On the size distributions of firms and markets

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Abstract

Two weak restrictions on equilibrium market structures are that firms who decide to enter make sufficient profits to cover entry costs and fixed costs of production, and that no new firm could profitably enter. I examine these restrictions by the size distribution of firms in the same industry, but who compete in different geographical markets. The industry is characterised by small exogenous entry costs, comparatively large fixed costs of production, negligible efficiency differences, and primarily spatial product differentiation. The inherent symmetry of conditions results in a strong tendency towards equal sized firms *within* markets. Market structures with many small firms are never observed and rarely are those with a few large firms, thereby illustrating the bite of the two restrictions. Finally, I show that a skewed size distribution of firms at the industry level can be explained by an underlying skewed distribution of market sizes.

Key words: Size distribution of firms; market structure; market size; exogenous sunk costs; spatial product differentiation; driving schools.
JEL codes: L11; L84.

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1. Introduction

One empirical regularity of industries is that the size distribution of firms is skewed (e.g., Schmalensee, 1989, Sutton, 1997a). The skewness has been attributed to various factors such as efficiency differences, product differentiation, and ‘pure chance’. In the first part of this paper I examine the importance of market size on the size distribution of firms in the Swedish driving school industry. At the industry level the size distribution displays positive skewness; many small firms and a few large ones. To what extent is the industry pattern explained by an underlying distribution of market sizes where firms compete?

Many oligopoly theories predict a relation between market structure and market size. A standard two-stage model is a useful illustration. In the first stage *ex ante* symmetric firms are free to enter a market subject to some exogenous sunk entry costs, and the second stage competition involves at least a minimum of product differentiation. The equilibrium number of firms in a market will depend on the magnitude of sunk costs and the intensity of post entry competition. The prediction is that more firms will enter if the market size is large. When firms have an option to spend resources to differentiate their products the tendency towards fragmentation tends to break down, giving rise to a non-monotonic relation between market size and market concentration, Sutton (1991, 1998). Additional tests on samples of exogenous and endogenous sunk cost industries have supported the predictions, Robinson and Chiang (1996). Under the assumption that firms within a market are symmetric, Bresnahan and Reiss (1991) argue that the relation between market size and the number of firms can be used to test how the intensity of competition is changing with the number of competitiors. In the second part of the paper I use the size distribution, together with some prior knowledge of this simple industry, to provide evidence on the strength of the tendency for exogenous sunk cost industries to fragment, and to contain firms of the same size.

The driving school industry is easily described. Competition takes place in regional markets and firms can freely choose their location. To enter, a firm needs to incur some sunk set-up cost, for example the time and cost it takes to start and register the firm. In addition to this, the firm needs some minimum fixed costs; office space and at least one car. The fixed costs in office space and cars accrue in each period the firm is active but can to a large extent be recouped if the firm decides to scale down or exit. The overall degree of product differentiation in the industry is relatively minor. Spatial product differentiation arise in that consumers have a preference for driving lessons offered in their neighbourhood (near their home, school, or work). Possibly, driving school teachers characteristics yield some degree of product differentiation. The potential for endogenous product differentiation by spending on advertising, attractive new cars, or high quality teachers appears to be limited.

Sutton's (1997b) two basic principles governing the equilibrium configurations are viability and stability. These restrictions can be used to derive predictions on market structure, even without assuming a specific entry pattern (sequence of moves) and that all firms being perfectly rational. The viability restriction rules out configurations where one or more of the active firms' gross profits are not covering the sunk entry costs and fixed costs of production. The stability restriction ensures that if there is a profitable opportunity to enter the market there is 'one smart agent' who will exploit it. The viability restriction has its bite on markets structures with 'too many' firms, and the stability restriction on market with 'too few' firms.

In very small markets there will be insufficient demand to make a monopoly firm viable (cover the sunk set-up costs and the minimum fixed costs). At some critical market size there is room for one small firm (office plus one car). Over a range of market sizes above this, the monopoly structure remains the only viable, and therefore the monopoly will grow to meet demand. At some greater market size there will be demand to allow two viable firms, and from the stability restriction there is some firm that will pick up the opportunity to enter. Up to some new critical market size above this, either one or both firms will grow (expand capacity) to supply the market.[1] Eventually, however, the market size is large enough to support a third firm, and so forth.

The pattern described above rests on the distinction between sunk costs and fixed costs. Had the fixed costs in office space and cars been sunk costs we would anticipate a more complex pattern, given that the market history is unobservable. For example, an initial small monopoly could gradually add capacity as the market grows in order to preempt new entry. When the fixed costs of production can be recouped such preemptive strategies are ineffective: in case of entry by a new firm the incumbent's best response is to sell off some capacity. Thus, a finding of symmetry in firm sizes is evidence that fixed (non-sunk) costs have no commitment value.

[1] One complicating feature of the industry is that capacity can not be adjusted smoothly; increments are by car. Competition when capacity is lumpy has been examined in many papers (see Gilbert, 1989, for a review). Cabral (1995) models a situation where competitive firms pay a fixed cost of entry and additional cost of capacity in a growing market. He showed that, in steady state, the smallest firm will introduce the next capacity unit.

2. Market

The sample consists of all active driving schools in 250 Swedish regional markets, of which 196 markets contain at least one firm. A market is defined as a municipality, organised around one town, where (with very few exceptions) all the driving schools are located.[2] The population of age 16-24 in the municipality, *MSIZE*, is one crude predictor of market size (demand). The data sources and regional markets have been described in Asplund and Sandin (1998a, 1998b).

Driving schools are generally small businesses. The register roll of the interest organisation (covering roughly 95 percent of all driving schools) was used to check whether a driving school was part of a group under common ownership. I found that a gasoline retail chain controlled four, about ten owners controlled two, while the remaining owners each controlled only one driving school. Here, each driving school is treated as a separate entity (henceforth referred to as a firm).[3] The number of firms in a market is denoted *FIRMS*. The measure of firm size is the number of cars it operates, *FCARS*, which is easily observable and will be highly correlated with other measures such as firm revenue.[4] The number of cars in the market is denoted *MCARS*.

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[2] The three largest cities (Stockholm, Gothenburg, and Malmoe) with surrounding suburb municipals are not in the sample. In these areas a municipal does not define a market as the cities consist of many submarkets, and well-developed public transport makes it difficult to delineate market boundaries for the suburbs. Some evidence presented below suggests that even the largest markets in the present sample contain submarkets.

[3] Treating driving schools under common ownership as one firm would yield a slightly more skewed size distribution at the national level than the one depicted below. The distribution at the market level, however, is unaffected as no owner operates more than one driving school in any market.

[4] There are alternative measures of firm size. The data set includes information on the number of teachers in the driving school. The problem with employees as a measure is that many driving school

Occasionally, *FCARS* and *MCARS* refer to firm and market production capacity, respectively. *FCARS/MCARS* is the market share measure used to construct the Herfindahl index of market concentration within a market *i* as

$$HERFINDAHL_i = \sum_{k=1}^{FIRMS_i} (FCARS_{i,k} / MCARS_i)^2 .$$

HERFINDAHL will be compared to its minimum value, 1/*FIRMS*.[5]

Figure 1 shows the size distribution of firms at the industry level. The distribution is skewed to the right (skewness=0.92) as is commonly found in studies of firm size distributions, Schmalensee (1989, p.994). It is argued that the size distribution at the industry level is due primarily to aggregation effects, and not that large firms are more efficient (Jovanovic, 1982) or spend resources to differentiate their product (Sutton, 1991). The argument runs as follows: The industry contains many markets and each firm competes only with a small subset of all firms; the firms active in its market. The underlying distribution of market sizes is skewed (skewness=2.50). Firms within the same market are of approximately the same size, as shown in the next section. Firm size and market size are positively correlated (0.18): firms in large markets tend to be bigger than those operating in small markets.[6] Hence aggregating firms that are not all competing with each other can give rise to a skewed size distribution of firms due to an underlying skewed distribution of market sizes.

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teachers work only part time to cover periods with temporary high demand. Accounting measures (e.g., revenue, asset value) are available only for limited liability companies.

[5] Due to the integer nature of the size measures, *1/FIRMS* (weakly) underestimates the lower bound. The lower bound in the case, for example, *MCARS*=3 and *FIRMS*=2 is 2/3 and not 1/2.

[6] Asplund and Sandin (1998b) found the per firm market size to be increasing in the number of firms while the market size per car was decreasing in the number of cars. These findings support the claim that firms tend to be bigger in large markets.

FIGURE 1 ABOUT HERE

3. Market structures

Table 1 shows a cross tabulation of the variables *FIRMS* and *MCARS* for markets with 20 or fewer cars. For each cell, the average of *MSIZE* and *HERFINDAHL* are reported.

TABLE 1 ABOUT HERE

FIRMS and *MCARS* are both strongly positively correlated with market size, as seen in the bottom five rows and last column in Table 1.[7] More interestingly, *HERFINDAHL* displays a strong negative correlation with *FIRMS* as well as *MCARS*. This finding is further strengthened by noting that in each column *HERFINDAHL* is relatively constant and close to the most fragmented market structure (the limiting ratio 1/*FIRMS* where all active firms are of equal size). It is not a trivial observation as it is quite possible that large markets would be dominated by a few firms (possibly with a fringe of small firms), and thus have a high market concentration. This is clearly not the case here.

[7] The number of consumers is not the only determinant of *FIRMS* and *MCARS*. Asplund and Sandin (1998b) controlled for other factors that might influence demand (for example, average income and distances to the closest markets where there are other driving schools) and costs (wage level and cost of office space). Such factors can partly, but certainly not fully, explain some of the odd observations in Table 1.

The difference between *HERFINDAHL* and 1/*FIRMS* is relatively greater for the largest markets. Note also that in bottom row in Table 1 average firm size is non-monotonous (increasing up to seven firms and weakly decreasing thereafter). The pattern suggests that there are submarkets within the largest markets. For instance, outside the centre there may be enough demand to make small 'monopolies' viable, at the same time as firms competing in the centre are larger. Thus, the observed size distribution may be indicative of a break down in the market definition for the largest markets, rather than the effect of endogenous investments in product differentiation explored in Sutton (1991).

To examine the relation between market production capacity and the observed number of firms in the market, consider the distribution of *MCARS* conditional on the value of *FIRMS*. Focusing on markets with four or fewer firms, it is immediately clear that there is a broad range of *MCARS* for any given number of firms. The smallest monopoly markets consist of only one car whereas the largest has six cars. Likewise, $MCARS \in [2,13]$, $[4,14]$, and $[7,19]$, for duopolies, triopolies, and quadropolies, respectively. The key point, however, is that some market production capacities are more likely than others are, and some *a priori* possible structures are never observed at all. Even though there are monopolies with five and six cars, together they only make up four percent of all monopolies. Monopolies with one or two cars are far more common and each account for approximately forty percent of the monopolies. Similarly, there exist duopolies with two and thirteen cars, but they are less common than duopoly markets with three to six cars. Market structures that are never observed are monopolies (duopolies) with seven (fourteen) or more cars. That large firms in markets with few firms are unlikely is evidence of the power of the stability restriction: new entry can not be prevented. The other type of market structure that is never observed, in markets with three or more firms, is *FIRMS=MCARS*. This suggests that post entry competition and the viability restriction is at play. As there are many one-car monopoly firms, and a few duopolies where each firm has one car, we know that one car can be sufficient to cover set-up costs and fixed costs. With three or more one-car-firms, post entry competition reduces profits per car to the extent that they are non-viable.

One could argue that the existence of *any* monopoly with five or six cars establishes a violation of the stability restriction. There are two counter arguments to this line of reasoning. First, all firms are not required to be perfectly rational as long as they are not loss making. For example, a 'too large' monopoly may have over capacity (in the sense that it could increase its profits by cutting capacity) in a market where a duopoly could not be viable. This argument, however, is unlikely to be valid in the driving school industry where fixed costs of cars are high relative to the sunk entry costs. Second, there is some unobservable factor, such as very popular teachers or an exceptional location, that protects the incumbent large monopoly from the threat of new firm entry. As the explanation rests on extreme values of unobservable variables it is difficult to refute, but at least it is not inconsistent with the very few large monopolies.

The pattern with a 'normal' production capacity for a given number of firms indicates that there will be entry by a new firm rather than an increase in firm size of the existing firms at some point - the stability restriction. At what market production capacity will there be entry by a new firm rather than an increase in size of the existing firms? Let the critical capacity above which there is entry by a new firm, $MCARS^*[FIRMS]$, be defined by $\text{prob}(FIRMS|MCARS^*) > \text{prob}(FIRMS{+}1|MCARS^*)$ and $\text{prob}(FIRMS{+}1|MCARS^*{+}1) > \text{prob}(FIRMS|MCARS^*{+}1)$. A comparison of the monopoly and duopoly columns reveals that markets with two cars are more likely to be monopolies (27 cases) than duopolies (6). Increasing the number of cars to three switches the relation to fewer monopolies (7) than duopolies (13), such that $MCARS^{*}[1]=2$ Similarly, comparing the duopoly and triopoly columns gives $MCARS^{*}[2]=6$. Above this level the small sample size becomes an obstacle in determining critical capacities. Tentatively $MCARS^{*}[3]=11$, but even at seven to eleven cars the difference is only one or two cases. Hence, the critical level of market production capacity, *above* which there is entry by a new firm rather than growth of the existing firms, are two, six and eleven cars for monopolies, duopolies and triopolies, respectively. Interestingly, this is equivalent to two, three and (almost) four cars per firm such that the average firm size at the critical capacity is increasing in the number of firms.

Finally, consider the distribution of *FCARS*, conditional on both *MCARS* and *FIRMS*. It permits a more detailed picture of the tendency towards fragmentation, in particular in the smallest markets. Table 2 shows the distribution of *FCARS* for combinations of *FIRMS* and *MCARS* in markets with four firms or less and nine cars or less. We use the convention that {***FIRMS***; ***MCARS***; *FCARS*; *FCARS*; *FCARS*; *FCARS*} denotes the distribution of market structures, with zeros of *FCARS* suppressed.

TABLE 2 ABOUT HERE

Markets with two firms and four cars consist of 7 (completely) fragmented markets {**2**; **4**; 2; 2} and only 2 (completely) concentrated markets {**2**; **4**; 3; 1}.

Similarly, with two firms and five cars there are 10 fragmented {**2**; **5**; 3; 2} and 2 concentrated markets {**2**; **5**; 4; 1}. Increasing the number of cars by one gives 4 markets {**2**; **6**; 3; 3} and only 1 market {**2**; **6**; 4; 2}. There are no markets with the completely concentrated market structure {**2**; **6**; 5; 1}. The pattern with more fragmented market structures being more frequent than concentrated ones appears also for other combinations of *FIRMS* and *MCARS* with one exception, namely markets with three firms and six cars. For this combination there is only 1 fragmented structure {**3**; **6**; 2; 2; 2} and 4 of the more concentrated structure {**3**; **6**; 3; 2; 1}. This has a straightforward explanation. Note that duopoly markets with five cars are dominated by the distribution {**2**; **5**; 3; 2}. If capacity increases with one car either the market remains a duopoly, in which case the most likely structure is {**2**; **6**; 3; 3}, or it becomes a triopoly with six cars. How will these cars be distributed among the firms? Going from the most common duopoly with five cars, {**2**; **5**; 3; 2}, to a triopoly is most easily accomplished by adding a single car firm resulting in the structure {**3**; **6**; 3; 2; 1}, which was the spurious one. However, adding still another car tends to make the structure more fragmented since {**3**; **7**; 3; 2; 2} is more common than {**3**; **7**; 3; 3; 1}. As noted above,, the set of observed market structures is only a subset of possible structures. For example, with three or more firms there is no market where all firms have one car each, and only the 2 markets {**3**; **5**; 3; 1; 1} have the completely concentrated structure for a given number of firms and cars.

Probability theory suggests an alternative explanation to why fragmented structures are more likely than concentrated ones. For example, if three cars are added to two firms independently and with equal probability, the probability that all three cars end up in either of the firms is only $2*(1/2)^3=0.25$ but with 0.75 probability the distribution will be two cars in one firm and one car in the other. As a benchmark for comparison, the multinominal probability of each observed distribution is reported in last column in Table 2.[8] There are too few observations to permit meaningful statistical testing of the observed distribution against the multinomial benchmark but at least for some combinations the number of observed fragmented structures is considerably above what is expected. Two examples: The benchmark is that {**2**; **4**; 2; 2} and {**2**; **4**; 3; 1} are equally likely, but the observed ratio is 7 to 2. Likewise {**2**; **6**; 3; 3} and {**2**; **6**; 4; 2} has probability 0.375 and 0.5, respectively, but the observed ratio is 4 to 1. While not conclusive, it suggests that the observed tendency towards fragmentation is stronger than can be explained by reference to 'pure chance'.

[8] The assumptions are that the number of firms is given, each firm has one car at the outset, MCARS-FIRMS cars are added independently, and that the probability that a car enters a specific firm is 1/FIRMS.

4. Concluding remarks

This paper has studied the size distribution of firms in the same industry but who compete in different regional markets. It provides an illustration of the tendency for free entry industries with exogenous sunk costs to fragment. Discussions of the observed market structures were based on the two restrictions of viability (all active firm covering sunk entry costs and fixed cost of production) and stability (no profitable entry opportunity remains unexploited), Sutton (1997b). At some critical level of production capacity there tends to be entry by a new firm rather than an increase in the size of the existing ones: the stability restriction. Below this critical capacity level it is the smallest firm that is most likely to add the next unit of capacity. Some fragmented market structures with many small firms were never observed: the viability restriction.

The tendency for firms within a market to be of the same size together with a positive correlation between average firm size and market size, suggests that the market size distribution is driving the firm size distribution at the industry level. The empirical regularity that the size distribution of firms is skewed may then be due to aggregation of firms that operate in separate markets, whose size distribution is also skewed. Hence, the results emphasise the importance of correctly identifying the market(s) where each firm is active in studies of the size distribution of firms and growth rates of firms.

References

Asplund, M. and R. Sandin, 1998a, Competition in Interrelated Markets: An Empirical Study, forthcoming in *International Journal of Industrial Organization*.

Asplund, M. and R. Sandin, 1998b, The Number of Firms and Production Capacity in Relation to Market Size, forthcoming in *Journal of Industrial Economics*.

Bresnahan, T. F., and P. C. Reiss, 1990, Entry in Monopoly Markets, *Review of Economic Studies*, 157, 531-553.

Bresnahan, T. F., and P. C. Reiss, 1991, Entry and Competition in Concentrated Markets, *Journal of Political Economy*, 99, 977-1009.

Cabral, L., 1995, Sunk Costs, Firm Size and Firm Growth, *Journal of Industrial Economics*, 43, 161-172.

Gilbert, R., 1989, Mobility Barriers and the Value of Incumbency, in R. Schmalensee and R. Willig, (eds), Handbook of Industrial Organization, Vol. 1 (Elsevier Science Club), 475-535.

Jovanovic, B., 1982, Selection and the Evolution of Industry, *Econometrica*, 50, 649-670.

McCloughan, P., 1995, Simulation of Concentration Development from Modified Gibrat Growth-Entry-Exit Processes, *Journal of Industrial Economics*, 43, 405-433.

Robinson, W.T. and J. Chiang, 1996, Are Sutton's Predictions Robust?: Empirical Insigth into Advertising, R&D, and Concentration, *Journal of Industrial Economics*, 44, 389-408.

Schmalensee, R., 1989, Inter-Industry Studies of Structure and Performance, in R. Schmalensee and R. Willig, (eds), Handbook of Industrial Organization, Vol. 2 (Elsevier Science Club), 951-1009.

Sutton, J., 1998, Technology and Market Structure: Theory and History, The MIT Press, Cambridge, Mass. and London.

Sutton, J., 1997a, Gibrat's Legacy, *Journal of Economic Literature*, 35, 40-59.

Sutton, J., 1997b, One Smart Agent, *Rand Journal of Economics*, 28, 605-628.

Sutton, J., 1991, Sunk Costs and Market Structure: Price Competition, Advertising and the Evolution of Concentration, The MIT Press, Cambridge, Mass. and London.

Table 1. Cross Tabulation of the number of firms in the market (*FIRMS*) and the aggregate production capacity (*MCARS*). Each cell contains the number of markets, and the means of market size (*MSIZE*) and Herfindahl index.

MCARS	*FIRMS*	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**13**	**Total**
1	MARKETS	29												**29**
	MSIZE	1231												**1231**
	HERFINDAHL	1.000												**1.000**
2	MARKETS	27	6											**33**
	MSIZE	1242	1180											**1230**
	HERFINDAHL	1.000	0.500											**0.909**
3	MARKETS	7	13	0										**20**
	MSIZE	2021	1627											**1765**
	HERFINDAHL	1.000	0.556											**0.711**
4	MARKETS	5	9	4	0									**18**
	MSIZE	1300	2144	2644										**2021**
	HERFINDAHL	1.000	0.528	0.375										**0.625**
5	MARKETS	1	12	8	0	0								**21**
	MSIZE	1478	2193	2818										**2397**
	HERFINDAHL	1.000	0.547	0.380										**0.505**
6	MARKETS	2	5	5	0	0	0							**12**
	MSIZE	1917	2609	2972										**2645**
	HERFINDAHL	1.000	0.511	0.378										**0.537**
7	MARKETS	0	0	5	4	0	0	0						**9**
	MSIZE			2899	3419									**3130**
	HERFINDAHL			0.363	0.276									**0.324**
8	MARKETS	0	1	3	2	0	0	0	0					**6**
	MSIZE		3345	3640	4740									**3958**
	HERFINDAHL		0.531	0.354	0.281									**0.359**
9	MARKETS	0	0	3	2	1	0	0	0	0				**6**
	MSIZE			4702	4358	6090								**4819**
	HERFINDAHL			0.374	0.272	0.259								**0.321**
10	MARKETS	0	1	2	0	0	0	0	0	0	0			**3**
	MSIZE		5069	3113										**3765**
	HERFINDAHL		0.520	0.340										**0.400**
11	MARKETS	0	1	1	0	2	0	0	0	0	0	0		**4**
	MSIZE		4086	3020		4907								**4230**
	HERFINDAHL		0.504	0.355		0.264								**0.347**
12	MARKETS	0	1	0	1	0	1	0	0	0	0	0		**3**
	MSIZE		4191		2853		9303							**5449**
	HERFINDAHL		0.625		0.319		0.194							**0.380**
13	MARKETS	0	1	0	1	1	0	0	0	0	0	0	0	**3**
	MSIZE		6401		10490	4090								**6994**
	HERFINDAHL		0.503		0.278	0.207								**0.329**
14	MARKETS	0	0	1	1	1	0	1	0	0	0	0	0	**4**
	MSIZE	0		8544	1892	6065		9958						**6615**
	HERFINDAHL			0.347	0.296	0.235		0.173						**0.263**
15	MARKETS	0	0	0	1	0	0	0	0	0	0	0	0	**1**
	MSIZE				3804									**3804**
	HERFINDAHL				0.262									**0.262**
16	MARKETS	0	0	0	0	1	1	0	0	0	0	0	0	**2**
	MSIZE					5823	8823							**7323**
	HERFINDAHL					0.234	0.219							**0.227**
17	MARKETS	0	0	0	0	2	0	0	0	0	0	0	0	**2**
	MSIZE					8235								**8235**
	HERFINDAHL					0.221								**0.221**
18	MARKETS	0	0	0	0	0	0	1	1	0	1	0	0	**3**
	MSIZE							3975	9864		10360			**8066**
	HERFINDAHL							0.204	0.148		0.130			**0.160**
19	MARKETS	0	0	0	1	0	0	0	0	0	0	0	0	**1**
	MSIZE				5445									**5445**
	HERFINDAHL				0.280									**0.280**
20	MARKETS	0	0	0	0	1	1	0	1	0	0	0	0	**3**
	MSIZE					7069	7751		10445					**8422**
	HERFINDAHL					0.245	0.230		0.145					**0.207**
TOTAL	MARKETS	**71**	**50**	**32**	**13**	**9**	**4**	**4**	**4**	**2**	**3**	**2**	**2**	**196**
	MSIZE	**1341**	**2200**	**3291**	**4335**	**6158**	**8012**	**9784**	**13954**	**10380**	**12340**	**14772**	**16193**	
	FCARS	**1.99**	**2.29**	**2.28**	**2.60**	**2.84**	**2.96**	**2.82**	**2.66**	**2.50**	**2.40**	**2.73**	**2.38**	
	HERFINDAHL	**1**	**0.535**	**0.369**	**0.280**	**0.239**	**0.210**	**0.185**	**0.150**	**0.131**	**0.128**	**0.118**	**0.109**	
	1/FIRMS	**1**	**0.5**	**0.333**	**0.25**	**0.2**	**0.166**	**0.143**	**0.125**	**0.111**	**0.1**	**0.091**	**0.077**	

In 54 markets (with an average *MSIZE* of 974) there are no firms. Markets with *MCARS*>20 are not reported separately.

Table 2. Distribution of firm sizes (*FCARS*) conditional on the number of firms in the market (*FIRMS*) and aggregate production capacity (*MCARS*). Firm sizes are ranked in descending order.

FIRMS	***MCARS***	*FCARS*	*FCARS*	*FCARS*	*FCARS*	*MARKETS*	*Prob*[a]
2	**2**	1	1			6	1.000
2	**3**	2	1			13	1.000
2	**4**	2	2			7	0.500
2	**4**	3	1			2	0.500
2	**5**	3	2			10	0.750
2	**5**	4	1			2	0.250
2	**6**	3	3			4	0.375
2	**6**	4	2			1	0.500
2	**8**	5	3			1	0.469
3	**4**	2	1	1		4	1.000
3	**5**	2	2	1		6	0.667
3	**5**	3	1	1		2	0.333
3	**6**	2	2	2		1	0.222
3	**6**	3	2	1		4	0.667
3	**7**	3	2	2		3	0.444
3	**7**	3	3	1		2	0.222
3	**8**	3	3	2		2	0.370
3	**8**	4	2	2		1	0.247
3	**9**	4	3	2		2	0.494
3	**9**	4	4	1		1	0.082
4	**7**	2	2	2	1	3	0.375
4	**7**	3	2	1	1	1	0.562
4	**8**	2	2	2	2	1	0.094
4	**8**	3	3	1	1	1	0.141
4	**9**	3	2	2	2	1	0.234
4	**9**	3	3	2	1	1	0.351

Markets with *FIRMS*>4 and *MCARS*>9 are excluded. Information on monopoly markets is found in Table 1.

a) Probability of size distribution. Multinomial distribution, conditional on adding MCARS-FIRMS cars independently and with equal probability (1/FIRMS) to the distribution where each firm has one car.