Entrepreneurial Firms: Who do they compete with and where?

Marc Cowling

Brighton Business School

UK

E-mail: M.Cowling2@brighton.ac.uk

Abstract

Since the work of Schumpeter (1932) outlined the role of entrepreneurs as creators of new combinations of resources there have been many different theories which have attempted to explain why smaller, entrepreneurial, firms exist. Yet many of these theories, particularly those from psychology, entrepreneurship itself, and innovation contradict the standard economic textbook models which view small firms as producers of standard products and services operating in markets approaching the perfectly or monopolistically competitive model or else acting as a competitive fringe in large firm dominated oligopolistic markets. Surprisingly, very little empirical work has tested the obvious questions such as: Are small firms' price-takers in highly competitive markets? Who do they really compete against? What happens if they try and raise prices? Does innovation offer niche market protection from competition? In this paper we tackle all these questions using a large UK data set. Our key findings are that less than 5% of entrepreneurial firms operate in markets where they effectively have no competition and a quarter of all small firms would lose at least a third of their sales if they raised prices by 10%.

1. Introduction

The study of entrepreneurship and entrepreneurial behaviours over the last 40 years has provided some hugely important insights about what entrepreneurial firms do when faced with competition (Dodge, Fullerton, and Robbins, 1994; Lechner and Gudmunsson, 2014; Covin and Slevin, 1989), how their agility can be an asset in times of economic crisis (Bradburd and Ross, 1989), how they can find and defend strategic niches (Papadogonas and Droupokolous, 2004; Bradburd and Ross, 1989), and the decision to internationalise (Brush, Edelman, and Manolova, 2015; Cowling, Liu, and Zhang, 2016). But it has been strangely silent about formally establishing precisely what markets they operate in (other than international or domestic) and the exact nature of competition and prices they face in these output markets. Economics, by contrast, has well established definitions and theories about markets and competition. For example, Robinson (1934) and Stigler (1957) describe the conditions under which perfect competition would exist. Stigler (1964) and Sweezy (1939) define oligopoly. Machlup (1952) describes imperfect competition, and Bain (1956) sets out a context in which barriers to new firm entry exist and hence prevent competition. Chamberlin (1937) describes the theory of monopolistic competition, whilst Baron (1966) sets out the theory of monopoly.

But, since the development of the production function to a large degree excluded a role for the entrepreneur (Cowling, 2003; Niman, 1991), mainstream economics has largely ignored smaller, entrepreneurial businesses from empirical investigation despite a voluminous body of literature concerned with the effects of imperfect competition, barriers to entry, and market concentration on the profitability of large incumbent firms (Bain, 1951; Cowling and Waterson, 1976; Conyon and Machin, 1991; Acs and Audretsch, 1987).

In this paper we will empirically quantify just how many firms operate in competitive markets, how many can compete against large firms, and how many are able to create a genuine market niche through being innovative. In doing so we will adopt the definitions of markets and competition from

standard economic theory to give us a well- grounded theoretical basis and point of reference. We hope that our findings will help to formally establish just how many entrepreneurial firms we are talking about when we discuss different 'types' of business and entrepreneurs. Further, we hope that our results may challenge prevailing orthodoxy in economics, and also mainstream management, which has tended to be in thrall to the study of very large, household name, industrial conglomerates (Pelham and Wilson, 1996).

2. The Theory of Markets and Competition

There are 4 major types of competition and markets considered in economic theory, namely perfect competition, monopolistic competition, oligopoly, and monopoly. Each has a formal framework which is defined in terms of information (knowledge) of firms and consumers, ease of entry into (and out of) the market, the uniqueness of the product or service, the ability of a firm to influence market price, the number of firms in the market, the presence of externalities (potential benefits to third parties not directly involved in a market transaction), and the level of profit. We will briefly discuss the key elements of each type of competition and market so that we can classify our sample of real entrepreneurial small firms into one of the four classic competitive market structures.

2.1 Perfect competition

A perfectly competitive market is, in many ways a theoretical benchmark market where competition is at its highest. Under conditions of perfect competition, consumer welfare is at its highest. The key assumption is that there is perfect knowledge on both the producer and consumer sides of the market and the accumulation of knowledge is costless. For our purposes, this means that the ability of entrepreneurs to pursue risky activities is extremely limited. Building on from this perfect knowledge, all market players are assumed to act rationally and in their self-interest. On the

producer side of the market, there are no barriers to entry (or exit) and each firm produces homogenous output. Firms are price-takers and cannot influence the prevailing market price. Hence there is no incentive to raise or lower prices. This market is characterised by many firms as there are no barriers to entry and each firm can only make *normal* profits in the long-run. If there are above normal profits available, and these are observed by other outside firms, then free entry drives the price back to its long-run level.

Under perfect competition, many potential benefits would exist. Firstly, there is no information asymmetry hence no privileged information which would benefit either party in a transaction. Secondly, there is no opportunity for firms to derive market power and create supra-normal profit, through for example, advertising. Finally, there is maximum allocative and productive efficiency and consumers in the market have the widest choice of sellers possible. Of course, all of the key assumptions of the theory can be challenged, specifically perfect information, the existence of identical products, and the ability of consumers and firms to act rationally.

Next we present the three main models which economists refer to under the broad classification of imperfect competition. The first is monopolistic competition.

2.2 Monopolistic competition

The model of monopolistic competition describes a market in which firms have many competitors, as for perfect competition, but each producer sells a slightly differentiated product. This allows a more fine-grained, and possibly realistic, approach to defining a market where sellers of a similar product each have the possibility of differentiating their product from those offered by their competitors. An example would be a typical high street with a number of small independent cafes. They all sell coffee and sandwiches, but each has a unique offer which is apparent to potential customers. But importantly, their potential customer base is the same, people who are looking for a coffee or sandwich.

On the seller side of the market, each seller chooses its pricing strategy and output level based on the size of the market and its individual cost base. Information in the market is widely dispersed amongst participants, but is not perfect. No agent knows everything. In a monopolistically competitive market there is a role for the entrepreneur as she has to make choices about pricing and output and operates without full market information. However, it also retains some elements of the perfectly competitive market as there is free entry and exit. The firm can differentiate its offer in several ways, including the physical features of its product, the way in which it markets its product, the type of people it employs, and the sales channels it operates.

Because each firm can differentiate its product, it follows that firms are price-makers and they can choose the price they offer their products to the market at. But the firm also faces a downward sloping demand curve, hence the pricing decision has a direct impact on demand from consumers. Advertising has a role, given that with many competitors each firm needs to convey to potential customers how unique their particular offer is. Finally, the entrepreneur is assumed to seek to maximise profit. In the long-run profits tend towards their perfectly competitive level, but existing firms continually seek to establish the uniqueness of their offering to maintain prices above the competitive level, even in the presence of new entrants. The obvious advantages of monopolistic competition are ease of entry of new firms and a wide choice of differentiated products available to the consumer. The potential disadvantages are wasteful expenditure on advertising and marketing and a more widespread tendency towards productive inefficiency as all economies of scale are not exploited.

2.3 Oligopoly

The theory of oligopolistic markets moves away from perfectly and monopolistically competitive markets, where large numbers of similar producers are present but each has little market power, towards a market in which a few large firms dominate, although there can also be large numbers of small firms. In the UK banking industry, for example, there are more than 40 banks operating, but the big-4 have a market share of customer accounts and lending of around 80%. This market concentration ratio is often used by economists and competition authorities to identify oligopoly.

Focusing on the small number of dominant firms in an oligopolistic market, here firms' decisions are not made independently of one another, as was the case under more competitive market scenarios. When a dominant firm makes it strategic choices, it must also consider potential reactions from other dominant firms. One particularly interesting choice dominant firms face is whether to compete with their main rivals or collude with them. Pricing decisions are also an important strategic choice. Equally, the decision to pursue a new market strategy can give the firm a first-mover advantage, but can also allow other firms to pursue countervailing strategies which undermine them, such as developing a better specification product.

Under oligopoly, a firms' dominant position can be maintained through the presence of barriers to entry which give incumbent firms a cost advantage over potential new entrants. The obvious one being economies of scale. New firms are unlikely to enter and attract enough customers to lower their per-unit costs to the level of larger incumbent firms. Equally, many of the costs of market entry are sunk and non-recoverable thus new entrants have to make large investments which are lost if they subsequently exit the market. Further, incumbents with large resource bases can temporarily lower prices in order to drive new entrants out of the market.

2.4 Monopoly

The purest form of monopoly is when there is a single firm in the market. Competition authorities adopt a more relaxed definition and consider that a firm has monopoly power when it controls 25% or more of a defined market (Competition Commission, 2016). There are several specific conditions under which a monopoly can occur. These include; (a) a monopoly position being awarded to a single supplier by a government, (b) a situation in which one firm has exclusive ownership of a scarce resource, and, (c) where a firm has an exclusive legal right to sell its output through a patent or copyright.

Under monopoly, there is no competition present in the market so firms can maintain profit levels well above the competitive rate. Where no close substitutes are available, this monopoly power is at its greatest. Where there are significant economies of scale present in production, a case can be made that monopoly can be efficient as it avoids inefficient duplication by other firms. There is also an argument to be made that as long as the excess profits derived are channelled back into R&D then there are innovation benefits. But this is contestable if shareholders simply distribute the excess profits. On the consumer side of the market, the lack of choice and above competitive prices reduce consumer welfare. The lack of competition itself can lead to a tendency to productive and allocative inefficiency as owners face no pressure to follow a cost minimisation strategy.

Table 1 summarises the key features of the four most common market structures we have described above. Specifically, we outline how many firms operate within each type of market, whether there is ease of entry and exit (barriers to entry), the level of competition, and the ability of the firm to set its own prices or accept the exogenously determined market price.

Table 1: Summary of the characteristics of different market models

	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
Number of firms	Large	Many	Few	One
Barriers to entry	None	None	High	High
Size of competitor firms	Small	Small	Large	None
Common characte	ristics of market stru	cture		
Product differentiation	Homogeneous	Differentiated	Differentiated	Single product
Market power	Price taker	Some price setting ability	Price setter	Price setter
Shape of demand curve				

Source: Department for Business, Innovation and Skills (2016) SME Lending: An International Comparison of Markets. DBIS Research Paper No.270. London.

3. Data and Methodology

In this section we describe the data we have available to us and the way in which we generate empirically testable hypotheses for distinguishing between firms operating in different types of markets. This study uses data from a UK government sponsored SME survey. Telephone interviews were conducted by OMB (A specialist survey company) during August to September 2008 with a sample of businesses drawn from with the general SME business population. In total, 1,488 businesses were surveyed. The survey was designed to collect information on growth and market displacement amongst SMEs and, more generally, data on growth orientation, employment and sales growth, product and process innovation, and entrepreneurial and top management team characteristics such prior labour market history, formal qualifications, and entrepreneurial experience. Further data was captured relating to competition and innovation. The precise survey questions of relevance to competition, markets, and innovation are described below.

How would you describe the nature of the competition in your main markets? Would you say that there is...? READ OUT. SINGLE CODE.

Very intense competition	1
Intense competition	2
Moderate competition	3
Weak competition	4
Or no competition at all	5

If your business were to cease trading tomorrow, do you think any of your competitors would take up your current sales over the next year?

Yes, all of our sales1	
Yes, some of them2	
No, no-one would take up our sales	

And are your main competitors mostly...?

- Small firms with less than 250 employees 1
- Or large firms with 250 or more employees 2
- Both small and large firms 3

Now thinking specifically about your <u>own</u> prices, if you were forced by cost increases to <u>raise</u> your prices by 10%, to what extent do you think this would impact on your sales? Would your sales be...?

Please assume that your competitors' prices remained the same

The same	1
Up to 10% lower	2
11 - 20% lower	3
21- 30% lower	4
Or, more than 30% lower	5
Higher	6

In the last 2 years, has your business introduced any new or significantly improved <u>products or</u> <u>services</u>?

Yes, <u>new</u> products or services	1
Yes, <u>improved</u> products or services	2
Yes, both	3
No	4

Are these just new to your business or are they completely new, and by that I mean that to the best of your knowledge they have not been introduced by anyone before you?

Just new to the business	1

Completely new	/	2
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And still thinking about the last 2 years, has your business introduced any new or significantly improved <u>processes</u> in this time?

Yes, <u>new</u> processes	1
Yes, <u>improved</u> processes	2
Yes, both	3
No	4

Thinking about the types of technology you <u>currently</u> use in your business, would you say that any of this technology could be considered to be 'cutting edge'?

By cutting edge, I mean technology which is novel or not widely used in your industry sector.

Yes......1 No.......2

Empirical Measures and Tests of Market Structure and Competition

Intensity of Competition – How intense in the competition in the market? The more intense the more competitive the market

Direct Competition – what is the size of firms' competitors? Small = perfectly competitive or monopolistically competitive, large = oligopoly, both=oligopoly

Prices and Competition – demand curve effect: price rises lose more sales the more competitive the market is as consumers substitute into competitors' products

Differentiation and Competition— innovation is the most common means of creating a differentiated offer. The more innovative the firm the lower the potential for other firms to develop close substitutes

Differentiation and Competition – If the firm was to cease trading how much of their sales would be taken up by competitors? Higher take-up indicates higher competition

Differentiation and Competition – If the firm was to cease trading would their sales would be taken up by small or large firms or both? Small = perfectly competitive or monopolistically competitive, large = oligopoly, both=oligopoly

Survey Question	Perfect Competition	Perfect – Monopolistic	Monopolistic Competition	Monopolistic Competition	Oligopoly	Monopoly
		Competition		- Oligopoly		
How would you	Very	Inte	ense	Moderate	Weak	No
describe the nature	Intense					competition
of the competition	(24.95%)	(32.	10%)	(31.96%)	(6.80%)	(4.19%)
in your main						
markets?						
If your business	ļ A	All		Some		None
were to	(52.	53%)		(34.79)		(12.68%)
cease						
trading						
tomorrow,						
do you						
think any of						
your						
competitors						
would take						
up your						
current						
sales over						
the next						
year?						
Aro your main		Small	1	Poth		
compositors		5111all		(22.26%)	La (15)	18e
mostly ?		02.0176)		(22.3076)	(13.)	5576)
If you were forced	Minus	Minus	Minus	Minus	Same	Higher
hy cost increases to	>30%	21-30%	11-20%	<=10%	Sume	riighei
raise your prices by	(11 22%)	(7.64%)	(14 50%)	(22.99%)	(39.20%)	(4 44%)
10% to what extent	(11122/0)	(7.0.170)	(1.1.5070)	(22:3376)	(0012070)	(,
do you think this						
would impact on						
your sales?						

Table 2: Mapping Empirical Survey Questions to Market Structure and Competition

From Table 2, we observe that the precise measure adopted to distinguish between the four classic markets is extremely important in terms of allocating each individual firm to a particular market structure. On monopoly, we have more consistency across measures with similar estimates of 4.19% and 4.44% of firms respectively across our intensity of competition measure and our price measure. But the market exit (cease trading) measure gives a higher estimate of 12.68% of firms. Focusing on the two most competitive market structures, perfect and monopolistic competition, we get common estimates in the range of 52% -62% of firms across several measures.

But we are also interested in what types of firms operate under different market structures and hence face quite different competitive pressures. To resolve these questions we estimate a series of econometric models using the 4 market definition questions described above using a vector of firm and entrepreneur demographic variables. As all four of our dependent variables (competition intensity, competitor take-up if firm exits the market, competitor size, and the price elasticity of demand) are ordered and categorical, we estimate these models by ordered probit. The general form of each model is thus;

Firm Characteristics

Entrepreneur Characteristics

Y = f ((Age, Size, Industry, Region, Technology, Innovation) + (No. of Directors, NEDs, Entrepreneurs Formal and Informal HC))

4. Empirical Results

In this section we discuss our empirical findings based on our four market competition models. Having already established the distribution of firms across types of markets against the four measures, we are seeking to understand more about how firm and entrepreneurial characteristics might shape the nature of this distribution of firms across types of market structure. The first model we consider relates to the intensity of competition faced by the firm in their core market.

4.1 Intensity of Competition

We observe (Model 1) that there is no significant firm size effect on the intensity of competition a firm faces. Micro, small, and medium sized firms are equally likely to face low (high) competition in their core markets. But there is a firm age effect, with older firms facing more intense competition. That is to say that the older a firm is, the more likely they are to be operating under conditions of

perfect or monopolistic competition. Younger firms appear more able to shelter themselves from external competition which offers support for the protected niche hypothesis. There were no effects apparent in respect of technology adoption or offering innovation products and services. This suggests that there are similar levels of competition in technology and innovation driven output markets as there is in markets for more conventional products and services.

Firm level productivity does have a significant impact on the ability of a firm to protect itself from competition. Here the more productive a firm is, the lower the intensity of competition it faces in output markets. This is consistent with a cost-advantage discouraging new market entry on the one hand, and forcing inefficient firms to exit. There are also some identifiable spatial effects. The two most competitive regions of the UK in terms of greater intensity of competition are London and the wider South East. These are the wealthiest regions by a distance in the UK. This may suggest that in high wealth and income regions consumption demand is higher and this encourages firms to compete with each other with a greater degree of intensity, as well as encouraging new firms to enter to grab a share of a buoyant output market. At the industry level, we find that construction firms, on average, face more intense competition than their peers in primary, manufacturing, and service related industries.

In respect of entrepreneurial characteristics, we find that firms with higher levels of internal and external human capital available to them are more capable of protecting themselves from market competition. Specifically, collective human capital arising from larger sized boards of directors, and an external human capital input from a Non-Executive Director (NED) is associated with less intense competition. The actual process by which this occurs is worthy of further research, but is consistent with more talented entrepreneurial teams being able to find and locate protected market niches (Bradburd and Ross, 1989), or as Porter (1980) protected spatial niches.

4.2 Take-Up of Market Share if Firm Exits

A lower take-up of market share by other firms in the event of a firm exiting the market is indicative of imperfect competition and a heterogeneous product or service offering by the exiting firm such that it is difficult for other firms to provide similar products or services that satisfy consumers of the exiting firm in that market. We observed previously (Table 2) that 52.5% of firms would have their sales completely absorbed by other firms within a year of exit, consistent with a perfectly competitive market, but also that 12.7% of firms would not have their market output replaced by other firms, which is consistent with an imperfect market structure and a highly differentiated product or service offer.

Here again (Model 2) we do not observe any firm size effects, nor a firm age effect. Firms that undertook incremental innovations to their offering were more likely to have their market share taken up by other firms, but there were no productivity or industry level effects. However, there were a number of significant geographic region effects suggesting that spatial markets are important in this context. Out of the 12 core UK regions (including Greater London), it was the case that in seven regions firms faced the possibility that their entire market would be taken up by other firms within twelve months in the event of their exit. This implies that output markets are more competitive in these regions. The most competitive regional market was Northern Ireland where incumbent firms were the most likely to have their sales absorbed by other firms. Other more competitive regional markets include London, West Midlands, Yorkshire & Humberside, and to a lesser degree South West, South East, and North West. As there are wide economic disparities across these regions, this does not seem to be associated with wealth and income differences. One potential factor could be relative differences in spatial costs of serving particular markets.

There were no entrepreneurial effects evident across our basket of entrepreneur and human capital measures. This might suggest that market forces are restricting the ability of entrepreneurs to sustain a competitive advantage through strategic measures in the long-run.

4.3 Size of Competitors

In a general sense, the smaller the size of the competition in a market, the more competitive a market is. Here small firm dominated markets would approximate that of a perfectly or monopolistically competitive market structure. Large firm competition implies an oligopolistic or at the extreme a potentially monopolistic market structure. Model 3 shows that firm size and age do not allow us to differentiate between firms in terms of the size of their core competitors. In this sense, micro, small, and medium sized firms, and younger and older firms, are equally likely to face small or large firm competition, or indeed a mix of both. Technological sophistication was a differentiating factor, with firms at the higher-technology spectrum being more likely to compete with larger competitors. This suggests that technology adoption allows firms to offset, to a degree, the disadvantages of smallness and youth. But this did not extend to product or service innovation, or indeed to underlying productivity.

Whilst there was a single spatial effect, with firms in the East being more likely to face large firm competition, no entrepreneurial effects were found to be significant. This might suggest that the precise nature of the competition a firm faces in its output market is fairly random, or at the minimum not able to be captured by the data available in this study. Recent empirical work looking at strategic market decisions of SMEs (Cowling and Liu, 2017) found that the preferred form of growth is through expansion within existing markets, and that a facing large firm competition in that market was a major driver of that decision. This suggests that smaller firms tolerate large firms

operating within their output markets, as they do all other size classes of firm, as there will always be an opportunity to expand when the overall market is growing. Oligopoly theory explicitly allows for the presence of a small, competitive fringe as the large dominant firms leave gaps for them to fill.

4.4 Price Elasticity of Demand

Here we test what the potential demand effect is if the firm faced a 10% increase in their unit production costs. The less demand is eroded, given the own-firm cost increase, the more imperfect (uncompetitive) the market structure is perceived to be. To our knowledge Reid (1993) is the only small firm scholar to have explicitly sought to trace out the small firms demand and cost curves by adopting an innovative graphical face-to-face show card approach. On firm size effects (Model 4), there are none apparent. But the results show that older firms, facing a cost increase, are likely to have a greater share of their sales eroded. This implies they face more competitive markets than younger firms. This is consistent with our competition intensity findings. Technology adoption and incremental innovation were found to reduce the rate at which sales are eroded given a cost increase, suggesting they both act to reduce competitive pressure in the output market. Again, as in our competition intensity model, we observe that more productive firms are better able to protect themselves from external competitive pressures, and, here, to mitigate these cost effects.

Spatial effects were also evident suggesting that markets have an important regional aspect to them. Here we find that firms located in the East Midlands and South West, and to a lesser degree those in North West and Yorkshire & Humberside, are likely to experience a lower rate of erosion of their market sales given a price increase. In magnitude these spatial effects are quite large which reinforces their relative important in terms of impacting on the price elasticity of demand.

5. Conclusion

We set out to formally classify a representative sample of UK SMEs into four classical market structures identified in formal economic theory, namely perfect competition, monopolistic competition, oligopoly, and monopoly. Having allocated our sample of firms into one of the four categories of market, where possible, using four formal measures related to intensity of competition, size of competition, erosion of market sales on exit, and price elasticity of demand, we then sought to shed more light on what the driving factors are that influence which firms face each of the alternative types of market. This is important as the nature of the market and competition a firm faces largely determines how efficient they have to be in the first instance, even to ensure basic survival, and how much profit they are able to make.

Our study was inspired by theoretical assumptions, particularly in neoclassical economics which largely excludes the entrepreneur *per se*, and industrial economics, which largely confines smaller firms to small, local markets and assumes that they operate in fairly standard product markets and compete amongst themselves for the scraps left by large dominant firms. It was equally inspired by a large body of the entrepreneurial literature which tells us a lot about how firms can deviate from their role as assumed by many economic theorists, but tells us very little about the actual and relative distributions of smaller firms within different market structures, and the implications of being in a specific type of market.

Whilst the precise allocation of firms to rigid market structure classifications was imperfect, we are fairly confident in stating that between 50% and 60% of SMEs would operate under conditions of perfect or monopolistic competition. That is to say that they produce fairly similar products or

services to their small firm competitors and are unable to sustain excess profits in the long-run as new firms can enter their market and erode profit levels back towards the competitive equilibrium. There is also pressure on costs and any increase over and above that of competitor firms would lead to a significant loss in sales. At the other extreme, between 5% and 12% of SMEs are operating as actual or virtual monopolists in their core market with very little competition or cost pressure.

In terms of what types of SME operate under which type of market structure, we consistently found that firm size class *per se* was not a defining factor. But there was evidence that older firms found it more difficult to protect themselves from competition. Utilising state of the art technology was also associated with lower competitive pressures but also large firm competition. Incremental innovation was more likely to be associated with more competitive market structures. Consistent with standard economic theory, we do find that more productive firms are more likely to operate in less competitive markets, those assumed to be dominated by large firms, suggesting that the efficient smaller firm can compete even when significant barriers to entry are present.

There was some evidence that entrepreneurial talent, measured by human capital, did allow some smaller firms to position and sustain themselves in less competitive markets. In this sense, the entrepreneurship literature has been heading in the right direction in exploring how this is achieved and enabled by entrepreneurial inputs to the smaller firm. But our findings are only strong in relation to the breadth of human capital available to the firm, not the individual experience and talent of the entrepreneur *per se*, the depth of human capital.

What was clearly apparent was that spatial context is very important in the determination of the types of competitive pressure a firm faces and the presence of close substitutes for products and

services. And this is often, but not exclusively so, not related to the relative wealth of particular regions, but other region specific characteristics. Whilst the study of spatial markets has a very long tradition in economics (see Hotelling, 1929, on spatial competition, Salop, 1979, on outside goods price effects, and Panzar, 1980, on contestable markets), this body of theorising, particularly recently, has been largely used to identify and explain why competition in markets is easily eroded and how to measure monopoly power in anti-trust cases.

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Table 3: Regression Model of Market Structure and Competition

	Model 1 Competition Intensity		Ν	Model 2			Model 3			Model 4			
			Sales Erc	sion After Ex	it	Com	oetitor Size		Price Elast	Price Elasticity of Demand			
	Hig	High to Low		Hig	High to Low			Small to Large			Low to High		
	coeff	Z	Pr>z	coeff	Z	Pr>z	coeff	Z	Pr>z	coeff	Z	Pr>z	
Firm Characteristics													
Size Class													
Small	-0.0181	-0.1100	0.9090	-0.0005	0.0000	0.9980	-0.0418	-0.2300	0.8210	0.0382	0.2300	0.8180	
Medium	0.0002	0.0000	1.0000	-0.4045	-0.7900	0.4270	0.4017	0.8800	0.3790	0.0343	0.0800	0.9370	
Firm Age	-0.0079	-2.6000	0.0090	-0.0028	-0.9800	0.3260	-0.0011	-0.3100	0.7530	0.0044	1.6900	0.0910	
High-Tech	0.0471	0.6700	0.5020	0.0812	1.0000	0.3180	0.2435	3.0100	0.0030	-0.3273	-4.4200	0.0000	
Innovation													
Incremental	-0.1465	-1.4000	0.1600	-0.2727	-2.2200	0.0270	-0.0818	-0.6600	0.5080	-0.2785	-2.5000	0.0120	
Radical	0.0175	0.2100	0.8330	0.0617	0.6500	0.5160	0.1191	1.2400	0.2160	-0.0075	-0.0900	0.9310	
Productivity	2.23E-10	2.0700	0.0390	-3.76E-11	-0.3100	0.7580	-1.76E-10	-1.3800	0.1690	-3.55E-10	-2.9600	0.0030	
Industry													
Construction	-0.4321	-3.3300	0.0010	-0.1788	-1.2200	0.2230	0.1760	1.1500	0.2500	0.0252	0.1900	0.8520	
Services	-0.1377	-1.2600	0.2070	-0.1350	-1.0900	0.2770	0.1829	1.4000	0.1600	-0.0069	-0.0600	0.9520	
Entrepreneurial Characteristics													
Board Size	0.0467	2.2900	0.0220	0.0078	0.3400	0.7360	-0.0258	-0.5800	0.5590	-0.1242	-3.2600	0.0010	
NED	0.3729	3.3400	0.0010	0.0408	0.3200	0.7530	0.1051	0.7900	0.4290	0.0349	0.2900	0.7710	
Years business experience	-0.0114	-0.5900	0.5580	0.0241	1.0900	0.2770	0.0265	1.1600	0.2450	0.0269	1.3100	0.1910	
plus region + market	Yes			Yes			Yes			Yes			
n ohs	1 271			1 160			1 229			1 130			
Log Likebibood	1 670 22			1 070 85			1,225			1 725 69			
LOP FIVEHILIOOD	-1,070.32			1,075.05			1,030.00			1,723.00			
cut 1	-1.0012			-0.3388			0.8979			-2.1795			

cut 2	-0.1120	0.8050	1.6983	-0.5318
cut 3	1.0707			0.0717
cut 4	1.6103			0.4628
cut 5				0.8441