their \( q \) is below \( q_2 \). For the
manufacturing employees to do this, it must be the case that obtaining an $S_m$ equal to one leads the firm to expand $a$, while the lack of proof that $S_m$ equals one leads it to produce $b$. The former requires that $v$ be positive (otherwise, the firm produces $b$ even when both signals are positive). If the firm believes that the manufacturing employees do search for $S_m$ as long as $q$ is below $q_1$, the firm’s estimate of $V$ supposing that the manufacturing employees do not prove that $S_m$ equals one is

$$
\frac{(1 - G(q_2))(v - \delta(1 - P)) + G(q_2)(1 - P)(v - \delta(1 - P) - \delta P)}{1 - PG(q_2)}.
$$

This estimate is negative, so the firm is justified in adding $b$ if

$$
v \leq \delta(1 - P) + \frac{PG(q_2)\delta(1 - P)}{1 - PG(q_2)} .
$$

We now consider the incentives faced by the marketing employees to search for $S_m$. They will be willing to be the ones that search initially for their signal if their $q$ is less than $q_1$ and if the lack of proof that $S_m$ equals one leads the firm to expand $a$ while the proof that $S_m$ equals one leads the firm to add $b$ unless the manufacturing employees show that $S_m$ equals one as well. Assuming (A1) holds, the marketing employees are willing to believe that finding an $S_m$ equal to one is enough to lead the firm to add $b$ unless $S_m$ equals one as well. Moreover, a positive $v$ is sufficient to ensure that the firm expands $a$ if the marketing employees fail to prove that $S_m$ equals one. The reason is that even if this is regarded as proving the marketing employees have not searched, it leads the firm’s ex post estimate of $V$ to be positive. Thus, when (A1) is satisfied and $v$ is positive, there exists an equilibrium where the marketing employees search initially if their $q$ is below $q_2$ and the manufacturing employees also search if $S_m$ equals one and their $q$ is below $q_1$.

Note, however, that for any $v$ greater than or equal to $\delta(1 - P)$, there is also an equilibrium where the firm does not expect the manufacturing employees to search for their signal when $S_m$ is proved to equal one. As a result, the fact that they do not report a signal $S_m$ equal to one in this case is not informative, and the firm proceeds to expand $a$. If the employees know that the firm will update its beliefs in this way, the manufacturing employees have no incentive to learn $S_m$ even when $S_m$ equals one, so they refrain from doing so. As a result, the firm’s belief about the lack of search by manufacturing employees becomes rational as well. Moreover, given these beliefs by the firm, the marketing employees do not search for their own signal when $v$ exceeds $\delta(1 - P)$ (doing so would lead to a net loss, since the manufacturing employees would not be expected to search and the firm would expand $a$). This latter equilibrium is the unique equilibrium that emerges when search is observable, as we saw in the text. The reason is, in effect, that when $v$ exceeds $\delta(1 - P)$, the manufacturing employees gain by proving to the firm that they have not searched. This leads the firm to expand $a$ at no cost to its manufacturing employees.

Now suppose that $v$ is negative, so that the manufacturing employees would not search if $S_m$ were proved to equal one. The marketing employees might still search initially if the firm responded to the proof that $S_m$ is equal to one by adding $b$ while it responded to lack of evidence about $S_m$ by expanding $a$. If the firm responded in this way, the marketing employees would search as long as their $q$ were no greater than $q_2$. If the firm believes that the marketing employees search for their signal using this cutoff, it should expand $a$ in the absence of proof that $S_m$ equals one as long as

$$
\frac{(1 - G(q_2))v + G(q_2)(1 - P)(v + P\delta)}{1 - PG(q_2)}
$$

is positive. This is satisfied as long as

$$
v \geq -\frac{PG(q_2)\delta(1 - P)}{1 - PG(q_2)} .
$$

(A2)

so that it is consistent with a negative $v$. The negative $v$ in turn is sufficient to ensure that a signal $S_m$ equal to one leads the firm to add $b$; since the manufacturing workers cannot be expected to respond, the posterior estimate of $V$ is $v - \delta(1 - P)$, and this is negative. Note that again, these equilibria with negative $v$ are ruled out when search is observable because the marketing employees can prove that they have not searched. With a negative $v$, it is strictly in the interest of the marketing employees to prove this because it leads the firm to add $b$ unless the manufacturing employees prove that $S_m$ equals one.

We can now pull this discussion together by describing all the possible beliefs (and thus equilibria) that are possible. Suppose first that neither group produces evidence that its signal is equal to one. The first
thing the firm might believe is that, independently of the realized $q$'s, neither group searched for its signal. This would then lead the firm to implement the expansion suggested by $v$. As we saw, this belief is consistent with equilibrium behavior if the absolute value of $v$ exceeds $\delta(1 - P)$. Indeed, this is the only circumstance in which this belief is consistent with subgame-perfect equilibrium behavior because, when $v$ is smaller, the group that loses from the expansion based on $v$ would search if its $q$ were below $q_1$. Second, the firm can believe that the marketing group would have searched if its $q$ were below $q_2$. This is consistent with equilibrium behavior if $v$ is positive and (A1) is satisfied. Third, the firm can believe that the marketing group would have searched if its $q$ were below $q_2$. This requires that $v$ be negative and (A2) be satisfied. The conditions for believing that manufacturing would have searched if its $q$ were below $q_1$ and $q_2$ are analogous.

If one group, say the marketing group, succeeds in producing a signal equal to one, and the manufacturing group doesn't respond, the firm can believe either that manufacturing would never have searched or that it would have searched if its $q$ were below $q_2$. The former is consistent with equilibrium if (A1) is satisfied and $v$ is positive; the second requires that $v$ be greater than $\delta(1 - P)$. Note that, for $v$ between $PG(q_2)[1 - P](1 - PG(q_2))$ and $\delta(1 - P)$ (if this interval is nonempty), the only equilibrium with unobservable search is the equilibrium we focused on in the text.

The multiplicity of equilibria when the act of searching is unobservable leads one to ask whether the firm can select the equilibrium in a way that is optimal for itself. In particular, it might be able to choose the beliefs that it has at different nodes in the game to maximize its profits, assuming of course that these beliefs are consistent with equilibrium behavior by the employees. The question would then be whether the firm benefits from having the marketing employees protest initially when $v$ exceeds $\delta(1 - P)$. If there is "too much" conflict, in the sense that $q_1$ tends to be too large, the firm might be better off preventing these protests altogether. Whether it is reasonable to suppose that the firm can prevent these protests by believing that the manufacturing employees do not search for $S_\sigma$ when $v$ exceeds $\delta(1 - P)$ is left for further research.

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