How much should you learn before entering a market?

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New markets can be death traps for blinkered firms.

Imagine you head a large carmaker, such as Volkswagen, at the start of the Chinese economic reforms in 1978. You know that an enormous market is opening up. But after decades of Chinese import-substitution policies promoting local self-reliance there is substantial uncertainty about the best way of entering the market. It is unclear, for example, what the best production and distribution alternatives are, whether you should ship your cars from Germany or manufacture locally. And if you decide on local production, you need to determine whether you should produce in one or in several facilities, where they should be located, and how best to get the products from those facilities to customers. Given that you are entering new territory, none of these questions have an easy answer.
Even the cost of entry is not readily able to be determined beforehand. Each of the alternatives has its own cost implications, both for the entry itself and for the profitability down the track.

The one certainty you do have is that other carmakers are evaluating the opportunities in China at the same time you are.

The natural reaction to the uncertainties surrounding entry into a new geographical market is to first conduct market research to determine the demand, to investigate various production and distribution alternatives, and even to experiment with alternatives, before committing to market entry.

The natural reaction to the threat of entry by competing carmakers is to pre-empt their entry. Being the first in a growing – but still fledgling – market may enable you to prevent competing entry for a considerable period of time. Alternatively, one could join forces by creating a joint subsidiary to access the foreign market. If one was to go down the cooperative route, one would have to determine the best timing, how to select the best among the two firms’ ideas, and how to share the fruits of market entry. A complicating factor is that often much of the information acquired by one’s potential competitor during the investigation is hard to verify prior to collaborating.

Note that, even though we have described the decision problem as one of companies contemplating entering new geographical markets, it is not specific to this application. For example, when firms are engaged in a race to obtain an innovation, they often start by building small prototypes or running small-scale experiments before investing in a large-scale research project. Once a firm has started developing a new product, the race will often end in a merger, with one of the firms acquiring the research output of the other before the new product reaches the market. Sometimes, the firms’ investment decision is mediated by an outside agency, such as a venture capitalist or a granting agency. The questions of how much time to spend in experimentation, and whether to enter alone or jointly, apply here as well.

The present writers explored this topic in a recent paper published in the journal *Economic Theory*. The focus of the research was to use an entry-timing game to better understand the interplay between information-gathering experimentation and collusive behaviour, and to study collusive mechanisms between two firms engaged in developing new products or accessing new markets. The questions we wanted to answer were: Do firms invest too early or too late? How does the fact that signals are public or private affect entry-timing decisions? When do simple compensating payments allow firms to achieve the collusive outcome? What share of the surplus should accrue to each firm in the collusive transfer scheme? And, what is the optimal time to implement cooperation?

The role of assumptions

To answer these questions, we studied investment decisions by two firms competing to enter a new market or develop a new product. However, instead of examining a host of case studies, we chose to apply economic theory. The concept is simple: One identifies a problem’s salient features, possibly backed by empirical observations, strips out all non-salient information, and identifies the logical implications of those features for individual – in our example individual firm – behaviour. For our purposes, the salient features that we needed to capture were (i) varying degrees of, and uncertainty about, the profitability of entry; (ii) the ability to learn over time; (iii) possible competition in entry; (iv) the ability to join forces; and (v) the complication that what one firm learns about itself is its private information, which it may have an incentive to lie about to its rival.

The simplest scenario containing these salient features is one with only two firms. Of course, this does not correspond to reality – there were dozens of carmakers...
contemplating entry into the Chinese market in the early 1980s. So, is it a useful assumption? This is a question that can only be answered by having in mind the questions we would like to answer. As a general rule, a particular, even highly unrealistic, assumption is useful as long as the answers to our questions, which we derive from the model, do not change significantly if we make a more realistic assumption. In that case, it constitutes a simplification that we are allowed to undertake. To give an example, virtually all markets fall between the extremes of a perfectly competitive industry and a monopolist whose product does not have a substitute. Nevertheless, we study models of perfect competition and monopoly because they teach lessons that hold true in more realistic models – and, indeed, in the real world. In our case, it turns out that increasing the number of potential competitors beyond two does not affect the model's insights.

Further, we assumed that, to begin with, the firms were uncertain about the cost of entry and that it could take on two values, either low or high. We also assumed for a host of reasons – including differing experiences, differing personnel, or differing underlying technologies – that entry costs were independently distributed across the firms. This meant that one firm's entry cost had no predictive power for the entry cost of any other firm. Unlike the duopoly assumption, this entry-cost assumption turns out not to be without consequence for the model's insights. The following limitation must therefore be kept in mind: What we derived with this assumption held true only if the correlation between the firms' entry costs was not too strong, that is, if each firm's idiosyncratic entry cost component was sufficiently strong as compared to their common entry cost component.

Firms gradually acquire signals about their entry cost through research and experimentation and, at the same time, form beliefs about the signals received by their competitors. At any point in time, irrespective of what they have learned about their entry cost, each firm can decide to enter the market. If both firms enter, they receive duopoly profits on the market; if only one firm enters, it will obtain monopoly profits. The firms in our study were assumed to make positive profits, net of the entry cost, as duopolists only when their entry cost was low and to make positive expected profits, again net of the entry cost, as monopolists when they had not yet learned their costs. The implication is that a firm that learns it has a high entry cost will not enter. More than two levels of entry cost would yield a qualitatively similar result providing that higher entry costs imply a lower likelihood of entering the market.

COMPETITION:
NO NEWS IS GOOD NEWS

With these assumptions, we first modelled the behaviour of firms competing in their entry decisions. This revealed that a firm with a low entry cost always enters immediately. Deferring entry implies receiving product market profits later and, because costs are firm-specific, this will not affect the competitor's belief about its own cost. Obviously, this would not necessarily hold if the competitor's entry costs were strongly positively correlated. If, in this case, a firm's optimal plan of entry is to enter immediately once it has learned that its entry cost is low, then its rival would infer that its own entry cost is very likely low, too, and would immediate follow suit. This suggests that the best strategy in this alternative case may be to manipulate a competitor's beliefs by waiting. Because, in the case with strongly idiosyncratic entry costs, a firm that has learned it has a low entry cost enters immediately, and because firms that have learned their entry cost is high do not enter, not observing the entry of one's rival amounts to valuable information. There are only two reasons why a rival may not have entered: either the rival has delayed entry because its experimentation has not yet produced information about its entry cost, or the rival has learned that it has a high entry cost and so will never enter. The latter implies that a firm that does not observe its rival enter becomes more and more optimistic – in other words, that no news is good news. Indeed, no news may be so good that, at some point, a firm whose experimentation was so far unfruitful, enters the market regardless.

In general, three equilibria are possible, depending on the expected entry cost, the speed of learning, and the firms' patience. If firms are patient, learning is relatively fast, and the expected entry cost is relatively high, then they will experiment and enter only when they have learned about their entry cost. If, on the other hand, firms are impatient, learning is slow, and the expected entry cost is not too high, then they will decide to enter without experimentation. Given more realistic degrees of patience, learning speed, and entry costs, firms will experiment and, if they do not observe their rival's entry within a reasonable time, they will enter the market anyway. Private information plays an important role here: The urge to pre-empt a rival's entry is higher when firms are secretive with regard to their business practices or R&D results, or if they simply cannot communicate them credibly to their rivals than it would be were the results of experimentation leaking to the firms' rivals.
The conclusion is that competition leads firms to invest excessively early and to experiment too little. This is generally good news for consumers, but it is bad news for the firms. As a consequence, we should expect carmakers to have entered the Chinese market prematurely only to discover that this was a mistake.

**COOPERATION**

Our second set of results dealt with the firms’ ability to access the foreign market by forming a joint subsidiary. Competing firms face three sources of inefficiency: market competition; duplication of entry costs; and insufficient experimentation to pre-empt rival entry. Each of these inefficiencies destroys value for the firms and would, therefore, likely be avoided through cooperation. But because what firms learn by experimentation is their private information, they may lie about it. As a consequence such reports cannot be trusted, which makes optimal cooperation difficult to achieve. In the study, we considered two schemes by which firms could seek to reach the cooperative outcome that ensured optimal investment in pre-entry experimentation and which avoided both entry cost duplication and product market competition.

**BUY-OUT: THERE IS A LATEST POINT**

First, we looked at payments made by one firm to another as compensation for staying out of the market. In the real world, a firm could buy out its competitor, or acquire its market-specific investment, taking over the personnel devoted to the new market. We assumed, however, that it was jointly optimal for firms to experiment and learn the entry cost in order to determine the right way to enter the market, and sought to design a compensating payment scheme that gives incentives for the firms to do this. There are two difficulties when it comes to designing a compensating payment scheme that encourages such behaviour. First, when a firm does not observe a competitor enter a market, it becomes less inclined to buy out that rival, and so effectively lowers its willingness to pay for avoiding competition. Of course the rival may well have delayed entering because its experimentation was not yet successful, in which case it would rather continue experimenting than accept a low buy-out offer. It can be shown that at a certain point a buy-out is rendered impossible as the active firm becomes convinced that the rival has dropped its entry plans, and is unwilling to compensate it at a level that would prevent entry.

Second, we found that even within the window of opportunity, firms needed to pay attention to their sharing rule. To achieve efficient entry timing decisions, the monopoly surplus should be shared between the active and inactive firms in an equitable fashion. The share of the active firm – the one taking over – should be large enough to give it an incentive to invest as soon as it learns its cost. The share of the inactive firm – the take-over target – should be large enough to discourage early entry in order to pre-empt its rival.
COOPERATION NO. 2: MEDITATED INVESTMENT

One of the difficulties with the buy-out option arises because firms could not commit not to buy out their rival before successfully completing the experimentation. So, what would change if the firms' buy-out and market entry decisions were mediated by a third party? This scenario is reasonable for young firms that rely on outside financing— for example, from a venture capitalist. With this second scheme, we found that it was possible to implement the cooperative outcome at any point in time, without payments to the inactive firm, as long as the expected payoff is sufficiently high when firms wait to learn their cost.

Our analysis thus sheds light on situations of project selection, where two independent firms run parallel research programmes and a third party can enforce a cooperative scheme to prevent inefficiencies. The third party might be a venture capitalist, for example, or a granting agency running a competing research project. Or it could be the editor of an academic journal, or the organiser of a scientific conference who has discovered that two teams of scientists are working on the same problem. Our analysis suggests that selection should occur neither too early (before the profitabilities of the projects are known), nor too late (when it has become clear that the other firm has not entered). It also shows that the share of the surplus transferred to the firm which is not selected should be neither too large — in which case the selected firm may have an incentive to delay the research project — nor too small. The higher the payoff transferred to the firm whose project is not selected, the smaller the gap between the payoffs of the leading and trailing firms, which reduces inefficiencies due to excess momentum.

SUMMARY

Volkswagen began its exploration of the Chinese market in 1978, and founded its first joint venture with a state-owned enterprise in China, Shanghai Volkswagen Automotive, in late 1984. American Motors, the maker of Jeep, began negotiations to sell its vehicles in China in 1979, and entered the Chinese market with joint-venture partner Beijing Jeep, a Chinese SOE, in early 1984. The fortunes of the two enterprises differed dramatically for many years. While Volkswagen thrived, American Motors faltered, partly due to outdated models, but mostly as a result of clashes in corporate culture.

What Volkswagen had learned in its early, small-scale joint venture, led the company to invest in FAW-Volkswagen Automotive, a large-scale manufacturer that produced thousands of vehicles each day. In 1988 German carmaker Daimler began cooperating with the FAW group to make relatively small numbers of Mercedez Benz cars in China. When it acquired Beijing Jeep through a merger with Chrysler, Daimler decided to use the lessons learned by American Motors, extending the initial 20-year joint venture contract by another 30 years, investing heavily, and transitioning to large-scale production of Mercedes cars in China.

It seems that the initial joint-venture investments by both companies in 1984 were done with little previous learning about how to enter the Chinese market. The later, larger investments were then made only after learning that resulted from the small-scale joint ventures. Our theory suggests that both companies should first have spent more time investigating the optimal way to enter the market. Pre-emptive pressure led them to enter prematurely, and to learn lessons the hard way.

FURTHER READING


KEY TAKE-OUTS

• The outcomes and costs of entry into new markets are inherently uncertain, and firms should devote time and resources to reducing this uncertainty through experimentation.
• If the results of market investigation is not disclosed, as time passes without entry by its rival, a firm will conclude that the rival’s entry costs is prohibitive. This will further reduce the firm’s incentive to investigate.
• With ‘private learning’, the founding of a joint subsidiary can only happen early on because, as time passes by without entry by its rival, a firm becomes reluctant to buy it out.
• When they found a joint subsidiary, firms need to share the fruits of their collaboration in a sufficiently equal way to give incentives for pre-entry experimentation.