CPI COMPETITION POLICY INTERNATIONAL

CPI Antitrust Chronicle

Oct 2014 (1)

Competition Policy in Selection Markets

Neale Mahoney (Univ. of Chicago),
André Veiga (Nuffield College, Oxford Univ.),
&
Glen Weyl (Microsoft Research, Univ. of Chicago)

www.competitionpolicyinternational.com

Competition Policy in Selection Markets

Neale Mahoney, André Veiga & Glen Weyl[1]

I. INTRODUCTION

One of the oldest arguments against both competition and the policies promoting it is the problem of cream-skimming. In *selection markets*, like insurance and finance, where some customers are cheaper to serve than others, competitors have an incentive to poach the most lucrative customers from their rivals, the "cream." As Rothschild & Stiglitz[2] and de Meza & Webb[3] famously showed, this form of competition often causes severe problems, as competing firms distort their product quality or price in order to attract the cream. Such concerns were a leading part of debates over public utility regulation and the antitrust defense of AT&T, as highlighted by Faulhaber,[4] and have been well known in economics since the work of Rothschild and Stiglitz. However cream-skimming has never made it into the models economists use to evaluate mergers and other competition policy issues.

This article reviews a pair of recent papers (Mahoney & Weyl[5]; Veiga & Weyl[6]) in which we have begun to fill this lacuna. In particular, we have found that in many realistic cases there can be too much competition in selection markets and that, even when this is not the case, many standard intuitions of competition policy are reversed by the presence of selection.

We define a selection market as one where some central feature of the product sold requires that purchasers have heterogeneous costs to the firm. For instance, insurance would not be insurance if it did not indemnify individuals against their future costs, but in doing so it makes unhealthy consumers more expensive to cover. Other examples of selection markets include:

1. Financial markets, where limited liability and risk-aversion may force the financier to share the benefits and costs of the financed project with the financed individual or firm.

---

[1] Neale Mahoney is an Assistant Professor of Economics and Neubauer Family Faculty Fellow at the University of Chicago Booth School of Business and may be reached at Neale.Mahoney@ChicagoBooth.edu. André Veiga is a Postdoctoral Fellow at Nuffield College and the Department of Economics of the University of Oxford and may be reached at Andre.Veiga@economics.ox.ac.uk. Glen Weyl is a Researcher at Microsoft Research New England and an Assistant Professor of Economics and Law at the University of Chicago and may be reached at GlenWeyl@Microsoft.com. We are grateful to seminar participants at the United Kingdom Competition and Markets Authority for useful feedback.

[2] Michael Rothschild & Joseph E. Stiglitz, *Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information*, 90(4) QUARTERLY J. ECON., 629-649 (1976).

[3] David de Meza & David C. Webb, *Too Much Investment: A Problem of Asymmetric Information*, 102(2) QUARTERLY J. ECON., 281-292 (1987).

[4] Gerald R. Faulhaber, *Cross-Subsidization: Pricing in Public Enterprises*, 65(5) AMER. ECON. REV., 966-977 (1975).

[5] Neale Mahoney & E. Glen Weyl, *Imperfect Competition in Selection Markets* (2014) *available online at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2372661.

[6] André Veiga & E. Glen Weyl, *Product Design in Selection Markets* (2014) *available online at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1935912.

2. Platform markets, like Facebook, where much of the value of the service is generated by its users, some of which are much more active or popular than others.
3. Customer markets, like many supply relationships, where suppliers form long-term relationships with customers and landing a loyal "big fish" can become a continuing source of profit.

While all these markets feature selection, the patterns of selection are quite different across them. Insurance markets often feature *adverse* selection, where those most eager to purchase the product are the least desirable customers. Conversely, financial markets often have *advantageous* selection: the riskiest customers are the least likely to apply for credit and are attracted only by the teaser rates and low down-payments that firms use to attract other, more profitable customers.

In this article we discuss the severe, but very different, problems created for competition policy in these two environments. To do so, we draw on calibrated models of sub-prime automobile lending and health insurance that we developed in related papers. We then turn to the implications of our analysis for practical competition policy.

II. ADVANTAGEOUS SELECTION AND EXCESS CREDIT

The 2008 financial crisis highlighted the large social costs of excessive consumer credit. As documented by Mian & Sufi[7], the pre-crisis period featured generous loan terms to subprime borrowers in the form of sharply reduced down-payment requirements and negligent verification of borrower income. This was followed by an increase in default rates and reduction in lender profit. This evidence is consistent with de Meza & Webb's[8] definition of advantageous selection: marginal borrowers, who are drawn to borrowing by the reduced down-payment and documentation requirements, are worse credit risks than the average borrower.[9]

As de Meza & Webb explain, advantageous selection leads competitive markets to supply too much credit. Competing lenders are eager to attract profitable inframarginal consumers from their competitors. However, they are unable to distinguish them from the less profitable marginal consumers. This forces them to offer more generous terms to all borrowers, attracting risky borrowers along with the cream. Yet from society's perspective these two effects are not balanced because, when a lender successfully poaches profitable borrowers, it imposes an externality on its competitors. A monopolistic lender would internalize these "cream-skimming" externalities but competitive firms do not, leading them to offer excessively generous borrowing terms. This suggests that policies such as the Gramm-Leach-Bliley Act, which intended to bring

[7] Atif Mian & Amir Sufi, *The Consequences of Mortgage Credit Expansion,* 124(4) QUARTERLY J. ECON., 1449-1496 (2009).

[8] David de Meza & David C. Webb, *Too Much Investment: A Problem of Asymmetric Information*, 102(2) QUARTERLY J. ECON., 281-292 (1987).

[9] If, on the other hand, competition is primarily on interest rates rather than on down-payments, Stiglitz & Weiss argue selection may be adverse. We are not aware of any evidence confirming this theory in consumer credit markets and much of the competition over this period appears to have been on dimensions that seem likelier to lead to advantageous selection. This is confirmed by the data we calibrate to. However, obviously more research in this area would be very valuable. Joseph E. Stiglitz & Andrew Weiss, *Credit Rationing in Markets with Imperfect Information*, 71(3) AMER. ECON. REV., 393-410 (1981).

"greater…competition in the financial services industry," could have contributed to an inefficient credit boom.[10]

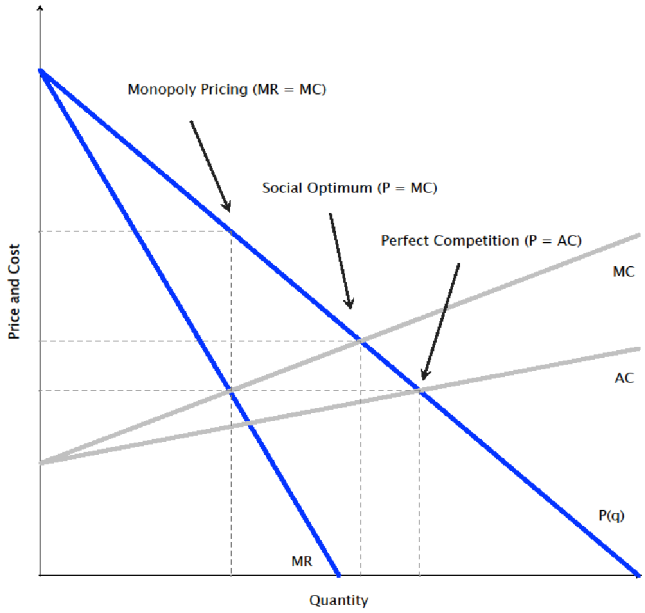

Figure 1: The distortions of perfect competition and monopoly under advantageous selection.

The economic logic behind this argument can be demonstrated in a simple graph. Consider the determinants of the equilibrium down-payment on a loan P, holding fixed the interest rate and total amount borrowed. Figure 1 plots inverse demand, average cost (AC) and marginal cost (MC) of supplying the loan as a function of the fraction of the population receiving a loan, q. AC and MC are upward-sloping under advantageous selection, since marginal borrowers are costlier than inframarginal borrowers. As is familiar, the socially optimal quantity of loans occurs when demand intersects marginal cost ($P = MC$). At the competitive equilibrium where firms earn zero profits ($P = AC$), there is more credit supplied than is socially optimal. Conversely, a monopolist would supply credit until marginal revenue equals marginal cost ($MR = MC$), which is less than the socially optimal amount.

The social optimum thus lies between perfect competition and monopoly. In fact, in Mahoney & Weyl,[11] we show that there is always an intermediate degree of market power that achieves the social optimum. An increase in market power is socially useful if there is excessive provision of credit, while an increase in competition is desirable if credit is under-supplied.

Is it plausible that excessive competition in the 2000s contributed to an inefficient credit boom? To investigate this question we drew on data from subprime auto lending studied by Einav, Jenkins, & Levin[12] (henceforth "EJL"). The setting is useful because quasi-randomization

[10] President Clinton's signing statement, November 12, 1999: http://www.presidency.ucsb.edu/ws/?pid=56922.

[11] Mahoney & Weyl, *supra* note 4.

[12] Liran Einav, Mark Jenkins, & Jonathan Levin, *Contract Pricing in Consumer Credit Markets,* 80(4) ECONOMETRICA, 1387-1432 (2012).

of contract terms allows for clean estimation of the underlying market parameters and because the borrowers in EJL's data are similar in many dimensions to subprime mortgage borrowers. EJL's calibrated model indicates extreme advantageous selection. For the modal contract, borrowers marginal with respect to a change in minimum down payment default 79 percent of the time, compared to only 59 percent among average borrowers.

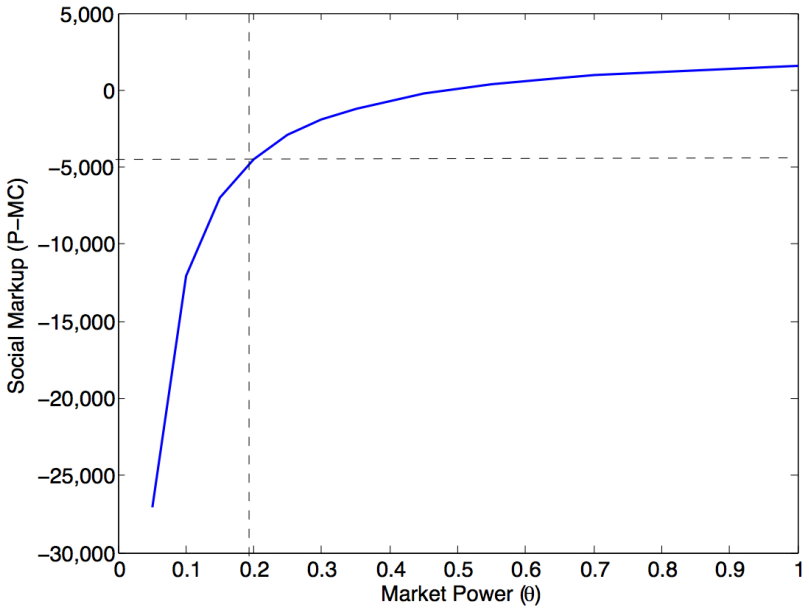

Figure 2: The social mark-up as a function of market power in a calibration of Mahoney & Weyl[13] to the EJL subprime auto loan data.

The net distortion from advantageous selection and market power can be summarized by the social markup for the marginal borrower, which is the gap between the price they pay and the average marginal cost of providing them a loan. Figure 2 plots this social markup (y-axis) as a function of a market power parameter θ (x-axis), where 0 represents perfect competition and 1 monopoly. The value $\theta = 0.2$ is a useful benchmark: with symmetric Cournot firms it corresponds to an Herfindahl-Hirschman Index of 2,000, just above the threshold the Department of Justice uses to define markets as highly concentrated.

The figure indicates that, in this case, the marginal borrower is subsidized by $4,462 or 41 percent of the price of the car. The marginal borrower receives a subsidy whenever $\theta < 0.5$, which corresponds to a symmetric Cournot duopoly, indicating that higher levels of concentration may be desirable. While our analysis should be interpreted with caution, implicit subsidies of this magnitude could easily reverse standard prescriptions for competition policy and the design of pro-competitive financial deregulations that do not consider selection.

III. ADVERSE SELECTION AND STINGY INSURANCE

When selection is *adverse*, as is typical in health insurance markets, competition does not lead to oversupply, but the opposite. Marginal purchasers of health insurance are usually "young invincibles" who are cheap to cover. Infra-marginal purchasers are typically the elderly and sick,

[13] Mahoney & Weyl, *supra* note 4.

who are willing to pay more to have coverage. For insurers to break even in a perfectly competitive market, they must set premiums to cover the cost of the elderly and sick. Since these premiums are higher than the cost of serving the young invincibles, high premiums may drive many of them out of the market, an effect familiar from the debates over the Affordable Care Act (henceforth "ACA"). In this case, market power only makes matters worse as it allows firms to further raise prices.

However, these results change when one considers that employers choose to offer their employees not only the price of a single plan, but rather several price-quality combinations for several plans. To see why, imagine a version of the ACA health exchanges with just two plans: bronze and platinum, the lowest- and highest-quality plans available under the ACA. If almost all healthy people opt for bronze leaving the sick in platinum plans—as the logic of adverse selection suggests—the cost of platinum plans will become prohibitive because the sick are so expensive to cover. This would encourage insurers to drive the platinum plans out of the market by drastically increasing their prices, resulting in a collapsed market where only bronze plans are purchased.

However, this "death spiral" does not typically happen with employer-provided insurance. Why don't their young invincibles opt for catastrophic care while the old and sick choose comprehensive plans? The reason is that employers don't simply price each plan at the cost of providing it. They care about the stability of the firm's insurance system as a whole, so they steer the young and healthy toward more comprehensive plans. They do this by raising the price of bronze plans, thereby effectively cross-subsidizing platinum plans. This is simply an extension of the basic idea of insurance, applied across the plans of a particular employer: those who are less at risk subsidize others who are more so.

Much like an employer, an oligopoly with sufficient market power can stop the destructive adverse selection spiral by similarly adjusting prices on plans of different qualities. There is an incentive to do so because each oligopolist is concerned with the stability of the market overall: if the market collapses oligopolists obtain lower profits. Large insurers will thus raise the prices of bronze plans to steer some healthy individuals toward platinum, thereby improving market stability. However, this will not happen if several smaller insurers can destabilize the market by offering cheap bronze plans that poach the healthiest people from the large insurers. This could force even large insurers to restrict themselves to only a bronze plan, even though it is typically in the interest of large insurers to pursue a broader slice of the market. Only if many small insurers hold profits down does the bronze-only strategy pose a real threat.

To investigate the empirical relevance of this possibility, in Veiga & Weyl[14] we considered a simple model of insurance competition where each insurer can offer a single plan with premium P, covering a percentage x of a consumer's medical spending. For instance, a bronze plan is x =60 percent, while platinum is x =90 percent. We then used data that Handel, Hendel, & Whinston[15] collected from a large insurer to calibrate a model of demand. We studied the effect of market power on the (unique) equilibrium predicted by our solution concept. Market

[14] Veiga & Weyl, *supra* note 5.

[15] Benjamin R. Handel, Igal Hendel, & Michael D. Whinston, *Equilibria in Health Exchanges: Adverse Selection vs. Reclassification Risk (2014) available online at* http://emlab.berkeley.edu/~bhandel/wp/Exchanges_reclassification_HHW.pdf.

power was measured by considering the markup as a percentage of the average cost of providing the offered actuarial rate x.

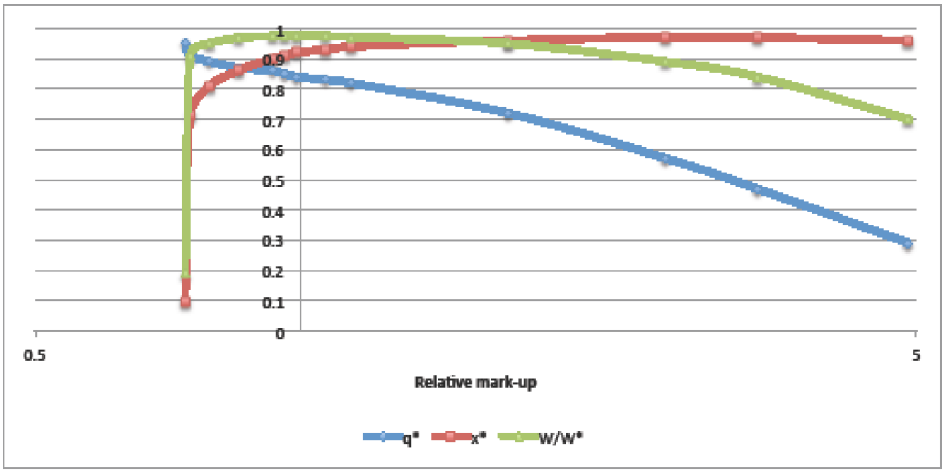

Figure 3: Population coverage, actuarial rate and welfare relative to the first best as a function of the relative mark-up (load) in the calibration of Veiga & Weyl[16] to the Handel, Hendel, & Whinston[17] data.

Figure 3 shows our results. As market power rises, firms raise prices and thus the fraction of individuals who obtain insurance ($q^\star$, shown in blue) declines. However, at the same time, the actuarial rate offered by the insurers ($x^\star$) rises rapidly. If markups are less than 74 percent of cost, no insurance is possible in equilibrium because the incentives to cream-skim are too severe. By contrast, with a load of 110 percent, 94 percent insurance is offered and 82 percent of the population purchases insurance. While this scenario is not ideal, it manages to achieve 98 percent of the welfare realized in the ideal setting of every individual obtaining full insurance, whereas perfect competition leads to complete market collapse. As load rises above 110 percent, welfare begins to fall because the increase in actuarial rate is not enough to compensate for the decrease in the fraction of the population covered. Thus, once we include a choice of plan quality, we find that social welfare is maximized when there is a significant amount of market power, just as in our calibration with advantageous selection.

IV. IMPLICATIONS FOR COMPETITION POLICY

Of course both of these are particular calibrations, using particular models, studying particular data sets; for any given policy application they are unrepresentative. However, they do suggest that, for plausible magnitudes, selection may be a first-order consideration in competition policy.

In the case of adverse selection, blanket limits on competition or forbearance towards mergers and collusion would be, at best, an imperfect policy instrument. Competition has significant benefits in reducing premiums and thus expanding coverage rates.[18] A more effective approach would limit the ability of firms to compete on dimensions that can easily be used for

[16] Veiga & Weyl, *supra* note 5.

[17] Handel, et al., *supra* note 13.

[18] Leemore Dafny, Mark Duggan, & Subramaniam Ramanarayanan, *Paying a Premium on Your Premium? Consolidation in the US Health Insurance Industry,* 102(2) AMER. ECON. REV., 1161-1185 (2012).

cream-skimming. The ACA incorporates such limits in its regulations. However, the more competitive markets are, the more crucial it will be to ensure such regulations are in place. Furthermore, when such regulations are absent or failing, market power may be more desirable than allowing the market to collapse from cream-skimming.

In the case of advantageous selection, the argument against excessive competition is stronger. Indeed, advantageous selection may explain, or even justify, the extensive exemptions of financial firms from DOJ and FTC oversight under antitrust laws. Other policies, such as raising capital adequacy standards or taxing excessive bank leverage, could be means of limiting excess credit without transferring large profits to banks. However, absent such policies, uncritical support for pro-competitive measures, even and especially if they achieve their intended goals, seems unjustified. At the very least an analysis of the impacts of selection deserve attention similar to that devoted to more traditional antitrust analysis in the financial sector.

While our main goal here is to provoke thought and greater reflection in antitrust analysis on selection, we want to end by highlighting four more concrete implications of our analysis for perhaps the most canonical problem in competition policy: the analysis of mergers. The 2010 United States Merger Guidelines have been widely imitated around the world and embody the rough conventional wisdom on baseline principles for the analysis of horizontal mergers. Criticizing broad principles like these is something of a straw man, given that the Guidelines are careful to highlight their own limitations and space constraints.

However, we do not believe that the concerns selection raises for competition policy are widely understood. To help put this in sharp contrast, we now highlight four intuitions from the guidelines that are no longer appropriate in the context of selection markets, at least on a social surplus standard:

1. *Price-raising incentives are harmful:* Upward Pricing Pressure ("UPP"),[19] the merger-driven incentive of firms to raise prices, has now nearly surpassed concentration measures as the most canonical diagnostic for harms from mergers. However, in selection markets, UPP has a second source beyond the traditional motive (diversion ratio multiplied by mark-up): firms internalize their cream (or dregs) skimming from each other. This suppresses UPP under adverse selection and exaggerates it under advantageous selection; that is, UPP is large precisely when the merger may be beneficial and small when it is most harmful, along this second dimension. Thus UPP is no longer a monotone indicator of how harmful a merger is.
2. *Competition-reduction is a harm diagnostic:* An important motivation behind UPP is that the diversion ratio (the number of sales lost when a firm raises its price that are recaptured by its merger rival), is a useful indicator of the intensity of competition between two rivals that will be removed by the merger. Because competition-reduction is harmful under the usual logic, the greater the diversion ratio the more threatening the merger. However in the presence of advantageous selection it is precisely intense competition that leads to over-supply. Only when competition is very intense, and thus

[19] Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, 10(1) BERKLEY ELECTRONIC J. THEORETICAL ECON., (2010).

the good is severely over-supplied, can reducing competition through a merger be beneficial. Thus, under advantageous selection, it may be that the *more* a merger eliminates competition (the higher the diversion ratio between the merging firms) the more likely it is to be beneficial.

3. *Mark-ups over marginal cost are predictive of price-raising incentives:* Other than the diversion ratio, the other term in UPP is the firm's mark-up over its *marginal* cost. This represents the opportunity cost of the sales diverted from the rival when price is lowered, because it is the marginal unit that goes unsold. However, in a selection market it is not just the number of units that are sold, but who they are sold to, that determines cost; in fact, in most realistic cases it is only *who* and not *how many* that determines average cost. This means that marginal cost is only the appropriate measure if the average marginal purchaser from one firm is identical to the average purchaser a firm attracts from its merger partner; that is, if the diversion ratio is 1! Otherwise average cost will often be a better proxy than marginal cost, as average consumers are likely more representative of those attracted from other firms than are marginal consumers attracted from the ranks of the uninsured or unbanked.
4. *Demand data is typically more useful than firm administrative data:* Because internal firm data usually records average costs much more reliably than marginal cost, it has become common to use firm first-order conditions to recover marginal costs using demand data[20] for the purposes of calculating mark-up. A prejudice has thus developed that demand data is typically more important and useful than is administrative data within firms. However, if average cost is a better proxy than marginal cost in the calculation of the relevant mark-up, then administrative data will often be a better guide to costs than demand data, particularly when the latter cannot be linked to the eventual (administratively recorded) costs of the client. At the very least, administrative data is crucial to complement demand data in selection markets, as has been recognized in the growing literature on selection markets.[21]

V. CONCLUSION

We hope to have persuaded the reader that selection, a prevalent phenomenon in many important markets, poses fundamental challenges to competition policy, potentially overturning many established intuitions. Our research has only begun to explore these challenges and offers more questions than it provides answers. We hope that future research will help to establish a more coherent framework for competition policy in these settings and clarify the breadth of cases in which selection is a first-order concern in competition policy.

[20] James N. Rosse, *Estimating Cost Function Parameters Without Using Cost Data: Illustrated Methodology,* 38(2) ECONOMETRICA, 256-275. (1970).

[21] Liran Einav, Amy Finkelstein, & Jonathan Levin, *Beyond Testing: Empirical Models of Insurance Markets*, 2(1) ANNUAL REV. ECON., 311-336. (2010).