

INSEAD

The Business School
for the World®

FIRMS VS. MARKETS: ANALYSIS OF FIRMS' EXISTENCE

Ekin Ilseven

Thoughts developed in the class Foundations of Strategy and Management, P2 2017

November 23, 2017

3 Firms versus Markets

3.1 The Market Structure

First of all, we have to make an important observation about markets: The markets have a cyclic and highly-connected nature. Every output market is an input market. I will demonstrate it with a trivial example. Imagine some vegetables being produced on a farm. It is 1) collected by people, 2) sorted out in boxes, 3) put on trucks and delivered to local markets, 4) sold by vendors, 5) bought by restaurant owners, 6) cooked by chefs and 7) delivered by waiters. What we see in this process is that till these vegetables reach a consumer in a restaurant, it crosses through many markets and not necessarily goods markets. While it is not very clear, we could suggest that (1) corresponds to "picking-up vegetables" market, (2) "boxing vegetables" market, (3) "goods delivery" market, (4) "goods vending" market, (5) "food buying" market, (6) "cooking" market and (7) "food service" market. If the farmer in market (1) goes to this restaurant, we see that the cycle closes. This analysis points out the cyclic nature of markets (shown with dashed arrows in Fig 1). Not only the markets can be cyclic, but each output market may have many input markets and vice versa. For example to produce a car, we need many more materials other than steel, electronics and paint. Hence, we are looking at a big web of markets, connected to each other through directional links (see Fig. 2).

A crucial component to be mentioned in this discussion is the labor market, which drives the activity in all of the markets. Without people, buyers and suppliers, markets would come to still-stand. This is where the firms enter the picture. To justify the existence of firms, I will look at two important factors. The first factor is that team-work can achieve more than individual-work. Let's look at the "goods delivery" market (3) given in the example. Just like Alchian and Demsetz's⁵ workers on the harbor who have to work together to load the truck, the people on the farm also need to work together to carry heavy crates of vegetables. So here we observe the motivation to get organized. It could be simply done by two people who do not know each other, but even then an unspoken idiosyncratic organization emerges during the job due to the necessities of team coordination. This factor shows that the organizations take place in the labor market between individuals. The second factor is discussed by many people in terms of Transaction Cost Economics, such as by A. Alchian and H. Demsetz, O. Williamson, O. Hart⁶: Team-work necessitates partnerships and alliances between individuals, between the suppliers of the labor market, and the partnerships are problematic for many reasons. However, we can say that the partnerships in the input market of labor is one of the points where the firm emerges; this is where we find "horizontal" hierarchies and organizations (see The Firm in Fig. 1) people working in parallel to achieve the same goal of acquiring from input markets and delivering to output markets.

We can summarize the discussion till now as following (and as in Fig. 2): 1) There are input markets with goods to be processed. 2) There are people (organized or not) who acquire and transform these products with labor and mediate them to the output markets, which is the next input market, and this picture repeats itself. This summary points out the next point at which firms of vertical character emerge, where people work sequentially. I can cut trees. A friend can carry the logs to the carpenter of the town, and the carpenter can make chairs. These are "vertical" transactions from one subset of the labor market across output/input goods market to another subset of the labor market (e.g. cutting trees, carrying logs, and carpentry). Once again, individuals might also partner up vertically and as soon as partnerships appear, the problems arise.

Having laid out the complex web structure of markets held together by the glue of labor, we analyze the firms versus markets dichotomy in horizontal and vertical directions and construct the notion of

⁵Alchian, A.A. and Demsetz, H., 1972. Production, information costs, and economic organization. *The American economic review*, 62(5), pp.777-795.

⁶Hart, O.D., 1988. Incomplete Contracts and the Theory of the Firm. *Journal of Law, Economics, & Organization*, 4(1), pp.119-139.

organizations in steps. The most simple, basic case would be (0) when one individual takes one input and transform it into one output. We can add complexities to this in three different ways: (1) We might have *many* individuals that take the one input and turn it into one output together (such as loading trucks where muscle-power is the input and loading is the output), (2) one individual that takes *many* inputs and turns it into one output (such as an artist taking paint and canvas as input and creates an art-piece as the output), and (3) one individual that takes one input and turns it into *many* outputs (such as a programmer who turns his programming skills and writes many softwares). Although case 3 is listed just theoretically, it might not be the case in reality. However, it plays an important role as explained later. Now we can construct any other case as a simultaneous combination of these three ⁷ and discuss the emergence of organizations in this framework. According to Alchian and Demsetz and O. Williamson, case (1) is sufficient to have an organization; when many individuals come together, opportunistic shirking becomes possible. For example, hold-up problem does not have to be originated only at the supplier from a different market; it can be from a horizontal partnership such as team-mate as well. Moreover, each of these cases show that there has to be vertical transactions between the individual and those in the input and output markets.

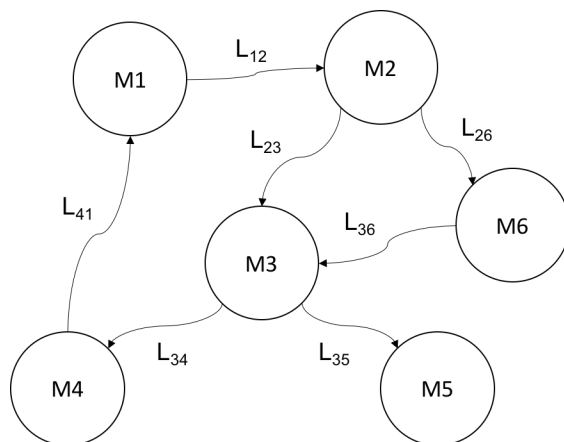


Figure 2: The market structure. Each market is connected to each other through labor markets, or mediator markets. The firms emerge in these markets. Assume a firm exists in market L_{23} . Backward integration would be getting organized in L_{12} , where as forward integration would be for example getting organized in L_{34} . We can say that this firm is furthermore vertically diverse as there are two arrows going out from its output market, namely L_{34} and L_{35} . Horizontal integration can take place in individual labor markets L_{ij} or across markets. For example, if the firm in L_{23} partners up with a firm in L_{36} , this would be horizontal diversification. If they acquire the other firm, then horizontal integration.

3.2 Horizontal Diversity in Organizational Labor Markets

I first focus on "many individuals" in the case (1). The trivial case of many individuals not interacting with each other and doing their own job would correspond to case (0), as they are all perfectly separable. However, we are interested in the cases when they have to get together to achieve their output goals. There can be two different reasons for forming organizations: First is people need to cooperate to achieve more, which would partially belong to Alchian and Demsetz's and Thompson's (1967)⁸ perspectives. Originating from building a team, second reason would be due to monitoring problem, the inefficiencies

⁷such as 1+2: *many* individuals that take the *many* inputs and turn it into one output together

⁸Thompson, J.D., 1967. Organizations in action: Social science bases of administrative theory. Transaction publishers.

and opportunistic behavior of individuals, where we could refer to Coase's and Williamson's works. The market price mechanisms would be too costly compared to intragroup mechanisms. Through these two mechanisms, we find people forming groups. Following Thompson's (1967) model of how organizational design should be, we consider three ways in which the individuals depend on each other: 1) Pooled interdependence, 2) sequential interdependence, and 3) reciprocal interdependence. Each case also has a naturally assigned way of coordination: 1) Standardization, 2) coordination by plan, and 3) mutual adjustment. The organizations can be established in this sense, whenever many individuals need to coordinate as they depend on each other. Furthermore, these organizations will be found in every labor market (denoted by L_{ij} in Fig. 2). For example, we have groups of people who are experts in information technology (IT), as well as farmers who are experts in planting seeds. Unions could be seen as an example for this case. These actions of organizing are found in a horizontal level, between an input and output market, and when a group includes subgroups, we can say that it is organization-wise horizontally diverse. But why would horizontally diverse organizations emerge?

3.3 Vertical Integration towards the Input/Output Market Level

Having these groups formed between different input and output markets may still be inefficient. Here, cases (2) and (1+2) play an important role of integration: One or many individuals take many inputs and make one output. A very simple example would be a pilot taking many inputs from the cockpit devices in a plane and make a decision about directing the plane, hence the decision is the output. On a more macro-level, a board of managers getting information from different departments to form directions, or a farmer getting seeds, water and fertilizer from different sources to produce a vegetable would be examples for this integration step. In these cases the question of vertical integration arises. Should the pilot try to gauge wind speed himself? Should the manager analyze social media activities (normally monitored by marketing department) to make an investment decision? Should the farmer produce his own seeds, water and fertilizer? When the answer is no, then the vertical integration does not take place; and when yes, it does. First of all, the natural structure of vertical integration is based on the sequential interdependence, which requires planned coordination, because an output market always depends on an input market and they form a sequence of input and outputs. Such sequences can be formed by sequential combinations of cases (1), (2) and (3)⁹. Vertical integration can take place also towards the output market, where the firm would decide to serve the next output markets for some reason. These actions are shown with the red arrows in Fig. 1. However, once again we have to be aware that when we say that a firm vertically integrates towards an input (output) market, we are actually saying that the firm gets organized (either by forming own organization, or by M&A) in the labor market below (above) that input (output) market; hence firms do not vertically integrate into markets but across them. Any firm that does not get organized in a labor market is simply an "individual" buyer in an input market (or an "individual" supplier in an output market), who relies on market mechanisms to make transactions. In this case, considering also the case (3) now, the firm would become the individual buyer or supplier in an input or output market and can not be differentiated from persons.

3.4 Vertical Diversification and Horizontal Integration

At this point, I would like to shortly propose some integration and diversification concepts. From previous discussion, we conclude that single persons and firms can not be differentiated from the transaction point of view, unless they go through an integration process. The firms do not necessarily have to integrate towards new input/output markets, when they want to diversify their source/product portfolio. Acting as

⁹(1+3)→(2): many individuals take one input and turn it into many outputs, which are then taken by one individual and turned into one output.

individuals, firms can simply establish contracts and transactions and still expand towards these markets. This would be called vertical diversification. A car production company buying steel might also want to buy aluminium. Similarly the firm that sells the aluminium to the car producing firm might decide to sell just as much to kitchen utensils production firms. The cases (2) and (3) correspond exactly to vertically diversified producers. When the firms get organized in the corresponding markets, then vertical integration takes place. I use the term vertical diversification instead of the horizontal diversification, because I reserve the term horizontal for the activities found in the same markets, at the same levels. Hence, any organization that is formed in a market corresponds to horizontal integration. An interesting remark is that a firm integrating vertically or horizontally will always become more diverse by definition. All the concepts of diversification, integration and market structure are explained and demonstrated in Fig. 2.

3.5 What are markets exactly?

These discussions lead to the answer of the main question. The firms emerge against the price mechanisms set by other "mediators" of inputs to output markets and vice versa. I used till now labor market as the mediating market, however we saw in the section "Horizontal Diversity in Organizational Labor Markets" that it is not only people who can provide labor and make a product, but also firms. When people get organized for some reason, they will get integrated into an organizational form which separates them either from vertical or horizontal mediators. If they do not form such an organization, however still operate together, they can stay at best vertically or horizontally diverse. The revelation of mediator market and its actors' structures bring us back to the discussion of price mechanisms utilized by Coase (1937) and further analyzed more recently by Demsetz (1988). Demsetz points out that when a transaction or contract is made between a buyer and a supplier, this transaction or contract not only includes a collection of promises of an economic exchange but also the value of efficiencies occurring thanks to the act of organizing. I would like to mention two perspectives towards contract in that sense. First of all, the prices in the market will be lower due to more efficient team-work of individuals. Second, when individuals get organized, the overall heterogeneity of opinions in a market, hence the uncertainty, decreases. This means that the market price mechanism will also become more efficient. Parallel to Coase point of view, we have a driving force of getting organized (maximizing team-work and minimizing inefficiencies), while also a decreasing upper boundary of prices and inefficiencies of market price mechanisms, such that when the marginal gains from maximizing team-work and minimizing inefficiencies meet the marginal losses due to market price mechanisms, the equilibrium of firm size is obtained.

3.6 What is firm size?

This picture is another statement of Coase's work, but does not answer one question: How is firm size measured? E. Penrose (1957) says "expansion can be measured in constant monetary units of investment", which implies that the integral of such units of investment over time will provide the size. While this might be a useful operationalization of size and growth, the aspect missing to it is the multi-dimensional market structures, in which the firms are embedded. We have to be careful about where the investments are made. Measuring growth through investment in input markets (diversified or integrated) might be incomplete, as well as any investment towards output markets. Moreover, it might be necessary that every investment is weighted differently. Assuming that every investment in every market (from intrafirm departments representing "knowledge markets" such as IT, Marketing and Sales etc. to cross-market partnerships where tangible goods are traded) has the same importance might be too crude. Similarly, any size measurement that relies on output markets might be erroneous as the output markets are highly dependent on the higher level input/output markets, as well as depends on the successful implementation

of horizontal and vertical integrations which form the firm itself.

3.7 Isomorphism through Mediators and Organizational Structure

The problem of measuring size necessitates the understanding of the relationship between the firm, its input/output markets and its horizontal markets. I call it the isomorphism problem. First, a firm has diverse input contracts/transactions. Second, it has tangible resources in every input/output market that it crosses, as well as intangible ones especially in the mediator markets. Finally, we observe outcomes of these production processes in sales and market share (industry-wise outcomes). The question would be how does a measurement of size in the input level would translate into a measurement in the output level. If we have a perfect translation, we could use any information in the market of choice and base all our analysis there. However, this is not always the case. Size is measured in each market in different metrics; each market has its own capacities, own externalities and own uncertainties. For example, Thompson identifies the responsibility of managerial interface between the technological core of a firm and the institutional environment as protecting the core by using buffers (regulation in capacities) and leveling the environment (regulation of externalities) as much as possible. Penrose, similarly, points out that the entrepreneurial management's actions define the growth capabilities of a firm by their successful efficient allocations. Hence, an accurate measurement of size must require analysis of the degree of isomorphism between the input and output markets, as well as how well the organization works. All these variables will contribute to the firm size in a complementary way and, at this point, we see that Coase's concept of firm size, which balances itself against the market forces, is not insightful enough to provide accurate ways of measurement. The question of how to measure the firm size accurately is an old question in the field and, in this writing, I leave the attempt of answering it to a later discussion.

Now, I focus on the organizational structure, the structure of organized transformation (mediation) of input goods to output products. An organizational structure can be categorized into two: formal and informal. The formal structure of organizations are the main discussion topic of Williamson's work "Market and Hierarchies", as well as of Transaction Cost Economics. The more efficient a firm works, the more value they can create and avoid costs. However, the informal structure also plays an important role. This corresponds to the social aspect to the firm's boundaries, an important perspective developing in the recent years. The work by Kogut and Zander (1996)¹⁰ shows how coordination, identity and learning contribute to the boundaries of a firm and how it functions. I assign this aspect of organizational boundary (size) in the organizational level. The work that is now associated with knowledge-based-view of the firm can be seen as an extension of resource-based-view with intangible assets. While the social structure of a firm certainly introduces a new and interesting concept of firm size, I see it only as complementary to the other definitions of firm size, such as formal organizational structure, input/output market share, tangible resources and such. Furthermore, it plays an important role in determining the degree of isomorphism between the firm sizes in the input and output markets. A big company in input markets might have small size in the output market simply due to lack of coordination and identity. However, an ideal firm with perfect team spirit and coordination also might still fail and stay small due to bad managerial or entrepreneurial actions. As such, it is an internal factor that should be incorporated in the discussion of the isomorphism problem.

3.8 Different Approaches in Strategy Management Field

Before I move onto the conclusion, I summarize shortly the perspectives in strategy management field that developed in the past years. In Fig. 3, I show which approaches are concerned with which part

¹⁰Kogut, B. and Zander, U., 1996. What firms do? Coordination, identity, and learning. *Organization science*, 7(5), pp.502-518.

of Firms versus Markets dichotomy. We see that IO Economics is mainly focused on the analysis of output markets (and possibly input as well). The resource-based-view can be found mostly in the input markets as production facilities require investments into the resources. I put the knowledge-based-view at the firm level as it is concerned with the information-processing capabilities and social dynamics of the firm. The complementary economics based approaches to input markets and the inner mechanisms of the firms are the Agent Theory and Transaction Cost Economics. While the Agent Theory is mostly concerned with the shareholder-agent relationships, Transaction Cost Economics encompasses intrafirm and interfirm transactions as well (hence its location on the graph). The entrepreneurial action taken by Penrose’s entrepreneurial managers are mostly concerned with increasing the efficiency of allocations in a firm as well as expansions, while the organizational action (Penrose’s required managerial resources) is focused on maintaining of intrafirm and extrafirm relationships.

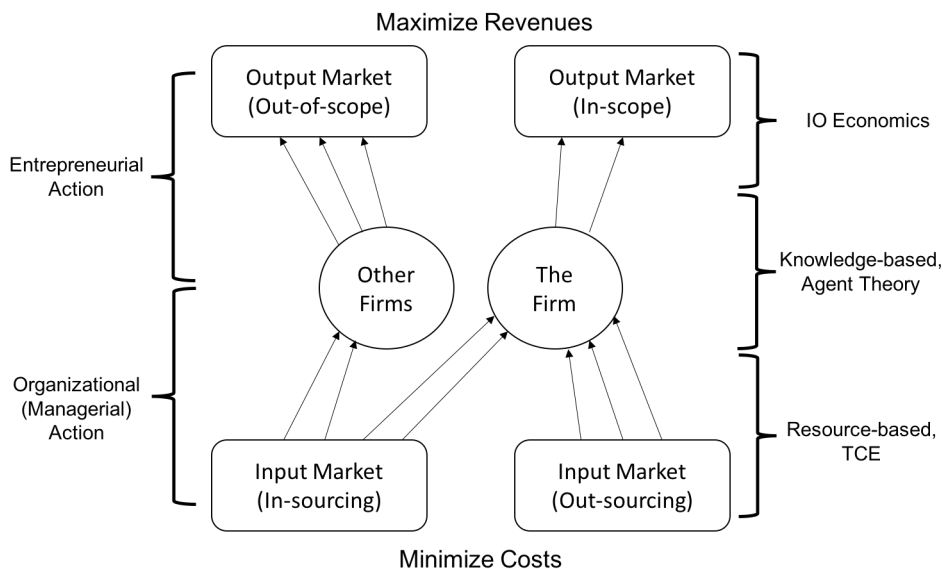


Figure 3: The Firm vs. Market diagram from academic perspective

4 Conclusion

There are couple of main points that are presented in this work. First of all, the firm is not facing simply a market but an interconnected structure of them at the same time. The firm might be bigger in size in some of them and smaller in the others. While the size is mainly dependent on the present price mechanisms, it is important to denote that this market price mechanism can not be independent of the presence of other firm price mechanisms. Efficient firms will seek more efficient transactions, lowering the market prices, decreasing the size of the firms. This shows that the size distribution of firms might have an endogeneity. Second, we discuss the cyclic nature of markets which reveals a directed network structure between markets. Every market is an input and an output market, connected by firms. The firms are the efficient transfer mechanisms from one market directed to the other and emerge against the other transfer mechanisms. They extend over the network of markets if they can find more efficient and reliable ways of connecting two markets and the extensions are realized through vertical and horizontal integrations. Furthermore, the isomorphism between the sizes in input and output markets is questioned. While it seems like the input market and the organizational structure are the closer measurements of size, the measurements in the output market might actually indicate an effective size. At the same time, they

might follow different paths due to their entrepreneurial drive. I would like to finish this writing with some open questions.

1. If the firm emerges in response to price mechanisms of market, which in return consists of supplier of different structure such as from individuals (which are not firms) and small sized firms to big firms, do we find a correction to the size? The transaction costs doing business with an individual might be higher than doing business with a small or big firm. I propose that markets which are populated by bigger firms will lead to less entry (due to barriers to entry) and an overall decrease in size because market is more efficient. It should follow that while the bigger firms feel this decrease less the smaller firms should see the effects more. Then, the next question is where is the equilibrium? Although I discussed it shortly earlier, I would be interested in finding a formal model of equilibrium.
2. In Fig. 1, we see that through backward integration the firm itself becomes its own supplier as well as supplier for others, which brings up an interesting question. How are the performances of in-house sources supplying the firm itself compared to those which produce it only for output market? I propose that the in-sourcing practice weakens the "entrepreneurial action" necessary for the driving aspirations to manage more efficiently as well as develop competitive strategies. This is caused by the in-house matching of input-output market. The work by Puranam et al.¹¹ model plural sourcing as means to keep the aspirations and the entrepreneurial spirit up, while also reducing the out-sourcing costs. The follow-up would be how important is it to supply to other firms by this in-house production as well? This would mean that the expenses for developing competitive strategies would go up (such as marketing and sales expenses), however if the returns are high enough, such an action might replace the need for plural sourcing. Rumelt (1974) investigates the verticality, relatedness and diversity of many firms and points out that many firms have to also sell externally even if they produce in-house. It would be interesting to look at such interdependencies in the framework presented above.
3. What is the accurate way of measuring firm size? We see that firms are parts of a highly connected complex market system, related to each market in a different way. Moreover, the inner mechanisms and organizational structure of a firm plays an important role. What would be the implications of such a measurement?

With this work, I aimed to have a more detailed discussion of the theory of the firm, what is the relationship between markets and firms and the measurement of the size of the firm. They all constitute important concepts to management sciences and could lead to better understanding of different approaches and their combinations in strategic management.

¹¹Puranam, P., Gulati, R. and Bhattacharya, S., 2013. How much to make and how much to buy? An analysis of optimal plural sourcing strategies. *Strategic Management Journal*, 34(10), pp.1145-1161.