SMALL FORCES AND LARGE FIRMS: FOUNDATIONS OF THE RBV*

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<u>Abstract</u>

The article presents a synthesis of several papers I have written, mostly in the economics literature, since the publication of "A Resource-based View of the Firm" (Wernerfelt, 1984). The starting point is a very small force: The reduction in bargaining costs when several bargains are pooled into one. I show how one can construct a theory of the firm based on this force and defend the theory by arguing that it makes predictions consistent with several stylized facts. In addition, the theory suggests that firms should decide on their strategy and scope based on excess capacity of productive resources – exactly like the RBV.

1. **INTRODUCTION**

The paper is about firms. Most readers of this journal are teaching about firms, managing firms, or advising clients who run firms. And yet, scandalously, we have no generally accepted answers to the most basic questions about them. What is a firm? When should we use them? How do they work differently than markets? Why do some of them diversify? The following proposes a unified theory that speaks to these questions and at the same time can serve as a micro-foundation for the Resource-Based View of the Firm (Wernerfelt, 1984). The literature contains many deep and well-travelled lines of reasoning about these matters and I do not expect to fully convince the reader. However, given the importance of the issues, I will be happy just to stimulate more discussion of, and work on, foundational issues in strategic management.

The argument starts with a discussion of a "small" force; the difference in bargaining costs between negotiating a single average price for a lot of services versus negotiating separate prices for each individual service. To think of bargaining costs as being subject to economies of scale in this sense is not counterintuitive: When faced with the task of trading thirty small items, most people would prefer to negotiate once over the bundle rather thirty times on an item-by-item basis. I will show how economies of scale in bargaining costs can help us explain why we have firms. The theory is consistent with many stylized facts about firms: They are used when more frequent and diverse adaptations are needed, when the benefits of specialization are smaller, and when it is costly to switch suppliers. Based on this concept of the firm, we can immediately derive several differences between firms and markets: Who should own the productive assets?, How does the steepness of incentives compare?, How do the patterns of communication differ?, and who should make which decisions? We then look at the role of human assets in the growth and heterogeneity of firms and in the process re-discover one of the central tenets of the RBV, the idea that strategy and scope are based on leveraging excess capacity of resources.

In contrast to the complex interactive effects favored by much recent theoretical literature on the firm, many of the arguments offered here rely on comparatively simpler and more direct forces. This simplicity often has the effect of turning received wisdom on its head. Instead of "I am the boss because I own the assets" (Grossman and Hart, 1986), it is "I own the assets because

I am the boss". Employment contracts are low-powered, not because employees are supposed to, by themselves, allocate some time to aspects of the job that are not contractible (Holmstrom and Milgrom, 1991), but because the boss might intervene and order them to do something not covered by the incentives. There is less communication between than within firms, not because firms can commit to treat bad news gently, but to protect the firm's bargaining power. Decision rights are not yielded to enhance investment incentives (Aghion and Tirole, 1997), but because it is too costly to agree on everything. Rather than, "since contracts are incomplete, they can be renegotiated" (Hart and Moore, 1990), it is "contracts can be left incomplete, because they can be renegotiated".

2. SUB-ADDITIVE BARGAINING COSTS

Using language from physics, economists often refer to bargaining costs as "frictions" in the workings of the economy (Williamson, 1981). The analogy to air-resistance etc. suggests two implications: That friction safely can be ignored for many purposes (apples dropping), and that it is critical in others (flight). Economists have largely embraced the first implication, but not the second. Bargaining costs are almost universally abstracted from. In particular, perfect and costless "Coasian bargaining", though originally introduced as part of a reductio ad absurdum (Coase, 1960), is now a standard assumption (Hart, 2008).

The demonstrated success of frictionless models is certainly part of the reason for this, but the amorphous nature of bargaining costs is another. While it often does not matter exactly why bargaining is costly, the costs themselves come in many guises. The most immediate examples are that bargaining is unpleasant, takes time, and is subject to strategic inefficiencies (Myerson and Satterthwaite, 1983). But in many cases more substantial costs may be incurred in the form of investments in bargaining power (Tullock, 1980), time spent preparing to bargain (Busse, Silva-Risso, and Zettelmeyer, 2006), and post-bargaining aggrievement (Hart and Moore, 2008). Sources of bargaining costs differ from situation to situation and no single source is universally important. Furthermore, apart from the quite unsatisfactory "fixed cost of bargaining", there is no unified way to model all of these types of costs. So it is perhaps not surprising that bargaining costs have a bad name in economics.

Conceding that bargaining costs generally are "small", they are most likely to matter where a lot of bargains have to be struck in a short amount of time. Intuitively, it would seem to be "expensive" if executives and production foremen have to bargain with their subordinates at each turn. Consistent with this, the analysis tells us that bargaining costs matter most in situations in which pairs of agents have frequent needs for mutual adaptation. (If many agents are involved, it can reasonably be argued that market discipline eliminates the scope for, and thus any cost of, bargaining.)

Considering the obvious absurdity of bosses negotiating payments for every order given, it is logical to ask whether bargaining costs are sub-additive, such that the parties can economize on bargaining costs by pooling several bargains into one. Maciejovsky and Wernerfelt (2011) experimentally address the dual issues of existence and sub-additivity of bargaining costs. Subjects are given the role of buyer or seller, paired up, and asked to bargain several times. In each bargain, the sellers' costs and buyers' values are random draws from commonly known distributions. The draws are common knowledge and at the end of the experiment subjects are paid, for all consummated trades, the difference between negotiated prices and own costs/values. The novel aspect of the experiment is that subjects, at any time, can make two kinds of offers; one applying to the current trade only, and one applying to all current and future trades. So the latter effectively pools the remaining bargains into one. Pooling is generally not costless because the rules specify that all bargains covered by a pooling agreement have to be consummated. As the supports of costs and values are partially overlapping, costs may exceed values in some bargains. These can be avoided if the subjects bargain on a trade by trade basis, but not if they pool. The article reports on six variations of the experiment. The results, and their consistent pattern across treatments, show that bargaining costs exist, matter, and are sub-additive in the experimental setting.

The experiment does not admit several frequently mentioned sources of bargaining costs. Subjects cannot expend any resources preparing to bargain, they have no opportunity to burn surplus with inefficient post-bargaining behavior, and there should be no distortions from incomplete information (all the treatments involve full information bargaining). This does not imply that the above types of bargaining costs do not exist; I believe that they do, but it suggests

that simply "not liking to spend ones time bargaining" is sufficiently important to show up in the data.

3. **THEORY OF THE FIRM**

Before describing the proposed theory, I would like to make some more general observations about its relationship to transaction-cost economics (TCE) and the property rights theory (PRT).

First, since firms are "common", in the sense that there are many of them, their existence should ideally be explained by some equally common factors. In particular, even though "hold-up" is an out-of-equilibrium phenomenon in both PRT and TCE, one wonders how widespread it is, and thus whether the threat of it can explain the multitude of firms in the economy. Bargaining frictions, in contrast, are ubiquitous.

Second, since we can imagine a wide variety of institutions, it would seem unlikely that two or more problems would have the same solutions, as when TCE portrays the firm as a response to any mixture of ex ante and ex post inefficiencies. In contrast, PRT focuses entirely on ex ante inefficiencies and I look at ex post inefficiencies.

Third, when thinking of the firm, it is possible to define its essence in terms of joint asset ownership or the employment relationship. TCE suggests that the two are driven by "substantially the same forces" (Williamson, 1975, p. 99) and PRT gives primacy to asset ownership with employment following by definition (Grossman and Hart, 1986). I will use employment relationship as the basis for the theory of the firm and show in a later Section that asset ownership is likely to co-vary.

Fourth, legal and governmental definitions of employment do not provide precise standards by which to judge a theory. These definitions are vague and imprecise – probably reflecting the lack of theoretical clarity in the area. A complementary, and possibly better, standard is given by "everyday language" use the terms "firm" and "employee". In the end, we probably cannot develop a theory that exactly rationalizes one of these standards. However, some theories will clearly come closer than others.

The primary source of inspiration for my theory of the firm is the literature on optimal trading mechanisms following Myerson and Satterthwaite (1983); combined with the powerful intuition that it would be massively inefficient for bosses to negotiate a new fee each time they issue a different instruction. To make this hold up to theoretical scrutiny, I need the positive and sub-additive bargaining costs discussed in Section 2.

The theory is developed in Wernerfelt (1997, 2012a). Both papers are focused sellers supplying services to buyers with changing needs. Consider first three bilateral mechanisms (as in Wernerfelt, 1997): Employment, Sequential Contracting, and Price Lists.[1]

In the Employment mechanism, the parties negotiate, on a once-and-for-all basis, a wage and a large set of services to be supplied on demand. Examples of services covered could be all the many things a secretary or a superintendent may be asked to do. Since a lot is covered by the agreement, the initial bargaining costs may be large, but in equilibrium, no further costs are incurred, while gains from trade are realized in every period. If one of the parties initiates a later re-negotiation of the wage, bargaining costs are incurred again and there is a corresponding loss of efficiency.

Under Sequential Contracting, a new price is negotiated whenever the buyer's needs change, and bargaining costs are incurred on each occasion. However, these bargains are simpler than those required for employment contracts; only a single, known service is involved and the overall stakes are lower. The per-occasion bargaining costs are thus lower.

With Price Lists, a set of prices are agreed upon ex ante and then referred to as needed. As in Sequential Contracting, the per-service bargaining costs are again fairly low. However, the mechanism is not efficient if the parties have to negotiate a very, very long price list. So the diversity of needs (how long a price list would have to be) plays an important role in the relative attractiveness of alternative mechanisms.

With sufficiently frequent needs for adaptation, the folk theorem allows us to assume that all trade is efficient in Employment and under Sequential Contracting, while the Price List is assumed to implement all efficient trades covered by the list.[2] This means that the only

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[1] These are named "Hierarchy", "Negotiation-as-needed", and "Price Lists", respectively, in Wernerfelt (1997). That paper also uses "communication costs" as the leading example of bargaining costs.
[2] The original version of this paper contained an explicit dynamic model with two-sided incomplete information along with a folk-theorem proving the limiting efficiency of ex post trade. Most of this formality was taken out of the reduced form version eventually published.

bargaining costs are those associated with the process itself – there are no trading inefficiencies. Given this, the performances of the three mechanisms only differ because of the different costs of adjusting to changes. In the Employment mechanism, these are the one-time costs of negotiating a wage-agreement, with Sequential Contracting, these are the per-change costs of agreeing on new prices, and in the Price List, and these are the one-time costs of negotiating the price list plus the loss of gains from trades not covered by the list. Since no mechanism can govern change with lower variable costs of adaptation than Employment (just a verbal instruction), there exists a region of the parameter space (with needs for frequent adaptation) in which it weakly dominates all other mechanisms in a very large space. In Figure 1 below, I have plotted the most efficient mechanisms in terms of the relative importance of frequent and diverse adaptation. Looking at the Figure, Price Lists are good when they can be kept relatively short, Sequential Contracting is good when change is infrequent, and Employment is good when frequent and diverse adaptations are needed.

Figure 1

Most Efficient Mechanisms 1

Importance of

diverse adaptation

Sequential Contracting   *Employment*

*Price List*

Importance of frequent adaptation
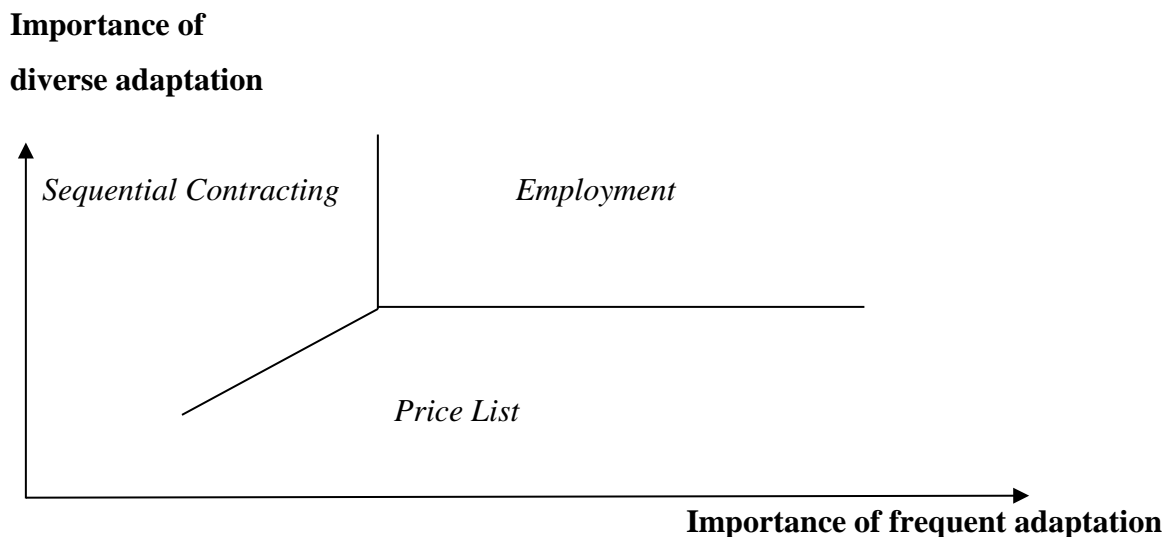
In order to bring large markets into the comparison, I add a second friction (bargaining costs being the first) and assume that a seller has to invest in a specific set-up cost to cover the costs of transportation, coordination, learning, and billing, each time he wants to serve a different

buyer. I also make the standard assumption that different sellers are good at different tasks. In this context, Wernerfelt (2012a) compares three mechanisms: Employment, Sequential Contracting, and Markets. To facilitate comparison, I again assume that trade is ex post efficient in all three mechanisms. So the Employment and Sequential Contracting mechanisms are exactly the same as in Wernerfelt (1997) discussed above. The performance of Employment is gains from trade every period minus the one-time costs of negotiating the employment contract, and the performance of Sequential Contracting is gains from trade minus bargaining costs every period. The newly introduced mechanism, the Market, is different because sellers can specialize in the services at which they are most efficient. For example, instead of being superintendents they can be plumbers, carpenters, or electricians. So while gains from trade are higher, the downside is that sellers have to incur specific set-up costs each time they change to serve a new buyer.[3] I show that there exist three regions in the parameter space in which each of these three mechanisms weakly dominates all others in a very large class. The relative performance depends on the frequency with which change is needed, the gains from specialization, the specific set-up costs, and bargaining costs. These are illustrated in Figures 2 and 3.

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[3]It is worth noting that this is not an argument about hold-up. What matters is the cost of the specific investment, not the extent to which it is made.

Figure 2

Most Efficient Mechanisms 2

Specific set-up costs

Sequential Contracting

Employment

Market

Importance of frequent adaptation
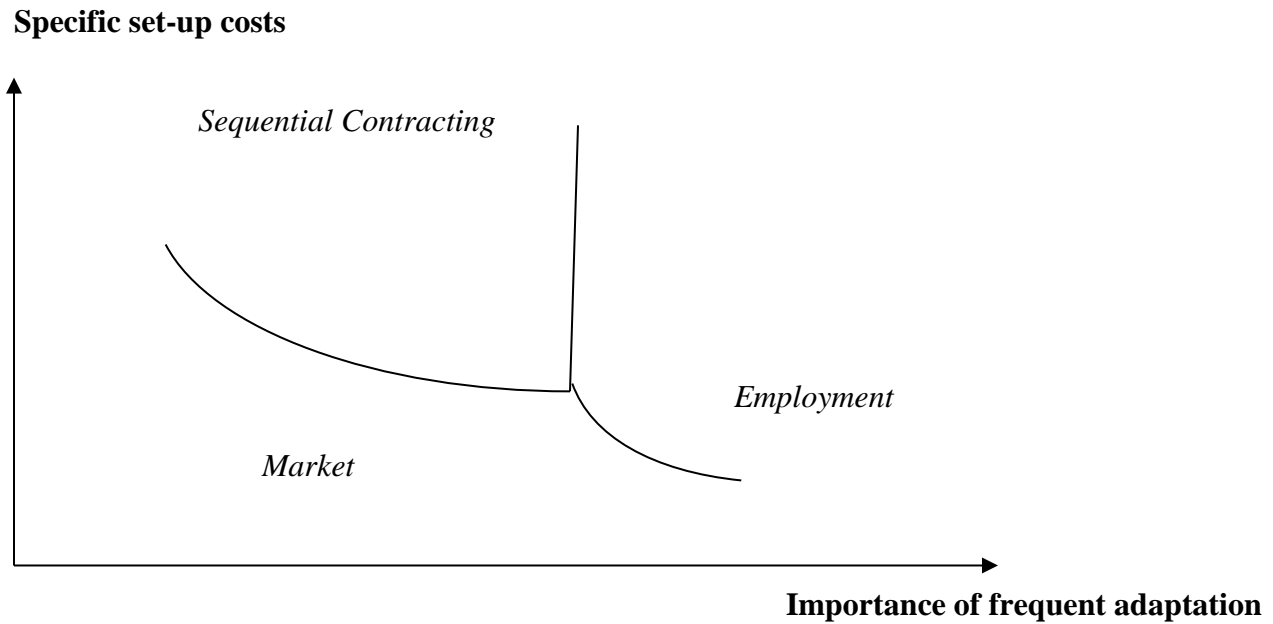
In Figure 2, Markets are good when specific set-up costs are low, Sequential Contracting is again good when needs change infrequently, and Employment is good when the cost advantages of specialists are small and needs change fast.

Figure 3 highlights another parameter, the gains from specialization. It shows that the Market is good when specialists are much more efficient than employees doing many different jobs.

Figure 3

Most Efficient Mechanisms 3

Gains from specialization

Market

Employment

Sequential Contracting

Importance of frequent adaptation
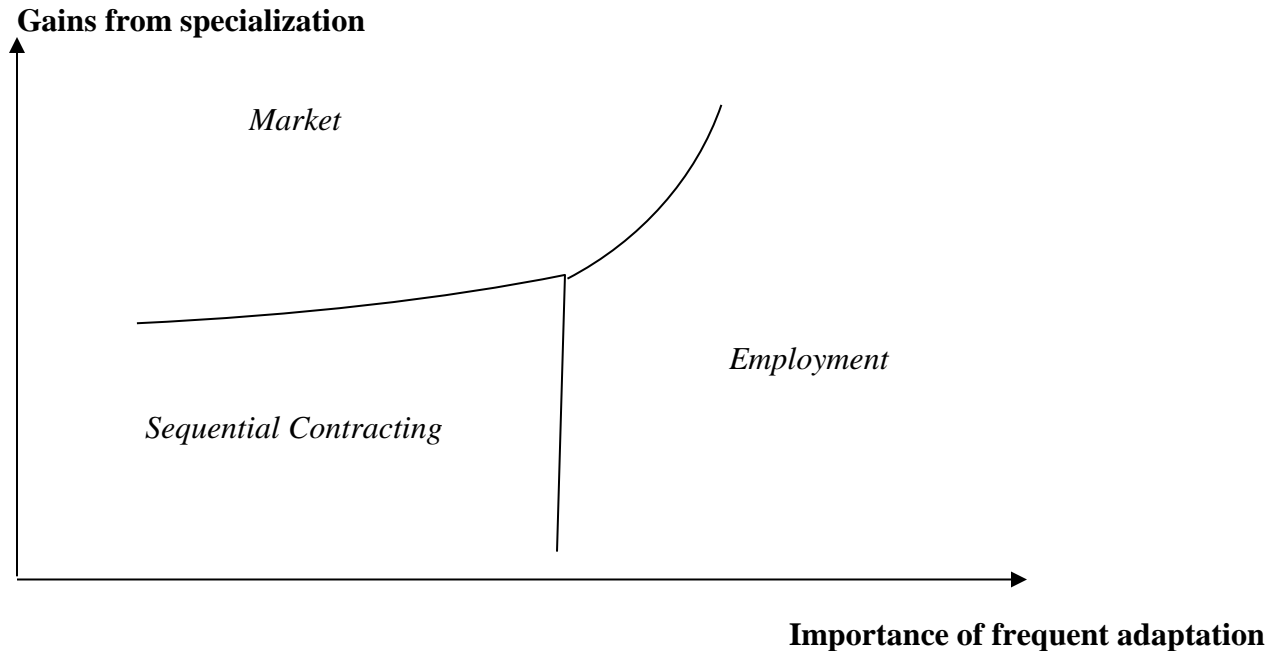
The central empirical prediction of the theory; that more frequent changes make Employment more attractive, is tested in Novak and Wernerfelt (2012). We use data from the automobile industry. While a car is made up of thousands of parts, the industry divides them into 36 "systems" (body in white", interior, etc.). These systems are interdependent to differing degrees and our hypothesis is that pairs of systems needing more frequent mutual adaptation are more likely to be designed and produced by a single firm. Interviews with a number of executives and experts in the global automobile market helped us produce a 36x36 matrix of these interdependencies. It turns out to be very hard to find the optimal structure of production (the number of possible solutions is on the order of the number of seconds since the big bang). However, the data suggests that the automotive industry does a very good job: pairs of systems needing more frequent mutual adjustment are much more likely to be housed in the same firm.

4. JUDGING THE THEORY AGAINST STYLIZED FACTS

Asset Ownership

Perhaps the central stylized fact to be faced by any theory of the firm is that the boss, the person being obeyed by the employee, generally owns the productive assets used by the latter. As its name suggests, the property rights theory (Grossman and Hart, 1986, Hart and Moore, 1990) has taken this stylized fact particularly seriously and in fact starts by analyzing who should own the assets and ends by defining that person as the boss. (So you are my boss if and only if I work with your assets.) While this represents a major advance over previous theories that more or less ignored the issue, there are cases in which employees own some assets – i. e. many craftsmen own their own tools. There are also cases in which employees appear to work with no assets at all. This then suggests that it is necessary to use two different theories to explain asset ownership and employment; although these theories still should be able to explain that the boss does own the assets in the vast majority of cases.

Since the theory of the firm described in the previous Section does not depend on assets at all, I have many degrees of freedom in pairing it with a theory of asset ownership, as long as the latter uses the boss vs. employee roles as a significant input. One such theory is described in Wernerfelt (2002). The idea is simply, that since the boss decides how an asset should be used, she should bear the consequences of these decisions. For example, if the boss asks that a machine be used on a task that puts a lot of wear and tear on it, it is normally desirable that she pays the resulting externality in the form of depreciation costs. An important exception is one in which actions of the asset user (the employee) are a more important determinant of depreciation. ("Is a carpenter using a chisel as hammer?") The theory depicts optimal ownership as striking a balance between the boss's incentives when deciding what the asset is used for, and the employee's incentives when deciding how to use the asset. It thus allows for cases in which the employee owns assets as well as for cases in which no assets are used.

We test and refine this theory in Simester and Wernerfelt (2005). Using questionnaire data on fifty carpenters and forty-one tools, we find that employee ownership is more likely when the tool is easily lost or stolen (events that are under the control of the operator) and less

likely when the boss's task assignment affects depreciation. Consistent with the idea that individual incentives for responsible use gets diluted when several employees use the same asset, we also find that shared-use assets are more likely to be owned by the boss. In contrast, we find no effect of asset specific human capital investments (although we cannot rule out that these play a role in other industries).

Low-powered Incentives

While the boss's ownership of assets is the strongest and most precisely measured stylized fact about the theory of the firm, another important stylized facts are that employees face weaker incentives than independent contractors (Williamson, 1985) This, and the extent to which it is consistent with my theory, are taken up in Wernerfelt (2004b).

To look at the steepness of incentives, I consider a principal-agent model in which the seller can exert different levels of effort resulting in more or less output. According to the theory, employees may be asked to perform a wide variety of tasks, each with a different relationship between effort and value. Since this introduces more noise in the effort-outcome relationship, it means, in the presence of risk-aversion, that the optimal contract for an unspecified task is less steep than that for a specified task. More precisely, I compare two contracting regimes in a principal-agent model. In the *ex ante* regime, meant to represent employment, the task is not known and parties have symmetric but noisy information about the effort-outcome relationship. Standard arguments then show that the optimal contract is less steep the larger the noise. In the *ex interim* regime, meant to represent sequential contracting, the task is known, and the parties have less noisy but asymmetric information about the effort-outcome relationship. This allows steeper incentives, but raises the possibility of inefficient bargaining breakdown. So the choice between employment and sequential contracting is portrayed as a tradeoff between low-powered incentives and bargaining costs.

Communication within and between firms

It is widely believed that there is more communication within than between firms (Bolton and Dewatripont, 1994; Simester and Knez, 2002). To contrast communication within and between firms, Wernerfelt (2008) considers a bilateral trading game in which the seller may

discover an improved, but possibly more costly, widget design. After the discovery phase, he offers one, and only one, design to the buyer. So if the seller has discovered the new design, he has the choice between offering it or the "old" design. I will think of him offering the new design as communicating about its discovery. In contrast, to find the new design but offer the old will be thought of as not communicating. In the *ex ante bargaining* mechanism, meant to represent Employment, the parties agree on a price before the seller learns about the existence, and if so the cost, of an improved design. In the *ex post bargaining* mechanism, meant to represent Sequential Contracting, the parties bargain after the seller has learned about the new design and had a chance to inform the buyer about its existence. In either case I assume that bargaining consists of the buyer making a take-it-or-leave-it offer. While the seller's costs for the two designs are his private information, it is possible for the buyer to make some inferences about these costs by inverting the seller's communication strategy. The key point is now that a proposal to trade the improved design allows the buyer to make some inferences about the relative costs of the old and the improved designs. A proposal to trade the old design may also reflect relative costs, but could just be driven by the seller not having found the improved design. So while "communication" – proposing the improved design – may allow the seller to share in a larger total surplus, it also reveals more information and allows the buyer to make a, for her, better TIOLI offer. Communication thus diminishes a player's bargaining power, and there is a less incentive to communicate under sequential contracting. This concern does not play a role in the employment relationship, where the wage has been settled on ex ante, making ex post bargaining power irrelevant. So consistent with stylized facts, we have less communication between and within the firm.

Delegation of decision rights

Since the role of bargaining costs in motivating submission to authority is central to my theory of the employment relationship, one could conjecture that it also plays a role in delegation of decision rights within the firm. I have investigated two further perspectives on this.

In Wernerfelt (2007a), I consider cases in which the delegating party can renegotiate a decision before it is implemented. In the presence of bargaining costs, contingent claims contracts are more expensive the more contingencies are covered. One way to avoid bargaining

over decisions in a contingency is to explicitly or tacitly give one party the right to decide. This is particularly attractive if the other party is relatively indifferent between the available options (Simon, 1951), if preferences are similar, and if the delegating player has comparatively poor information about the decision. However, even if both parties care a lot about the decision, delegation is possible as long as the delegating party retains the right to renegotiate/protest the decision. In the limit, if renegotiation is as cheap and as effective as bargaining, the parties can delegate everything. The threat of renegotiation may then discipline the decision-maker just enough that actual renegotiation becomes unnecessary, meaning that the parties do not even have to negotiate about the contingencies that do materialize. One should not think of this limit as interesting in itself – after all, it describes a case in which there was no reason to write a contract in the first place. The point is rather that players will want to delegate many contingencies even far away from the limit. So in this model, contracts can be incomplete because the threat of renegotiation makes it safe to leave them as such. The direction of causality in this argument is, of course, the opposite of that in the Property Rights literature in which incompleteness makes renegotiation feasible.

In (Wernerfelt, 2007b), I again use the machinery of protests and renegotiation to look at the case in which bargaining costs take the form of decision-making costs. As any manager will tell you, making good decisions is hard work. You need to collect information, think through scenarios, and dream up alternative ways of doing things. One advantage of delegation or ceding of decision rights is thus that the delegating player saves these costs. This makes it more attractive to give up decision rights and effectively agree to take orders.[4] The model considers a case in which a group of individuals have to make a single joint decision, but differ in their preferences as well as in the amount of information they have. If participation is costly, it is ex ante efficient to delegate the decision to a small committee whose members all have good information and jointly have average preferences. If, as in Wernerfelt (2007a), renegotiation/protests are possible, delegation becomes even more attractive and the optimal committee size smaller.

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[4] While my theory of the employment relationship does not make use of (depend on) this effect, nor on decision-making costs, it does make employee status more palatable. Plus, it is consistent with the stylized fact that managers make a large number of decisions per hour, or even per minute (Guest, 1956).

5. HETEROGENEOUS FIRMS AND THE RBV

Even though they often do not want it that way, firms are different; and according to the RBV, these differences play a large role in determining their strategies and behaviors. While these facts are readily accepted by management scholars, economists have had a harder time with them. The issue is that it has been very difficult to understand why imitation does not eliminate all important differences. The present Section links my theory of the firm to heterogeneity and ultimately the RBV in two steps. The first shows how small differences might emerge even if firms are ex ante identical, and the second uses the theory to show how small differences endogenously can turn into large differences.

In Wernerfelt (2004a) I look at a team in which wants to allocate a set of resources to those members for whom they are worth the most. Individual valuations are private information, but the members may communicate in "rounds", meaning that each member can send one binary message to a center in each round. A code can be represented as a sequence of nested bisections of the set of possible valuations. For example, if the values 1, 2, 3, and 4 are possible, one code could have "High" meaning "3 or 4" and "High, Low" meaning "3", while another code could have "high" meaning "2, 3, or 4", and "High, Low" meaning " 2 or 3". Members choose their codes individually, but all measure performance by the expected number of rounds needed to perfectly allocate the resources. A code is "linear" if when $x < y < z$ and it sends the same message for x and z, then it also sends that message for y. A set of codes are in equilibrium if no unilateral deviation gives the team higher payoff. The main results are that all equilibria are symmetric in the sense that all members use the same code, and that any linear code can be sustained in equilibrium as long as all members use it. Since linear codes differ in their efficiency, this means that I have multiple, more or less efficient equilibria. To the extent that equilibrium selection is random, this then suggests that ex ante identical teams can end up in different equilibria with very different efficiencies.[5]

To explore the implications of manufacturer heterogeneity, Wernerfelt (2012b) generalizes the theory of the firm discussed in Section 3 by adding a richer model of buyers, who

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[5] Also Wernerfelt (2003) shows how small initial differences can grow to become very large. The essential idea is that firms will invest in areas where they have a comparative advantage. A small heterogeneity in a segment will lead to more investment by the leading firm and less by its competitors, resulting in ever larger differences.

here should be thought of as manufacturers. As in the original model, there are a lot of possible services, and each seller can perform one unit of one service per period. There are gains from specialization because each seller can perform one particular task at lower cost than all others. To keep things simple, I assume that Markets and Employment relationships are the only two trading mechanisms.

The central difference between this and the original model is that buyers/manufacturers differ in how many services they need per period. In particular, some "big" manufacturers may almost certainly need one or more specific services in every period. This feature makes it possible to specialize as an employee. So laborers can be generalist Employees (superintendents), specialist Employees (plumbers working full time for big landlords) or specialists selling in Markets (independent plumbers). Specialist Employees are very efficient; they only perform the service they are best at and they do not have to pay specific set-up costs. Reflecting this, I find, under reasonable assumptions, that the most efficient sellers become specialist Employees, while the least efficient sellers become generalist Employees. (I also find that Markets are used for services with greater gains from specialization and less aggregate demand.)

The most interesting effect, at least for the present purposes, appears if I assume that manufacturers can decide how many services they will need. In this case, manufacturers will prefer services that can be performed at lower cost, and the advantages of specialization will drive fractional needs out to the extent possible, such that manufacturers can hire specialist Employees. For example, starting from a position in which she needs a plumber 75% of the time, a manufacturer will expand her business to the point where the plumber can specialize.[6] In other words, manufacturers will focus on what the already are good at in order to leverage that and become even more efficient. This idea, running and expanding the firm to leverage excess capacity of productive resources, is of course one of the central tenets of the RBV, and includes as a special case Penrose's growth from excess capacity of managerial resources.

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[6] Or, similarly, the manufacturer will expand if she is close to the point at which a specialist plumber can be hired.

6. **DISCUSSION**

The theory sketched in this paper offers an answer to fundamental questions in the study of business and can at the same time serve as a micro-foundation for the RBV. We normally think of more complex resources than the plumbers used in the above toy-example, but the same argument goes through in more realistic cases involving teams of employees with complementary skills. In fact, the theory will tend to predict that firms grow very large. Once a manufacturer has expanded enough to utilize all her capacity of one type of specialist, she may find herself tempted to expand further to utilize a specialist in another area, etc, etc. If we make the realistic assumption that tasks are complements, this growth process can snowball very fast.

The theory is still incomplete when it comes to the scope of the firm. As noted above, it is not hard to use it to justify expansion and diversification. The problem is that the only break on expansion is that more employment contracts have to be negotiated. (In the extreme case in which expansion happens by merger, only one more employment contract is needed.) Although this is reasonable when the firms are small, it does not make sense for two large firms.[7]

There are several possible ways to address this issue. The simplest and most reasonable might be to start with the models of delegation discussed in Section 4, while another may be to look into the loss of strategic focus as the firm becomes larger and more diverse. I have, however, not yet looked into any of these possibilities.

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[7] Since the same weakness plagues other formalized theories of the firm as well (in the property rights theory, the analog cost is that one more player has bad incentives), the problem is that very simple models miss some forces that only kick in once firms are sufficiently large.

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