Specialization and the Transaction Cost Theories of the Firm

The Role of Specialization in Transaction Cost Analyses of Economic Organizing

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The dominant approach to analyzing governance and organizational issues in economics is based on Ronald Coase's pioneering insight that there exists in the market a "cost of using the price mechanism" (1937, p. 390). Coase (1960) further argued that in an imaginary world where these transaction costs are zero, all gains from trade would necessarily be exhausted, independent of form of organizing and initial allocation of property rights. In the real, positive-transaction cost world, however, transaction costs should explain actors' choice of governance structures, primarily the so-called make-or-buy decision between vertical integration in authority-based hierarchical firms and market contracting (Walker and Weber 1984; Klein 2005; see e.g., González-Díaz and Vázquez 2008).

Building on Coase's insight that transaction costs in the market drive choice of governance structures and consequently integration in firms, Oliver Williamson (1975; 1985; 1996c) further developed the transaction cost approach. The Williamsonian framework, known as Transaction Cost Economics (TCE), is based on Coase's original insight that there are transaction costs in the market, and the Coasean view of the market and the firm, and hypothesizes "that the main purpose and effect of economic organization [is] to economize on transaction costs" (Williamson 1996b, p. 133). Whereas this premise is undoubtedly consistent with Coase's transaction cost view, there are well-known points of disagreement. Arguably most widely known and important, Coase disagrees (see e.g. 2006) with the great importance Williamson and other TCE scholars place on asset specificity as a principal cause of transaction costs (see e.g., Williamson 1993; Klein 2010).[1]

The points of disagreement aside, the Coasean and Williamsonian approaches to transaction cost analysis are mostly treated as a consistent framework for the study of economic organization (see e.g. Winter 1988). As claimed by Madhok, there may be differences in *emphasis* in Coase's and Williamson's work, but both scholars "saw firms and markets as alternate means of coordination, the firm being characterized by coordination through authority relations and the market being characterized by coordination through the price mechanism" (Madhok 2002, p. 536). In addition, both Coase and Williamson identify transaction costs as the *explanans* for integration of transactions in firms.

[1] This difference between the Coasean and Williamsonian views plays a central role in the long-lived GM-Fisher Body debate between Ronald Coase and Benjamin Klein, see (see Klein, Crawford and Alchian 1978; Klein 1988; 1996; Coase 2000; Klein 2000; Coase 2006; Klein 2007).

As commonly claimed by Williamson (see e.g., 1981; 1998; 2002b; 2005), the TCE framework builds directly on fundamental Coasean acumens and is largely to be considered a further development of the Coasean theory of organization. Furthermore, the Coasean view of the firm as an authority-based hierarchy distinct from market trade or contracting is shared by Williamson, to whom "the firm possesses a comparatively efficient conflict resolution machinery… fiat is frequently a more efficient way to settle minor conflicts" (1971, p. 114). Indeed, Williamson's "hierarchy" is explicated as a formalized version of the Coasean firm.

While there are presently numerous scholars utilizing the transaction cost framework for the study of organizing and governance, the approach was originally developed by Coase (1937; 1960) and Williamson (1975; 1985; 1996c), who are therefore often considered most important (and influential) in the field (see e.g. Madhok 2002).[2] The transaction cost approach as a whole, since it is based on the work of Coase and Williamson, should therefore have a common Coase-Williamson core of assumptions regarding the workings of the market and what constitutes a firm. This core should boil down to a set of fundamental assumptions that are compatible with each other and consistent with the expounded transaction cost theory of organization.

This paper investigates the underlying assumptions in the transaction cost analysis of organizing in order to determine the accuracy of this commonly made (but never substantiated) claim that the works of Coase and Williamson constitute a coherent transaction cost approach. I focus on the original work of the two scholars and attempt to identify the nature and implications of their core assumptions and theoretical constructs. The objective is to evaluate and assess the veracity of the assumed compatibility between Coase's and Williamson's views of the market and the firm through argument for the contrary: that there are in fact fundamental differences between Coase's transaction cost perspective and Williamson's TCE. Indeed, I show that Coase and Williamson have different points of departure in their respective analyses; they espouse different and discordant views of what constitutes the market and what is the nature of firm organizing, and, consequently, their theoretical frameworks should be deemed ultimately incommensurable.

The conclusion of the argument provided in this paper could have serious implications for research utilizing the transaction cost approach as well as for the further development of TCE as a framework for studying governance choice. If the theoretical frameworks of Coase and Williamson are incompatible and therefore must be treated as theoretical substitutes rather than complements, then this calls for further research to identify clearly the implications as well as comparing and contrasting the theoretical paradigms. Furthermore, these conclusions may offer a new perspective on previous empirical research and can provide new illuminating interpretations of findings.

The next sections discuss the underlying assumptions about the workings of the market in Coase's and Williamson's respective views. I argue that both scholars implicitly rely on extensive specialization in their respective understandings of the market: Coase as a necessary and

[2] Both Coase and Williamson have received Nobel Prizes for their work on transaction costs, organization, and governance in the market: in 1991 and 2009, respectively.

sufficient precondition for trade, and Williamson as a major cause of costs inhibiting market transactions. I furthermore identify that their respective views of the firm in the market suggest that the internal structure of the firm must be different in the Coasean and Williamsonian frameworks, and therefore that there seems to be two different views of the firm in the transaction cost-based analysis. I conclude by drafting a possible framework for further study that is consistent with the identifications made in this paper as well as with a modern view of the market and the firm.

COASE'S MARKET AND TRANSACTION COSTS

Ronald Coase famously identified an adamant disparity between economic theory and practice: that there is no place for firms in economic theory while in real life transactions tend to mostly take place within or between firms. This means economic theory "gives a very incomplete picture of our economic system" (1937, p. 387), which suggests that there are additional forces that drive organizing but that are yet to be recognized by economic theory. Based on this identification, he formulated the so-called Coasean questions that remain "at the heart of the research agenda on economic organization: 'Why is there any [internal] organization?' and 'Why is not all production carried on by one big firm?'" (Williamson and Winter 1991, p. 4).

Coase's work is undoubtedly a significant contribution to the study of industrial organization and how firms are viewed in economics, but while it provided pioneering insights, "The Nature of the Firm" (1937) was not created in a vacuum. It should probably be seen as the culmination of a decade and a half of voluminous research on organizational issues in general and on vertical and horizontal integration in particular (see e.g. Coase 1972, p. 62). Coase explicitly acknowledges Arnold Plant as having the "greatest influence" on his thinking, and mentions especially how he from Plant learned that "producers maximize profits, that producers compete, and therefore that prices tend to equal costs and the composition of output to be that which consumers value most highly" (Coase 1988b, p. 7). But there were other major influences on Coase's thinking, especially as relates to industrial organization. As argued by Jacobsen (2008), the work on firm organizing and size by Austin Robinson (1931) had great impact on Coase's thinking, as did the works of Alfred Marshall (1890) and D. H. Robertson (1923).

Interestingly, while relying on and incorporating parts of Robinson's reasoning, such as the theorizing on optimum firm size, Coase pays no attention to the former's elaborate discussion on the division of labor within firms (Robinson 1931; Smith [1776] 1976) while explicitly rejecting Usher's (1920) and Dobb's (1928) use of the division of labor to explain the existence and structure of firms (1937, p. 398). Contrarily, Coase sees a problem with the market's division of labor, which is said to rely on the price mechanism as sole and efficient organizer and coordinator of production processes. He identifies that there are costs of "carry[ing] out a market transaction"[3] (1960, p. 15) that inhibit market organizing and provide cost advantages for organizing by fiat within firms.

[3] Coase specifies transaction costs as costs incurred "to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up

Transaction costs hereby suggest that the efficient coordination in the market through the price mechanism, a system that ultimately "works itself," may be subject to an upper limit. Lazonick (1991, pp. 168-171) interprets this limitation as a type of market failure, yet Coase seems to argue that the limit on market organizing imposed by transaction costs is not a failure in allocation but simply a cost disadvantage. Coase's argument is here somewhat peculiar. He seems to claim that the price mechanism is universally unrivaled in terms of efficiency in resource allocation, but that in certain situations the costs of carrying out a transaction – the transaction costs – may be very high. Therefore, an entrepreneur can avoid unnecessary overhead of market transactions and gain competitive advantage through relying on direction as a means to coordinate resources.[4] The firm, consequently, provides a means to more cheaply coordinate production processes that can also be coordinated using the price mechanism. The object of organization and the aim for the entrepreneur is hence "to reproduce distribution of factors under atomistic competition within the business unit" (Coase 1988b, p. 4).[5]

As we have seen, Coase stresses that what distinguishes intra-firm from extra-firm transactions is the former's, unlike the latter, allocation of resources not being directly dependent of the price mechanism. Firms are based on an entrepreneur-coordinator (manager) directing resources, which ultimately makes them planned "islands of conscious power" (Robertson 1923, p. 85; quoted in Coase 1937, p. 388). (1937, p. 393). The entrepreneur's power or authority is essential to how Coase defines the firm, but can be seen as a direct effect of employment contracts being open-ended and replacing a multitude of limited and specific market contracts (Coase 1937, pp. 391, 392, 403-404; 1988a, p. 30; cf. Simon 1957, p. 184).

Entrepreneurial authority to direct factors suggest a shortcut to bring about sufficiently efficient allocation of resources without going through market interfaces. Through integrating production processes and thereby superseding the price mechanism, the firm can avoid the "inconvenience" (and therefore cost) of "every transaction involving the use of another's labour, materials or money [being] the subject of a market transaction" (Coase 1988b, p. 4). In other

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the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on" (1960, p. 15).

[4] It is obvious that the entrepreneur would have to first rely on the price mechanism in order to find factors to coordinate within the firm. Therefore, he or she would initially be subject to the market's transaction costs and can consequently avoid them only when the firm already exists, a situation which could presumably only be brought about at further cost. This process of establishing the firm, i.e. how firms emerge over time, is, however, not analyzed in Coase (1937).

[5] Coase is not explicit on how the market's allocative resource efficiency relates to transaction costs. The two concepts are treated as distinct where the market price mechanism's allocation is assumed efficient but an entrepreneur, reproducing such allocation through *in*directly relying on the price mechanism, may do it at lower cost (1937; 1988b). In a situation where the bringing about of transactions that utilize this allocation (using the price mechanism) are laden with excessive transaction costs, direction within a firm is less costly than finding and "haggling" with factor owners, which implies that the entrepreneur may have a cost advantage. This treatment of efficiency and cost as separate seems to contradict the Coasean view of cost expressed in an article series published in 1938 in *The Accountant* (Coase 1938a; 1938b; 1938c; 1938d; 1938f; 1938g; 1938h; 1938i; 1938e; 1938j; 1938k; 1938l). Here, Coase clearly accepts and advocates opportunity cost as the only practically and theoretically valid cost concept: "[t]he cost of doing anything consists of the receipts which could have been obtained if that particular decision had not been taken" (1938d, p. 560). It is therefore peculiar that the concept of allocative efficiency does not include an entrepreneur's transaction costs, which would necessarily affect the outcome of any chosen action.

words, the price system's efficient allocation of resources can, under ideal circumstances, be reproduced by the firm's manager, while significantly reducing the costs of production through mostly or altogether avoiding the "cost of using the price mechanism."[6] Herein lies the firm's *raison d'être*.

While the Coasean firm as hierarchical organizing suggests cost savings through supersession of the price mechanism, it is at the same time burdened with an inherent inability to outperform the market in terms of efficient allocation. This is an ambiguous statement, since efficiency (in allocation) should imply an optimum in terms of opportunity cost and therefore already include these costs of carrying out a transaction. Yet to Coase, the two seem to be separate concepts that are applicable on different levels: allocative efficiency seems to be a measure of overall optimal allocation of resources in the market, while transaction costs are primarily incurred for a specific transaction and so may affect individual entrepreneurs differently and, therefore, unevenly throughout the market. This suggests that a firm, in order to be profitable, need to be superior in organizing the transaction both to competing firms, which may suffer from locally different transaction costs, and to market organizing in locations where transaction costs are relatively low.

This seems to be what Coase has in mind when discussing the boundary of the firm as being decided by the relative costs of organizing. Writes Coase (1937, p. 394): "Naturally, a point must be reached where the costs of organising an extra transaction within the firm are equal to the costs involved in carrying out the transaction in the open market, or, to the costs of organising by another entrepreneur." The boundaries of the firm are set where the firm's costs are approximately equal to the costs of market transacting. They are not necessarily noticeable as "hard and fast line[s]" (Coase 1937, p. 392 fn 1; 1988a, p. 28), since the boundary of the firm depends on the market's transaction costs as well as the costs of the firm, the costs of competing firms, and the degree to which the firm and its competitors are able to reproduce (or come close to) the price mechanism's efficient allocation of resources.[7] There should thus be a natural limit to how many transactions can be organized within the firm; this point may be reached sooner than simple cost comparisons predict, since the firm is bound to experience decreasing returns to its management function while there is also an imminent, and most likely increasing, risk of the manager failing to sufficiently reproduce the market's efficient allocation of resources within the firm (Coase 1937, pp. 394-395).

Consequently, the entrepreneur in the firm struggles not only with attempting to reproduce market allocation of resources, but also to overcome the limits to his ability to manage mul-

[6] Williamson interprets Coase as saying a firm can easily reproduce market allocation of resources, suggesting there is essentially unproblematic for firms to be efficient. States Williamson (1991b, p. 165; emphasis added): "By *merely* replicating the market, the firm can do no worse than the market. And if the firm can intervene selectively (namely, intervene always but only when expected net gains can be projected), then the firm will sometimes do better. Taken together, the firm will do at least as well as, and will sometimes do better than, the market." The problem, to Williamson, is the impossibility of selective intervention.

[7] Most of Coase's analysis in "The Nature of the Firm" (1937) seems to assume that the entrepreneur is somehow endowed with the ability to achieve the object of organization, i.e. "to reproduce distribution of factors under atomistic competition within the business unit" (Coase 1988b, p. 4).

tiple transactions effectively. The former aim is facilitated by using the market prices that coordinate transactions carried out outside of the firm, a detail that indirectly suggests a global maximum to the size of a single firm: a manager can only achieve efficient allocation of resources as long as there exists a market benchmark to reproduce (cf. Rothbard [1962] 2004, p. 613). The firm is, in this respect, indirectly dependent on the market's price system for its survival; it must, in the words of Robbins (1932, p. 71; quoted in Coase, 1937, p. 389), be "related to an outside network of related prices and costs," without which the entrepreneur is blind and unable to efficiently allocate resources (Mises 1920; 1922).

Coase assumes, along the lines of Plant's teaching, that all transactions take place in a specialized market that offers individuals high-powered incentives (cf. Williamson 1985, ch. 6; 1988) to engage in trade for profit through directly linking individual performance and pay. The price mechanism, through which market actors are guided toward profit opportunities, ensures that the resulting allocation of resources is overall efficient. Therefore, the gains from trade should increase as the division of labor increases and, as a result, Adam Smith's ([1776] 1976) famous "invisible hand" becomes ever more forceful.

The firm (or business unit) is assumed to be sufficiently specialized to engage in trade in this type of specialized market, but to Coase this "need imply no specialization *within* the business unit" (1988b, p. 4; emphasis added). This follows from the view, in contrast to that of Usher, Dobb, and Robinson, that firms can do no better than perfectly reproduce the price mechanism's allocation of resources, however at lower [transaction] cost; it follows that any further specialization within the business unit would only imply structural/allocative inefficiency. The market is efficient, but the existence of transaction costs makes it costly to bring about the definitive market structure. Therefore, states Coase (1937, p. 395),

> a firm will tend to expand until the costs of organising an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange in the open market or the costs of organising in another firm. But if the firm stops its expansion at a point below the costs of marketing in the open market and at a point equal to the costs of organising in another firm, in most cases (excluding the case of "combination"), this will imply that there is a market transaction between these two producers, each of whom could organise it at less than the actual marketing costs.

The Coasean organization problem seeks an optimum in the tradeoff between benefits and costs of either organizing in the market or in business firms. In the former case, production benefits from the specialized market's efficient allocation of resources (+) but is restrained to the extent the [transaction] costs "of discovering what the relevant prices are" (1937, p. 390; cf. Hayek 1937; Hayek 1945) are high (-). In the latter case, the firm's means of resource allocation through low-cost direction (+) is potentially held back by organizing costs and, to the degree the entrepreneur's ability to reproduce efficient resource allocation is imperfect, costs of suboptimal

or only-close-to-efficient allocation and decreasing returns to management (-). Since direction is introduced ultimately to save on transaction costs, it follows that the optimization problem need only take into account the market transaction costs, the costs of discovering relevant prices, and the costs of possible failure to perfectly reproduce market allocation. The boundaries of the firm are set on the margin through comparing these costs of using the price mechanism and the costs of organizing in firms.

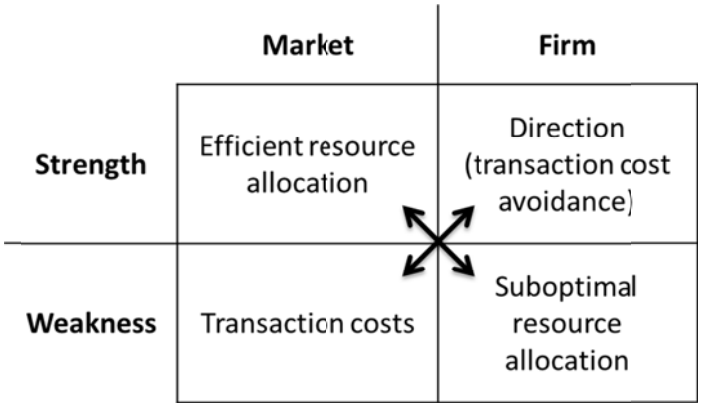

Figure 1. Summary of strengths and weaknesses for organizing alternatives in the Coasean theoretical framework

Coase argues that it may be the case that a firm organizer "may get factors of production at a lower price than the market transactions" since "it is always possible to revert to the open market" if this were not the case (presumably because factors are not laden with transaction-related costs) (1937, p. 392). Again, this suggests that there should be no significant difference between the production processes (the transaction's productive implementation structure) established in the market and those organized within firms. Rather, it seems Coase share's Marshall's (1890) view that, in Loasby's interpretation, "firms are like markets" or its "mirror image" (1990, p. 120). However, in Coase's view where the costs for market organizing of certain transactions tend to be higher than for other (dissimilar) transactions, we may expect to see certain types of transactions primarily organized within firms while other types are primarily organized through market contracting.[8]

It is furthermore suggested in Coase's analysis that firms organizing transactions of the same kind would internally be structured in a similar manner. What constitutes a firm, writes Coase, is that it "consists of the system of relationships which comes into existence when the direction of resources is dependent on an entrepreneur" (1937, p. 393). The role of the Coasean entrepreneur is limited to management; it would not be possible to "always" be able to disassem-

[8] As we saw in the discussion above, it seems transaction costs can also be different in different locations and depending on e.g. the entrepreneur's position in the market structure or network (cf. Granovetter 1973; 1983; 2005; Burt [1992] 1995), and consequently his or her access to knowledge of relevant market prices, so that transaction costs in certain places and for certain entrepreneurs may be different.

ble the firm to take advantage of market coordination when relative costs change if the entrepreneur were an innovator of new combinations or production processes (cf. Schumpeter [1911] 1934). This suggests that not only is the organizing structures of transactions within a firm similar to market organizing of alike transactions, but firms internally coordinating the same types of transactions should do so in similar ways. The degree to which firms are different should therefore depend primarily on the management function's ability (or lack thereof) to reproduce the price mechanism's [efficient] allocation of resources. It may also be possible that structural differences between firms may arise due to scarcity in or insufficient availability of such specialized (heterogeneous) factors that are utilized to carry out the transactions within the respective firms (Barney 1991; Lachmann [1956] 1978).

Thus we have that firm existence is dependent on the value of integrated organization as stated by the condition:

$$TC - (A_e - A_s) \geq 0 \tag{1}$$

where *TC* denotes the transaction costs of price mechanism coordination that are avoided by the firm through reliance on entrepreneurial direction (the cost benefits of integration), A_e is the value of efficient market allocation, and A_s is the (lesser) value of suboptimal firm allocation through direction. The term $(A_e - A_s)$ represents the loss of value due to suboptimal allocation of resources, primarily due to the limits of managerial ability, and we assume with Coase that $A_e \geq A_s$ for all entrepreneurs *e*.

If follows that the value of integrating a transaction within a firm, and thus allocating resources through entrepreneurial direction, can be stated as $A_s \geq A_e - TC$. Hence, economic justification for firm organizing of the specific transaction is dependent on managerial ability as well as transaction costs. The condition assumes that transaction costs in the market are strictly positive (Coase 1960), while firm organizing requires that *TC* is of sufficient magnitude to at least equal the relative loss (if any) due to intra-firm suboptimal allocation of resources. From this condition follows also that firms should not normally be equally efficient as markets, since $A_e = A_s$ implies that $TC = 0$. Consequently, wherever there are firms in the positive-transaction costs world they should be inferior to markets in terms of resource allocation efficiency. This consequence seems to confirm Coase's (1960) view that organization is irrelevant in a zero-transaction cost world.

The above condition (1) is however subject to constraints attributable to competing firms and therefore the ability of other entrepreneurs to reproduce efficient allocation of resources. In a highly competitive market situation, we must assume that A_s for an individual entrepreneur *e* is at least the magnitude of that of other entrepreneurs (-*e*). Coase's analysis furthermore suggests that transaction costs may be different in different locations as well as for different actors. We therefore have a situation where *TC* is not a constant across firms, but may be different just like the returns to management should depend on the individual entrepreneur's idiosyncratic abilities.

The condition for the firm is therefore:

$$TC_e - (A_e - A_{s,e}) \geq \max\left\{TC_{-e} - \left(A_e - A_{s,-e}\right)\right\} > 0 \quad (2)$$

where the weak condition (≥) between the focal firm and competing firms should be a strong condition (>) for any firm that is benefitting from a (sustained) competitive advantage (Porter 1985; Barney 1986; 1999). A competitive advantage exists where A_s is maintained at a very high level such that $A_s \rightarrow A_e$ or $A_s \approx A_e$. The term to which the value of the focal firm is compared need not be existing firms, but can be also *potential* competitors that the focal firm will have to relate to in terms of productivity in order to achieve or maintain profitability. A long-term successful firm would need characteristics similar to that of a monopolist, since long-term profitability should depend on the focal firm management's superior ability as compared to both existing competitors, possible competing firms to be established in the future, as well as market (price mechanism) coordination.

The latter, i.e., the zero to which we compare the value of firm coordination, is the value which we expect would be created under atomistic competition,[9] i.e. under efficient market allocation of factors. It is important to mention that it is relative to the present market situation, as are the concepts of transaction costs and allocative efficiency. Coase notes that "[i]nventions which tend to bring factors of production nearer together, by lessening spatial distribution" (1937, p. 397) affect the costs of coordination – "both the costs of organising and the costs of using the price mechanism" (1937, p. 397 fn. 3). Whereas his focus is specifically on the effects on the firm, where anything leading to improved managerial technique allows for larger firms, it is impossible to say if the effect of inventions in the market is greater on coordination in the market or within the firm. In other words, inventions offering improvements in communication technology and, consequently, a means for more effective coordination of production processes, is expected to reduce the costs in the market (TC) as well as the costs within the firm ($A_e - A_s$) through increasing the value of A_s (A_e is the optimal efficiency which is determined exogenously to the firm and assumed constant). In order for firms to increase (decrease) in size in terms of the number of integrated transactions as an effect of inventions and technological change we must have that $\Delta TC < \Delta A_s$ ($\Delta TC > \Delta A_s$) where the change in TC and A_s is always of the same sign.

For the individual firm, however, the transaction costs are given (but perhaps changing over time) and exogenous, which suggests that the productivity of the coordination and allocation of resources within the firm is determined solely by the effectiveness of the manager in attempting to reproduce market allocation. In other words, the Coasean firm is only as effective as

[9] Zero here denotes the universal condition for firm existence, which is here assumed to be market coordination of the production process. Equation (2) can easily be expanded through including a necessary condition that all firms in a certain market to exist must provide more value than any market organizing of transactions where relative costs are of different magnitudes (i.e., where market organizing is feasible). Such a constraint must also include e.g. transportation costs of market-produced items necessary to facilitate competition with the focal firm(s). This complicates the model while the value added to our analysis of the firm is negligible, since all competing firms everywhere would be subject to the same constraint and our task is not to theorize on transportation and advertising costs but to discover and explicate the underlying assumptions in Coase's view of the firm through formalization.

the ability of the manager, which is why Coase explicitly analyzes the managerial function. The structural conditions of the Coasean firm vis-à-vis the market suggests that management of the firm is primarily reactive and the firm's success is dependent on how swiftly and accurately its manager can reproduce the outcome of the price mechanism. "Management proper," Coase (1937, p. 405) concludes, "merely reacts to price changes, rearranging the factors of production under its control."

The value of the firm is still dependent on the exogenously determined transaction costs to which the integrated transactions are subject without directed coordination. As discussed above, these transaction costs may be different in different locations and, furthermore, to different entrepreneurs. The relative position of the entrepreneur (and, consequently, the firm) should therefore be an important determinant, however strictly exogenous and hence impossible to alter, of how successful a firm can become.[10]

This reasoning, as implied in Coase (1937), provides an important clue to the Coasean view of what constitutes and is the nature of transaction costs. Inventions – exogenous shocks to the market system – can increase the density of factors through overcoming or lessening the negative effect of "spatial" distances, which reduces transaction costs. As factors are perceived as closer and more readily available, frictions in the market subside and it becomes easier to discover what the relevant prices are. In other words, as the perceived density of the market increases, the limits of the market appear more distant (Bylund 2011). This overall makes market organizing more beneficial through lowering its costs, and therefore decreases the cost advantage for the type of organizing that is inferior in terms of allocative efficiency: the firm.

Whereas Coase shows that the effect of inventions on integration is ambiguous, he exemplifies only with the type of invention that decreases both transaction and organizing costs, and therefore makes both market and integrated organizing more appealing. As we have seen, however, this applies primarily to inventions that bring factors closer together and increases market density, which suggests that there could be inventions with the opposite effect. Indeed, inventions that increase specialization and therefore necessarily extend the length of production processes through breaking up tasks into more numerous, narrowly defined tasks may have an increasing effect on perceived distances and make the limits of the market more significant.

But the result of breaking up a task in several more narrowly defined tasks appears ambiguous. The cost of discovering relevant prices for factors performing more narrowly defined tasks may be higher *if we assume a certain dispersion of these factors*. The employment of such factors, with high complementarity and low substitutability (Lachmann [1956] 1978), suggest very high transaction costs if widely distributed (scattered) and infrequently occurring. But where such factors are not scattered, transaction costs would remain relatively low, since knowledge of factors available in the vicinity should be higher ceteris paribus than knowledge of factors at greater distances. It furthermore seems probable that the breaking up of tasks should

[10] This view of transaction costs as being relative to the position of the entrepreneur raises interesting questions of the importance of knowledge and information in vertical integration. While such an analysis is outside the scope of this paper, others have contributed to a knowledge-based understanding of the firm. (See e.g., Foss 1996a; 1996b; Nickerson and Zenger 2004; Sautet 2000)

imply that the more highly specialized factors that are created would tend to stay together. It is unlikely that they would attempt to occupy locations at greater distances from each other, since this would primarily increase their own transaction costs due to possible incompatibility with other factors in the market.

Based on the discussion above, we can conclude that Coase's concept of transaction costs should vary in the market and that the specific transaction costs for a particular transaction depend on the spatial distance between factors as well as the position of and the information available on where to find those factors. Moreover, transaction costs inhibit the effectiveness of efficient market organizing through levying costs on coordinating transactions, which could make coordination by fiat less costly. Transaction costs exist in the market only to the extent that factors are heterogeneous and therefore have a certain degree of complementarity combined with limited substitutability, which necessitate that [costly] measures are taken to discover relevant factor prices. The viability of establishing and maintaining integrated transactions within a firm is dependent not only on transaction costs, but on the combination of transaction costs being sufficiently high and a manager's (an entrepreneur's) ability to sufficiently reproduce the price mechanism's efficient allocation of resources.

It follows that where transaction costs are very high, managerial ability may be of lesser importance (ceteris paribus). Firms are organized around entrepreneurs and compete primarily through their integrated managerial function, which more or less effectively "reacts to price changes, rearranging the factors of production under its control" (Coase 1937, p. 405). The value of firm organizing lies, in addition to transaction cost avoidance, in the degree to which it reproduces efficient allocation, which suggests that the successful firm's internal structure should be similar to market allocation of factors. It should furthermore be the case that competing firms are similarly organized.

THE MARKET AND TRANSACTION COSTS ACCORDING TO WILLIAMSON

Williamson offers a more formalized and operationalized analysis of transaction costs and their effect on economic organizing seen as a "problem of contracting" (Williamson 1985, p. 20). Rather than focusing on explaining why there are firms in the market (as is Coase's primary objective), Williamson's framework attempts to explain the broader issue of governance *choice* (the firm, or vertical integration, being one of several alternatives) through discrete structural analysis (Williamson 1991a).[11] Using the transaction as the fundamental unit of analysis (Williamson 1985, p. 18; see also Commons 1934), the problem of economic organizing is seen as an effort to "align transactions, which differ in their attributes, with governance structures, which differ in their costs and competencies, in a discriminating (mainly, transaction cost economizing) way"

[11] In addition to market and firm, TCE identifies "hybrid" forms of organizing (Ménard 2004; 2010). These cover "a continuum … between spot markets and the command-and-control hierarchical firm" (Ménard 2010, p. 181) and all hybrid forms "attempt to achieve some level of central coordination and protection for specific investments while retaining the high-powered incentives of market relations" (Klein 2005, p. 438). Whereas the hybrid is an important concept in transaction governance analysis, it falls outside the scope of our discussion since we attempt to compare and contrast the views of Coase and Williamson on transaction costs and vertical integration.

(Williamson 1991c, p. 79). As such, TCE provides a framework for comparative institutional analysis through which governance choice is a result of actors' efforts to economize on transaction costs. The research agenda focuses on studying situations where transaction costs are significant, since "if transaction costs are negligible, the organization of economic activity is irrelevant" (Williamson 1979, p. 234; cf. Coase 1960).

TCE characterizes transactions along three "critical dimensions": uncertainty, frequency, and asset specificity (Williamson 1979, p. 239). Uncertainty follows from the fact that actors do not enjoy perfect knowledge and cannot perfectly foresee future events, which suggests that parties can only engage in incomplete contracting.[12] Frequency refers to volume, and, more specifically, whether the transaction (or similar transactions) is recurrent or singularly (or only once) occurring, which is assumed to have an "at least plausible" effect on governance structure. Asset specificity, defined as "durable investments that are undertaken in support of particular transactions, the opportunity cost of which investments is much lower in best alternative uses or by alternative users should the original transaction be prematurely terminated" (Williamson 1985, p. 55), is by far the "most critical dimension" (Williamson 1985, p. 30) in the theoretical framework and, consequently, has "received the most attention" (Klein 2005, p. 438) also in empirical research.

These dimensions are closely related to the behavioral assumptions in TCE. Actors are assumed to be boundedly rational, in the sense that their behavior is "*intendedly* rational, but only *limitedly* so" (Simon [1947] 1961, p. xxiv), and opportunistic in the sense of "self-interest seeking with guile" (Williamson 1985, p. 47). Bounded rationality implies that that "*all complex contracts are unavoidably incomplete*" (Williamson 1996c, p. 37; emphasis in original) while actors' self-interested guilefulness suggests that contract incompleteness may tempt actors to take advantage of situations arising ex post. This problem is significant where actors have made (or need to make) highly transaction-specific investments (asset specificity), which make them vulnerable to opportunistic behavior from other parties to the contract (Williamson 1975, pp. 7-10 and 26-30; 1993). For any such transactional commitment creating a situation where there are appropriable quasi-rents and these are large enough to create a sufficient incentive to be opportunistically (mis)appropriated, there is a basis for such "holdup" problems (Klein, Crawford and Alchian 1978).

The risk of opportunistic behavior signifies an important part of the costs of transacting. For market-organized transactions, each of the transacting parties has high-powered incentives to respond autonomously to changes in a fluctuating environment; the price mechanism is therefore an efficient mechanism for bringing about adaptation. The organizational problem arises where changes amount to disturbances that require *coordinated* responses, which may not be explicitly regulated in incomplete contracts. Under such circumstances, self-interested parties will engage

[12] Williamson stresses that TCE "is different from but not hostile to orthodoxy" (1996c, p. 3). It focuses on studying institutions in economic organization and relaxes, in its analysis, some of the very strict assumptions in the "main tradition" in economics such as economic man's rationality and perfect information.

in costly bargaining to maximize their share of any resulting gains.[13] Whereas this is in itself suboptimal, "[t]he main costs […] are that transactions are maladapted to the environment during the bargaining interval" (Williamson 1991a, p. 279); the direct costs of bargaining are seen as "a subset of transaction costs" (1991b, p. 175).

Maladaptation (transaction) costs[14] therefore generally arise "[w]hen bilaterally dependent parties are unable to respond quickly and easily" (1991a, p. 282) to changing circumstances and are intensified by the existence of asset specificity since "a condition of bilateral dependency builds up as asset specificity deepens" (1991a, p. 282). Asset specificity is thus an important predictor of transaction costs; indeed, it can usefully be argued that the "economic relevance of specific assets is that they create the potential for holdups" (Klein 2010, p. 120) and therefore drive or cause maladaptation.

The crux of the economic problem of adaptation, when identifying transaction costs as maladaptation, is therefore one of choosing the most cost efficient governance structure for the particular transaction. The discriminating alignment hypothesis accordingly states that "transactions, which differ in their attributes, are aligned with governance structures, which differ in their costs and competencies, in a discriminating (mainly, transaction-cost-economizing) way" (Williamson 1991a, pp. 277).

The rationale for vertical integration in firms follows from transaction cost economizing: bilateral dependency suggests that hierarchical organizing may provide an opportunity to gain from not incurring maladaptation costs. This advantage arises due to the different means used when organizing transactions within the firm (Williamson 1991a, pp. 270-271): the firm is "characterized by coordination through authority relations" (Madhok 2002, p. 536; cf. Simon [1945] 1957) that produce adaptive advantages. Hierarchy furthermore reduces incentive intensity (Williamson 1991a, p. 277; 1985, ch. 6; 1988) since individual actors within the firm cannot make legitimate claims on any coordinative gains.

Governance choice for a transaction is a cost minimization problem taking into account the transaction costs in the market and the costs of bureaucracy in formal organization (Williamson 1985, pp. 148-153). Market organizing benefits from the higher incentive intensity and matchless autonomic adaptation to changes, while it suffers from a lack of administrative controls that makes coordinated adaptation very costly or impossible; hierarchical organizing has the exact opposite advantages and disadvantages. Williamson does not discuss comparative allocative efficiency, but focuses on the effect of transactional attributes on the costs of governance. In fact, he dismisses this concern of resource allocation as being of secondary importance: "economics was [earlier] too preoccupied with issues of allocative efficiency, in which marginal analysis was featured, to the neglect of organizational efficiency, in which discrete structural alternatives were brought under scrutiny" (1991a, p. 177). Consequently, Williamson seems, how-

[13] Williamson here seems to talk about a kind of "collective action problem" along the lines of Mancur Olson (1971), but in very small groups with a formal and explicit collective good.

[14] Williamson identifies, inspired by Barnard (1938) and Hayek (1945), adaptation to changes in the transactional context as the central economic problem and adopts Arrow's characterization of transaction costs as the "costs of running the economic system" (1969, p. 48) to identify transaction costs as "maladaptation costs."

ever indirectly and implicitly, to assume that some form of allocative optimality obtains for the each of the alternative means of governance due to the alignment of transactions with governance structures. This follows from the role of specific assets in the TCE framework, where a resource's degree of specificity to a transaction is an important driver of governance choice. In other words, resources with very high relative productive value in a particular transaction will tend to be employed in that transaction, and the appropriate governance structure will be chosen since "such specialized assets lose productive value when redeployed to best alternative uses and by best alternative users" (1991a, p. 282).

But whereas this argument potentially means that allocative inefficiency is not a relevant concern in the analysis of transaction organizing, it seems to suggest that there is a real and significant difference between discrete governance alternatives in terms of their productive resource structures. Since resources are assumedly always used in those transactions where they have highest productive value, the relative productive value of the highest *alternative* uses (their transactional opportunity cost) predicts governance form. Comparatively high productive value of a resource in alternative uses (or users) suggests either a low degree of complementarity (in the sense of being easily used with other resources) or a high degree of substitutability (in the sense of many available potential replacements in the market). It is furthermore predicted that such transactions will be subject to market organizing.

We therefore have that

$$TC = f(s, c) \tag{3}$$

where the magnitude of transaction costs (*TC*) is a function of asset specificity expressed in the form of the resource's substitutability and complementarity. The higher the complementarity and lower the substitutability, the higher the transaction costs. It should be noted that the productive use and productivity of a resource tend to increase as its specificity increases (Smith [1776] 1976; Lachmann [1956] 1978), which means a complex and highly productive market would primarily deal with highly specialized factors. It is therefore reasonable to assume that the resources with relatively high-value alternative uses analyzed in TCE should enjoy a high rather than low degree of complementarity and therefore that these resources, as identified in the previous paragraph, must be relatively highly substitutable. In the market, therefore, transactions employ (are dependent on) resources that either have a low degree of complementarity (implying high substitutability, since very low complementarity tends to imply rudimentary specificity or specialization) or a high degree of complementarity combined with a high degree of substitutability. Vertically integrated transactions should therefore, following Williamson's asset specificity argument, almost exclusively employ resources with a high degree of complementarity combined with a low degree of substitutability.

	Market	Firm
Resource Comple-mentarity	High or low	High
Resource Substi-tutability	High	Low

Figure 2. Summary of differences in productive resource attribute in firm and market organizing.

Along the lines of the discriminating alignment hypothesis we therefore find that, with high asset specificity interpreted as high complementarity combined with low substitutability, resource allocation cannot be the same within firms as within markets. In fact, transaction organizing should be structurally different within firms in such a way that it is not economically feasible (and potentially practically impossible) to organize the same transaction in the market; the limitation here lies with the market, which is unable to deliver high substitutability for the specific resources. If high substitutability was offered, there would be no firms since transaction costs would necessarily be low.

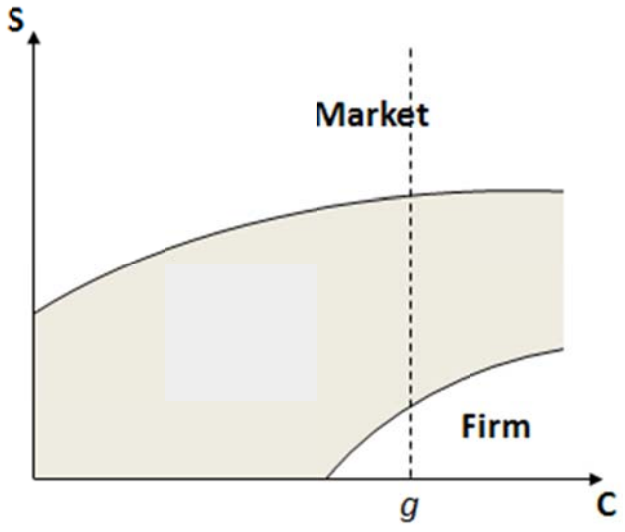

Figure 3. Summarizing the discriminating alignment hypothesis with asset specificity expressed as substitutability (S) and complementarity (C).

The specialized market economy implies a high and increasing degree of complementarity (c) through specialization and the division of labor and capital into more efficient yet more narrowly defined means toward specific ends. This overall progress of the market towards more highly specialized production processes implies a constant shift along the x-axis in Figure 3 toward the right. It can therefore be assumed that in any advanced market economy, complementarity is already established at a relatively high level. In Figure 3, this is represented by the dashed line labeled "*g*." All relevant combinations of substitutability and complementarity should be to the right of *g*, and as the market becomes increasingly complex we should see *g* shift outwards to the right. This leaves, at least for advanced market economies (cf. Williamson [1993] 1995, pp. 219-221), only substitutability as a relevant dimension for the transaction cost analysis of governance structure; in other words, asset specificity can be analyzed in the simplified form of substitutability if we assume a constant and high degree of resource heterogeneity. For a specific market or transaction, however, it is likely that complementarity and substitutability increase in a sequential manner in the dynamic market process (see below).

As suggested by the discussion above, and as illustrated in Figure 3, market organizing is dependent on resources being comparatively homogeneous (in the form of high substitutability) in terms of their usability for certain services in production processes. This does not imply that all resources to be traded in the market must be always and forever perfectly homogenous; it simply means that a certain degree of substitutability is required for market organizing to be advantageous in terms of transaction cost economizing. In other words, as resource heterogeneity increases and approaches uniqueness we would expect transactions to become more vertically integrated.

The conclusion is uninteresting for common transactions, since by definition a commonly carried out transaction should utilize highly substitutable resources. This ties in perfectly with the frequency dimension of characterizing transactions: highly frequent transactions should tend to employ unspecific or commonly available resources. For infrequent transactions, the "[i]ncentives for trading weaken" (Williamson 1979, p. 252) with more idiosyncratic transactions and therefore formal governance becomes more important. Yet there seem to be two distinct situations with idiosyncratic transactions with different implications: one where the unique transaction can be carried out using only (or mostly) resources commonly available in the market, and one where the unique transaction is carried out using highly specific resources. The former is possible under market governance since all the resources used are already available and traded in the market, which suggests that the value in the idiosyncratic transaction my initially be much higher than the second best use. However, since the resources are readily available we would, assuming the transaction is profitable, expect the competitiveness of the market to soon erode any appropriable quasi-rents through reproducing the transactional structure. The transaction would be expected to be idiosyncratic or unique only for a limited time, which implies that an established hierarchical governance structure would soon disintegrate due to quickly arising cost disadvantages. We should therefore see no lasting firms integrating idiosyncratic transactions using unspecific assets.

The latter case, with an idiosyncratic transaction carried out using highly specific assets, would necessarily have to be integrated within a hierarchical governance structure. In this situation, the transaction is (likely) infrequently carried out and utilizes resources characterized by high complementarity and low substitutability (the resources are, therefore, highly specific). It cannot be established in the market place since all or most (or at least some of the most important) assets are unavailable for procurement in the market. This confirms TCE's predictions and, again, suggests that the firm's productive resource combination is structurally different from market organizing.

Firms are therefore "not merely extensions of markets, but employ different means" (Williamson 1991a, p. 270). The claim that the firm "has no power of fiat, no authority, no disciplinary action any different in the slightest degree from ordinary market contracting" (Alchian and Demsetz 1972, p. 777) is therefore "exactly wrong." The hierarchical mode of governing transactions means that "firms can and do exercise fiat that markets cannot" (Williamson 1995, p. 43); the firm's authority relation is essential to governing transactions utilizing resources of a high degree of specificity (low substitutability), since "[r]ecourse to fiat provides better assurance that adaptations […] will be performed in a coordinated way" (1991b, p. 164).

Williamson originally followed Barnard (1938), Coase (1937) and Simon (1951) in identifying the employment contract as the source of authority within the firm (see also Masten 1988). The authority relation in hierarchies, he wrote, "involves capitalist ownership of equipment and inventories coupled with an employment relationship between capitalist and worker." The firm's "flexibility" in adapting to changing circumstances emanates from the fact that "the employee stands ready to accept authority regarding work assignments" (1985, p. 218).[15] In later works, however, Williamson stresses the "separate and complimentary" concept of forbearance as the basis for authority in the firm (1991a, pp. 97-100; see also 1994; 1996d; 2002a; 2010). The forbearance doctrine acknowledges that "courts will refuse to hear disputes between one internal division and another," and that therefore "the parties must resolve their differences internally" (1991a, p. 274). The source of authority within the firm consequently lies in the fact that its internal affairs are (mostly) beyond the reach of [legislated] market law.[16]

SPECIALIZATION AND THE TRANSACTION COST ANALYSIS

Whereas Williamson has argued that TCE is an "empirical success story" (1996a, p. 55), the discussion above suggests that the implications of asset specificity are not necessarily consistent

[15] Compare to Coase's statement that the employment contract entails that "the factor, for a certain remuneration (which may be fixed or fluctuating), agrees to obey the directions of an entrepreneur *within certain limits*" (1937, p. 391) or March and Simon's view that it is an agreement "that within some limits (defined both explicitly and implicitly by the terms of the employment contract) [the employee] will accept as premises of his behavior orders and instructions supplied to him by the organization" ([1958] 1967, p. 90).

[16] This argument is peculiar since it assumes a monopolistic legislative power to which firms are defined as its negation. It seems without a monopolistic state with a legal and court system, it is quite unclear what a firm is and – especially – what is the basis for the authority relation. In other words, the "forbearance doctrine" begs the question what would be a firm without an all-encompassing state, for instance in a stateless or severely underdeveloped society: would there be no firm or would all of society necessarily be considered a firm where there is no enforced contract law?

with the Coasean view of the firm. We can identify two different but equally possible reasons for inconsistency between Coase's and Williamson's accounts of transaction cost analysis as relates to asset specificity.

First, the Coasean firm, which is supposedly adopted by Williamson, does not (at least not to Coase) rely on differences in specialization for different governance structures. Contrarily, the entrepreneur-coordinator, the only existing "specific asset" in Coase's analysis of the firm, is considered able to switch – supposedly almost instantaneously – back and forth between firm organizing and market contracting as the relation between transaction and organizing costs change.[17] This suggests that the productive structure of the transaction is essentially the same whether organized through market contracts or using the authority relation(s) within the firm. The Williamsonian firm, in contrast, supposedly organizes internally exclusively those transactions that are dependent on highly transaction-specific assets and therefore the structure of transactions within the firm must be different from transactions organized by market contracts. In other words, if a high degree of asset specificity means a transaction cannot be organized through market contracting but requires integration in a firm, then it follows that assets within firms are on average more highly specialized than assets used to fulfill transactions governed by market contracts.

It then follows that the manager of the integrated transaction *cannot*, as Coase (1937, p. 392) claims, find it "always possible to revert to the open market." Disintegrating the firm would mean restructuring the productive combinations of resources used to carry out the transaction since the highly specialized assets (high complementarity, low substitutability) utilized within firms must be incompatible with any used in similar (if any) transactions organized through market contracting. This is, after all, the reason TCE would expect them to be integrated in the first place. Alternatively, such specialized transactions either exist within firms or do not exist at all. In conclusion, the choice of governance structure is not a choice – governance structure appears to be given for certain types of transactions.

Second, while Coase does not attempt to identify a primary cause of transaction costs that indirectly calls for organizing transactions in firms, Williamson identifies asset specificity (as we have seen, primarily in the form of substitutability) as "the most critical dimension" of transaction costs and thereby assumes that the cost (risk) of opportunistic behavior is what ultimately drives vertical integration. According to Williamson (1985, p. 30), "[p]arties engaged in a trade that is supported by nontrivial investments in transaction-specific assets are effectively operating in a bilateral trading relation with one another," which, in turn, gives reason for opportunistic behavior. This begs the question of how such specialized assets come to be in the first place if they are in fact incompatible with (and therefore not traded in) the market. The potential for opportunistic action through creating a situation of "bilateral trade" means actors, realizing this, would either not engage in such trade (or, at least, not make such investments) or vertically integrate *in order to* make the necessary investments without risk for holdups. This seems to confirm

[17] Coase does not discuss the role of the entrepreneur-coordinator in the market. In fact, it seems his analysis assumes the entrepreneur-coordinator comes to existence at the same time as and along with the firm.

Williamson's thesis: the risk of opportunistic behavior induces actors to vertically integrate the transaction.

Put differently, we find that the holdup problem through asset specificity should only exist to the degree that actors fail to realize this risk ex ante, because otherwise they would choose to first vertically integrate the transaction and then make the necessary investments. But this conclusion seems to, at least in part, contradict Williamson's thesis since the choice at hand is then not for governance structure, which appears as given for transactions requiring specific assets, but whether to go through with and make such investments in the transaction in the existing firm. The choice, in other words, is whether to carry out this type of transaction (which requires a certain type of governance structure), a decision that in itself depends on the parties first settling on the terms for integrating in a firm.

As we saw in the previous sections, both Coase and Williamson seem to heavily rely on the effects of specialization in their analyses of the market and organization – but in different ways. Williamson's emphasis on asset specificity is a case in point. But whereas Williamson's firm is explained by and created around highly specific assets, Coase's firm "need imply *no* specialization" (1988b, p. 4; emphasis added) and likely *cannot* be created around highly specific assets. Coase's point of departure in the "specialised market economy" implies a certain degree of specialization is necessary, but it is not regarded as having any explanatory power for economic organization; in fact, we have seen that Coase *dismisses* the specialization argument. It therefore seems Coase assumes a certain degree of complementarity while rejecting any significance of factors' substitutability in predicting vertical integration.

REINTRODUCING SPECIALIZATION TO ORGANIZATION

Coase and Williamson implicitly assume resource heterogeneity (cf. Barney 1991; Foss et al. 2007), which is necessarily a result of some form of specialization. Specialization is, as Coase acknowledges, fundamental to the market economy through the division of labor (Smith [1776] 1976), a prerequisite for trade and the reason for increased productivity through more advanced and roundabout production processes (Böhm-Bawerk [1889] 1959). Yet specialization does not only occur in the form of labor factors' concentration on more narrowly defined tasks, but also in terms of resources and capital goods. Lachmann talks about "a specialization of individual capital items [that] enables us to resist the law of diminishing returns" ([1956] 1978, p. 79) and uses the term "division of capital" to denote this type of resource heterogeneity. Specialization therefore implies an overall and increasing (as the divisions of labor and capital are extended) resource heterogeneity (as resources develop specificity to certain ends) as an economy develops and utilizes more advanced capitalist production processes; economic progress could therefore be formulated as a process toward increasing returns in the market place (Young 1928) through increased complementarity *and* substitutability.

In a situation with high complementarity and low substitutability, as in the case of high asset specificity, we can talk of capital as a *structure* of multiple complementary, heterogeneous assets (Lachmann [1956] 1978). Asset heterogeneity is existent to the degree that the assets have different or different levels of attributes (Barzel 1997) that are of value in a particular context.

The combinations of the individual assets' valued attributes in the particular setting implies that "each capital good [asset] has a definite function" and that within the established capital structure "all such goods are complements" (Lachmann [1947] 1977, p. 199). As attributes, and therefore an asset's function, change over time or as adjustments are made to the firm's capital structure, the degree of complementarity or substitutability – as well as the value of attributes – may change.

In terms of an asset's complementarity, it is necessary that there exists a plan to which the individual assets (and all complementary assets jointly) have specific functions. In fact, "factors jointly employed in the same firm tend to be complementary: they are all means to the same end, elements of the same plan" (Lachmann [1947] 1977, p. 201-202). In this sense, the assets need to be coordinated in order to provide the market with a joint service (such as production of a certain product). Lachmann's view of the firm's internal structure as one characterized by a high degree of resource complementarity and therefore division of capital is in principle similar to Adam Smith's discussion of the extensive division of labor in the pin factory ([1776] 1976, pp. 8-9). It is also similar to Robinson's discussion on the internal workings of the firm and how the firm needs to be of a certain size to "obtain the maximum profitable division of labour" (1931, p. 23).[18]

Along the lines of Smith, Durkheim ([1892] 1933; see also Land 1970) establishes that whereas the division of labor (and equally capital) is "limited […] by the extent of the market" (Smith [1776] 1976, p. 21), this limitation is established by the market's "dynamic density," i.e. individuals' ability "to act and react upon one another … and the active commerce resulting from it" ([1892] 1933, p. 257). Density therefore seems to be the reverse side of the Coasean [transaction] costs "of discovering what the relevant prices are" (1937, p. 390) – the costs necessarily decrease as the density increases and vice versa. In terms of capital, a higher degree of dynamic density should mean higher [realized] substitutability, since the "distance" to (i.e., the cost to discover) equivalent resources should be shorter (the costs lower).

But whereas density (or rather: the lack of density) establishes the limits of the market, its primary effect is to *enable* the division of labor. Without sufficient density, labor and capital cannot specialize and therefore there can be no division between tasks and functions. Robinson shows how "[i]n a small works the manager has many different functions to perform" (1931, p. 36) while "a large firm … divides the functions of management up into many parts" (1931, p. 38) to be carried out by different managers. While Coase seems to admit to the specialization of the manager within the firm, he does not discuss the effects of density within firms. Yet it seems likely that the density between complementary capital and labor could be maintained at a higher level than in a market, simply because the structure of tasks and functions within a firm is highly coordinated. This is also the effect of Williamson's asset specificity argument, where highly complementary resources that are limitedly substitutable – perhaps because they are *co*-specialized – would be found primarily within firms. Yet Robinson's discussion suggests an intu-

[18] Jacobsen analyzes Robinson's view of the firm and emphasizes that the latter "explains that the size of the firm is a function of the extent *and kind* of division of labor" (2008, p. 74; emphasis in original).

itive chain of events that directly contradicts Williamson's transaction cost explanation: the process toward increased asset specificity takes place within firms (rather than being a cause of vertical integration).

If this is the case, we must conclude that the transaction integrated in a firm could not have previously existed in the market. The reason for this is that there is a potentially fundamental difference between how Coase and Williamson view the market and transaction costs. Coase (1937) assumes market efficiency in the allocation of resources, which implies that each asset is already in its best use. The effect of transaction costs is simply transactional "friction" when coordinated through the price mechanism, which can be eased if coordinated in another manner (i.e., using authority).

Williamson's focus on opportunism and asset specificity, in contrast, does not imply "friction" in the working of the market and its functions. Contrarily, asset specificity suggests that there *is no market* (in the sense that substitutability is severely limited; see Figure 3 above) for the asset that must be used in a transaction, which is the very reason there are appropriable quasi rents. The assumption that the value of this asset is significantly higher within the particular transaction, as compared to any other transaction, means there is no or only a very limited market for it. In other words, the asset is not marketable for the use it has in this transaction since there is only one buyer (and possibly only one seller). Williamson suggests this when stating that the parties are "effectively operating in a bilateral trading" (1985, p. 30) when a transaction is supported by highly specific assets. Of course, in a bilateral trading situation, market density is very low.

The cost arising due to the risk of opportunism is therefore a cost on the particular transaction and its parties rather than a cost of using the market, as is the case in Coase (1937). In other words, there is no reason to believe that this transaction would come about were it not integrated in a firm. It follows that transactions integrated in firms are *innovations* rather than reproductions of existing transactions, which provides a dynamic function to the market that does not exist in Coase (1937). The Williamsonian market is therefore more compatible with the view of the market as a dynamic (and progressing) process than is the Coasean view.

The somewhat problematic Coasean view of the market follows from his analysis of the firm, which by definition is planned by the manager. However, it cannot be substantially different from the market in terms of structure, because such a condition would present a significant barrier for reverting to market organizing as relative costs change. This seems to suggest that production processes with a large number of highly complementary assets would not easily be established in the Coasean world, since such a capital structure would imply great search costs to find substitutes (such as spare parts) unless readily available in the market. Since this does not seem to be the case in Coase's view of the market and the firm in the market, we must assume that highly complementary assets need also be highly substitutable in the Coasean world. If this were not the case, then asset specificity (and therefore also the holdup problem) need be a significant factor in our analysis (which is the Williamsonian view, unless actors are assumed to not be self-interested), whereas to Coase it is not important (2006).

However, there seems to be a fundamental problem to this interpretation of the Coasean view. There is an obvious contradiction in an asset being both highly specific (complementary) for an end and yet, at the same time, always easily substitutable (for other assets). Such an unchanging state of things seems to imply that capital structures are not specific to certain ends and therefore that capital goods are close to being "like drops of water" (Lachmann 1947, p. 114) in the sense of being very highly substitutable. But this would, in turn, suggest that production structures are simple one-stage processes rather than "a complex, multistage process unfolding through time and employing rounds of intermediate goods" (Foss and Ishikawa 2007, p. 755). For any complex capital structure, we would expect to initially see increased complementarity and decreased substitutability. In other words, it seems the Coasean view of the market, lacking in dynamism, is one of only limited division of labor with only simple production processes, much to the contrary of the "specialised exchange economy" (1937, p. 390) that Coase assumes.

This is easier to see if we move to a higher level of abstraction and concentrate on the overall market process and changes in the overall market "level" of complementarity and substitutability over time. It has already been established that the division of labor and capital tends to increase over time and production processes become ever more roundabout and complex (Böhm-Bawerk [1889] 1959). In this market we would expect to see entrepreneurs eager for profit to attempt new combinations of productive means (which to Schumpeter ([1911] 1934) is what defines development). To the extent that these "new combinations" imply introducing new or dividing existing functions or tasks, entrepreneurial projects will imply specializing and, consequently, increased complementarity. This is especially the case where previously untried combinations entail changes in a whole chain of functions or tasks, or where sequential functions or tasks need to further co-specialize to attain the anticipated end.

Whereas complementarity is high for these resources in newly created productive structures, we would expect substitutability to be very low. Innovation causes specificity (uniqueness) that in a complex production structure is likely to mean a very high degree of complementarity, whereas we would expect innovations to rarely see substitutes already available in the market. Coase's market analysis does not offer relevant arguments to this type of situation. Whereas the Coasean entrepreneur simply reproduces existing production structures through supplanting the price mechanism with direction, the market appears quite static in the sense that it lacks creators of new production processes (not to mention new products or services). Obviously, new production processes or products cannot be created in firms, since firms by definition are but reproductions of market organizing.

Innovations also cannot take place in the market due to transaction costs (in the form of "finding out" the relevant prices) being infinite for resources that have yet to be introduced in the market – there is no market and a market cannot be created. As consumer demand changes, relative prices may change and therefore new firms may emerge while existing firms are discontinued. If we assume that demand for existing products can reach zero or an effective non-demand, then the number of products (and therefore production processes) in the market would tend to diminish over time. Important questions that remain unanswered include by whom, when, and

how new products may be created, how increased specialization can be brought about in the market, and, furthermore, how the market as a "specialised exchange economy" ever came about.

Williamson's view of the market seems more supportive of the overall development of more complex divisions of labor and capital. Capital structures within the firm may here be – and often are – very different from such established in the market place. The plan needed to establish a firm must be much more elaborated than is the case for the Coasean entrepreneur, since the capital structure within a firm has overall higher complementarity. Indeed, the plan goes beyond a very limited reproduction of already existing production structures; it includes the realization that there is a problem in the market of greater complexity than comparing costs, and, as a result, imagining a solution to this problem through putting together or innovating a new [kind of] capital structure to support an integrated production process. (The role of the entrepreneur is hence much more pregnant since the entrepreneur effectively creates a previously unknown capital structure and therefore necessarily bears the uncertainty of whether it will turn out profitable.)

While Williamson's view is primarily reactive to potential ex post problems, the focus on specificity suggests more far-reaching support of innovation and new combinations of resources than Coase's model. Yet to Williamson, rather than an opportunity to be realized, innovation is a problem incurred on parties to a transaction that must be solved through vertical integration. As we have seen, however, high-complementarity, low-substitutability factors can only be created in a high-density environment – especially in highly advanced market situations. Such innovations may be subject to opportunism, but should primarily be regarded as opportunities for profit. The problem at hand should therefore be how to realize the new combinations rather than how to avoid supplying highly complementary resources to make more effective transactions.

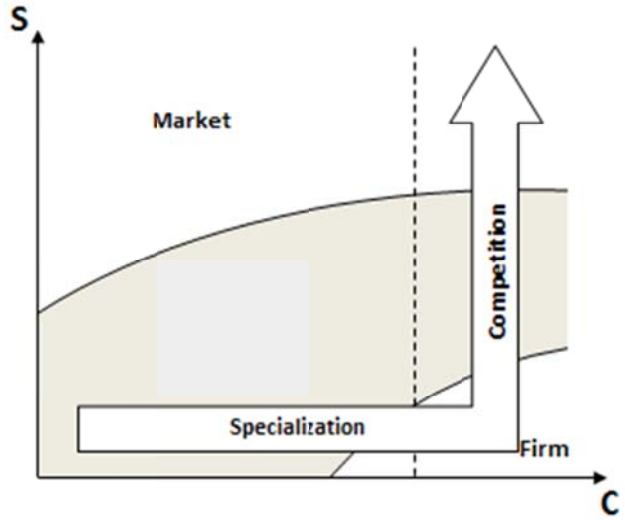

Figure 4. The market process in terms of complementarity (C) and substitutability (S).

The focus on specificity does seem to provide promising support for a competitive discovery process (Hayek 1978). Imagining a previously non-existent capital structure allows profit-seeking entrepreneurs to find new uses for existing assets, capital structures, or parts thereof,

as well as to discover or create new asset attributes and how to use them. These are mainly realized within firms due to the lack of market for the necessary parts. As these new capital structures have been created, they can readily be reproduced for or used as inspiration for other projects, which suggests that competing entrepreneurs may imitate profitable production structures to gain shares of profit opportunities. This imitation process of competition generates higher levels of substitutability for the specific resources, which then will be characterized as highly complementary and with high substitutability. In this way, as illustrated in Figure 4, the ongoing creation of specialized transactions integrated in firms could potentially lead the way toward greater overall division of labor (Bylund 2011) – and the process could very well be dependent in its intermediate step on the integrated firm.

CONCLUDING REMARKS

This paper has two main contributions. The first is the identification of fundamental differences within the transaction cost analysis of the firm and that there is a clear discrepancy between the Coasean and Williamsonian firms. Of course, the literature has previously recognized that Coase and Williamson represent somewhat different approaches ("emphases") and that their transaction cost frameworks may not be fully compatible. But whereas this is undoubtedly a true observation, the literature on transaction costs and the firm tends to think of Coase and Williamson as fundamentally the same approach: the transaction cost approach.

This paper argues that this is an overly simplified view that may even be in error. In fact, there are fundamental differences between how Coase and Williamson view the market and the firm, and, consequently, the interplay between markets and hierarchies. Furthermore, it seems the fundamental assumptions in their approaches are incompatible yet complementary. In terms of the former, it was shown that the Coasean transaction costs are friction costs in the market whereas in Williamson's study of the firm transaction costs arise due to the use of non-marketable assets. It was also shown that the Coasean firm in most respects is a mirror image of market organizing, where the price mechanism has been replaced by a manager directing resources. Williamson's firm, in contrast, tends to be structurally different from the market in that the transaction is integrated in a firm to avoid costs that arise due to extra-market specialization. In terms of the latter, Coase and Williamson have different foci that are, along with their implicit reliance on specialization, complementary. Coase aims to distinguish between two types of coordination as a means of explaining the market structure, while Williamson focuses on the conditions for effective governance of individual transactions. Both therefore contribute important insights to the workings of the market and the existence of firms.

It can also be argued that Coase and Williamson attempt to explain different phenomena. While this is outside of the scope of this paper, Coase tries to explain why there are firms in the first place, i.e. firm emergence in the market place. Williamson, on the other hand, seems to focus on the vertical integration of *two existing firms* involved in trade dependent on transaction-specific assets. The question is therefore not necessarily one of firm emergence, but of vertical integration of already integrated units. These questions overlap but may not always provide the same answer.

The second contribution of this paper is the distinctive perspective adopted in analyzing market structure and the role of firms. In order to explore the differences between Coase and Williamson in a more realistic setting, we identified that Coase and Williamson have adopted asset heterogeneity and specialization. Both of these concepts are alien to neoclassical economics, which is the framework within which both Coase and Williamson developed their approaches. Interestingly, these concepts were intensely used by earlier theorists of industrial organization – from Adam Smith to E.A.G. Robinson – who regarded them as main causes of integration. While Coase explicitly dismisses the division of labor argument to integration, his theory is based on and implicitly points to specialization through the divisions of labor and capital as important integrating forces. Williamson comes even closer to confirming this causal relationship through stressing asset specificity, but fails to identify the main weaknesses of while erroneously claiming to base TCE on Coase's theory of the firm.

As for the approach adopted in this paper, it should be noted that the conclusions point toward the old yet recently uncharted territory in the analysis of economic organization: the role and effects of specialization. Economics generally assumes markets with advanced division of labor, but does not further scrutinize the significance, meaning, or consequences of such an assumption. After all, the division of labor and overall specialization in society is assumed to continuously increase, yet the forces bringing about this general tendency remain unknown in economic organization. This paper aligns Williamson's analysis of asset specificity with a new research agenda (see e.g. Bylund 2011) attempting to introduce the divisions of labor and capital as playing a significant role in matters of organization.

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