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2011-08-01

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Hicks, Colton, "Understanding Entrepreneurial Opportunity via Differentiated Bertrand Oligopoly Market Structure" (2011). *Student Works*. 87.

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Understanding Entrepreneurial Opportunity via Differentiated Bertrand Oligopoly Market Structure

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Abstract:

In this paper we develop a method to be able to recognize opportunity for a new entrant in a Bertrand Oligopoly market based upon industrial organization. We infer from the demand curves of competitors if opportunity for a new entrant exists and the necessary characteristics of the entrant that would make it successful in a given market. This provides a significant contribution to the field of entrepreneurship since it has struggled to find a bona fide way to define and identify opportunity. Most research on entrepreneurial opportunity has focused on the characteristics of the product being developed, e.g., what are the customer needs, do buyer compatible assets exist, is the product easily replicable, etc..., or on the personality traits of successful entrepreneurs such as locus of control, introvert/extrovert, and others. Currently, there is no legitimate model to demonstrate when a *market* presents an opportunity for a new entrant and what this entrant must look like in order to be successful. In this paper we expound a novel method for inferring from competitors' demand curves when entrepreneurial opportunity exists in a differentiated Bertrand oligopoly market and what industrial characteristics the entrant must have in order to compete successfully.

Introduction:

As research on industrial organization and market structure progressed from the “structure, conduct, performance” paradigm of the 50’s and 60’s into the various competitive, oligopoly, and monopoly models of competition that currently exist, researchers began to grapple with new problems. These models described firm behavior and competitive dynamics in new terms that resulted in surprising findings. For example, the undifferentiated Bertrand model of competition yielded the result that only two firms, if completely undifferentiated, would yield the competitive market outcome. Prior to these new descriptions of competitive behavior, the accepted paradigm supported the notion that the structure of the industry, i.e., the number of firms, would ultimately determine the competitive environment. As the new models evolved in mathematically elegant terms, new definitions and descriptions of firms started to emerge such as differentiation, customer loyalty, market power, price sensitivity, and market share. Economists began to grapple with questions such as what is product differentiation? What is customer loyalty? How is it expressed and manipulated in the models? What is market power and how do firms obtain it? Models that explained firm behavior evolved more rapidly than the explanations behind them. The practical application of the models and the corresponding ties to real world firm characteristics were incomplete and underdeveloped. The majority of the work that bridged the divide between applied mathematics and real world behavior of firms fizzled out during the 70’s. Economists were content with the mathematically sophisticated models that explained certain aspects of firm behavior and they delved into new issues. Many questions about what these models really meant and how they apply to competitive markets were left unanswered.

While these models slept, the field of entrepreneurship rose quickly as a new discipline in many universities. The field of entrepreneurship continually researches how to create and harvest value in the marketplace. The majority of the research in the area of entrepreneurship has focused on the value created by the entrepreneurial idea.

Researchers attempt to understand the customers' pain, accessibility of the customer, the amount of capital necessary for starting a venture, barriers to imitation, market trends, competitive advantage, and a firm's capacity to address these issues. Recently, academics have taken hold of economics to try to understand the dynamics of entrepreneurship.

Researchers have begun to investigate ideas such as barriers to entry, cost advantages, price sensitivity of customers, and market size in terms of the various economic models at their disposal. It has been quickly discovered that the current models fall short in their practical applicability to real world entrepreneurial settings. Many firm characteristics are not adequately defined by these models and the variables they use have only hazy interpretations in the real world. This has resulted in a decreasing amount of research that can be done using economics to model entrepreneurship. A new model of common market structure characteristics is needed to advance research of entrepreneurship using economic models.

Lastly, the field of entrepreneurship has struggled with a unified definition of "opportunity." In order for any entrepreneurial venture to be successful, an opportunity must first present itself. How do we identify such an opportunity? Is it based upon the characteristics of the product or service? Does opportunity depend solely upon the tenacity of the entrepreneur? Or is it a function of the industrial organization in which the new firm will compete? While issues regarding the attributes of the product or service and

the characteristics of successful entrepreneurs have been addressed extensively by researchers, the topic of industrial organization as it relates to entrepreneurial opportunity has never been adequately addressed. The ability to study a market, understand the competitors and customers in terms of an economic model, and then decompose this model to extract the various entrepreneurial opportunities that exist would be invaluable to the field of entrepreneurship. Additionally, this new approach would give a novel explanation of the notion of “opportunity” that would fit with a larger, industry wide view of creating a new venture, i.e., when is a market structured such that a new entrant would be successful? Not only would this approach help to understand the competitive dynamics of the industry and if an opportunity exists for a new entrant, but it would help to describe the characteristics that an entrant must possess to successfully compete with the existing firms. By using economic models that approximate real markets, we could begin to derive answers to the following questions : Should the new firm be large or small? Should our product resemble those in existence or should it be highly differentiated? What fraction of the market would we need to attract in order to be successful? How loyal are the customers of our rivals? How difficult would it be to get them to consider a new product? Which firms will likely loose customers the easiest? And what kind of cost advantage or disadvantage could we bear and still remain competitive given these other factors? Understanding opportunity in terms of industrial organization and market structure would place a foundation upon which mathematical and economic models of opportunity can grow and would contribute significantly to the current understanding of entrepreneurship.

Literature Review:

Past research as often acknowledged the issues that we address in this paper but have failed to tackle them in a comprehensive manner. Caves et al. (Caves et al. 1985) addressed the issue that economists have grappled with for a long time: what is product differentiation, really? The authors note that while the idea of differentiation is widely used in economics, an adequate, empirical definition is yet to be developed. While the authors do not attempt to generate a measurable definition of differentiation, the authors conclude that there are observable measurements that seem to confirm the theoretically sufficient conditions necessary for its use in models.

Breit et al. (Breit et al. 1974) suggest that perhaps a better understanding of consumer welfare could unravel the economics of product differentiation. They suggest that a behavioral approach would help to explain why many consumers decide to make very different, yet independently rational, choices, i.e., why consumers prefer different products. They note that customer loyalty is likely a function of psychological variables and conclude that future studies on the psychology of consumers may help to further the understanding of product differentiation.

Peterson et al. (Peterson et al. 1980) points out the present difficulty in establishing an empirical base for the majority of the variables that exist in industrial organization. The lack of theoretical apparatuses that quantify these variables inhibits clear predictions about how firms compete and how a new firm could compete in a given market. The authors also draw parallels between the breakdown of the “structure-conduct-performance” model of the 1950’s and 1960’s and the breakdown of the current models as they grapple with observable firm behavior. All these papers help to emphasize the need

for progress with economic models as they attempt to describe the industrial organization and competitive dynamics of today's markets. The reader will also note that these papers are from the 70's and 80'. After tiring with the practicality of these issues, researchers left the area in search of more theoretically abstract topics and little progress has been made in the area since that time.

Theoretical Development:

An entrepreneur desires to understand the current structure and competitive environment of a market prior to entering so that he can shape his business strategy to exploit the opportunities that a market presents. The structure and competitive dynamics of markets can begin to be understood by incorporating a few key variables into a model. The model developed in this paper incorporates the variables of (1) firm size, (2) customer loyalty, (3) cost advantage, (4) market share, (5) product differentiation, and (6) price into a model that allows for manipulation of these variables to discover what kinds of entrants would be successful in a new market.

Presumably, if no constraint were imposed upon this modeling exercise, we could create some kind of entrant that would be successful in any market if we allocated to him significant advantages in many or all of the dimensions described above. However, we desire to constrain our exercise to the areas of practical application where firms will actually compete and we desire to understand competitive dynamics at the margin. For example, we desire to answer questions such as the following: how much of a cost advantage would be necessary for a firm to succeed if it were to enter a market against an incumbent who is twice his size, with significant customer loyalty, and a moderately

differentiated product? We begin to model opportunity by understanding what is necessary for an entrant to survive in the market. Once we have a picture of what a viable entrant would look like in terms of size, customer loyalty, cost structure, market share, product differentiation, and price, we begin to uncover the transcendent idea of opportunity. Now that an entrant is marginally competitive, what happens if he could gain a small cost advantage over the existing firms? Does he begin to capture significant market share or does this advantage provide only minimal opportunity for increased profits? What opportunity exists in weakening customer loyalty to existing firms? Is it substantial or only marginal?

This technique allows us to determine the type of firm that would be a successful entrant in a new market using 6 relevant and highly controllable dimensions. Once we have elucidated the makeup of these successful entrants, we can identify those entrants that could reasonably be created in the real world given constraints on the capital available for startup, the likely cost structure, and other practical constraints. This gives us a base line for the opportunity that exists in a given market for a new entrant. Could an entrepreneur successfully create one of these firms given the characteristics necessary for success or is the market such that it would be unrealistic to try and create such a firm? After building viable entrants, we can manipulate the various strategic moves available to the firms such as gaining a cost advantage, building customer loyalty, decreasing customer loyalty to other firms, or increasing in size and see what benefit this would yield to the firm. By doing so we begin to understand opportunity in a profound and novel manner that leads firms to make intelligent decisions about how to increase profits given a particular market structure.

In summary, our model allows us to achieve our main objectives of identifying opportunity for a new entrant in a given market, and identifying the characteristics this entrant must possess in order to compete and grow successfully. This adds to the literature by helping the field of entrepreneurship define, identify, and capitalize on opportunity as presented by industrial organization. This novel method provides an empirical backing for much of the intuitive understanding already present about how industrial organization influences opportunity for entrepreneurs.

Works Cited:

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