Competition for quality and optimal merger policy*

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Abstract

We analyze optimal merger policy in oligopoly markets with endogenous quality and fixed costs. The antitrust authority maximizes a generalized welfare function where consumer surplus can be over or under valued. We show that even with moderate overvaluation of consumer surplus all the mergers should be forbidden. Comparisons with a benchmark model with exogenous quality and fixed costs show that optimal merger policy should not be substantially more permissive in the model with endogenous quality. Those results contrast sharply with some literature tending to justify permissive merger policies reinforcing the presence of "national champions" in high-tech industries.

Keywords: endogenous quality, merger policy, oligopoly
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1 Introduction

In recent years there has been a growing debate on the role of merger policy on innovation, particularly in intensive R&D industries. In their contribution to this debate, Katz and Shelanski (2006) emphasize that the merger policy should take into account explicitly its effect on innovation incentives. In turn this debate is connected with the controversy about the convenience of industrial policies favouring the so-called "national champions" (See the discussion of this issue in Maincent and Navarro, 2006 and Geroski, 2006). In particular, Salant and Shaffer (1999) develop a model justifying the promotion of "national champions" which is based on the idea that concentrating R&D efforts in large firms is socially more efficient than imposing a fragmented industrial structure. We can interpret their results as suggesting (directly or indirectly) that a lenient merger policy should be implemented in congruence with the parallel industrial policy supporting a national champion. In fact, as discussed by Geroski (2006) supporters of national champions usually call for this congruence.

In the context of cost-reducing R&D, some recent papers tend to reinforce the idea that merger policy should be more permissive in intensive R&D industries (See Faulí-Oller, 2002, Cabiolis et al., 2005, and Faulí-Oller et al., 2007). In contrast with those models, we focus on quality-enhancing R&D and explicitly consider the existence of a lower-bound on the degree of concentration in the market (which in our symmetric model is equivalent to an upper-bound to the number of firms) independent of market size. Thus, our framework is consistent with the theoretical and empirical results by Sutton (1991 and 1998) regarding the interplay between endogenous sunk costs and market structure. Our research is related with some other recent contributions dealing with the connections between competition and R&D investment (See, among others, Symeonidis, 2000, Vives, 2004 and Aghion et al., 2005). Perhaps the closest contribution to ours is Vasconcelos (2006) who considers endogenous mergers in the context of a market with endogenous quality and sunk costs, very similar to ours. However, our approach differs from the article by this author in that we concentrate on the social effects of mergers, while Vasconcelos (2006) analyzes the private incentive by firms to form stable mergers or coalitions.

In our model, we assume that the antitrust authority maximizes a generalized welfare function where consumers' surplus can be over or under valued. We show that even a moderate degree of overvaluation of consumer surplus is enough to ensure that all the mergers should be forbidden. Moreover, we compare the results of our model with those obtained in a benchmark model with both exogenous quality and fixed costs and show that optimal merger policy should not be substantially more permissive in the model with endogenous quality. Those results contrast sharply with some literature tending to justify permissive merger policies oriented to reinforce the presence of "national champions" in high-tech industries.

The rest of the paper is organized as follows: Section 2 presents a benchmark model with exogenous quality, Section 3 analyzes the model with endogenous quality and Section 4 concludes.

2 The model with exogenous quality

Without loss of generality, let us assume a Cournot model with n identical firms, zero marginal costs and fixed cost $K = 1$. Inverse demand is $p = 1 - \frac{x}{S}$, where S is interpreted as the market size. Welfare objective of the social planner is defined as $W = \pi + \beta CS$, where π are total profits of the industry, CS is consumer surplus and β is a positive constant.[1] Standard computation of the Cournot equilibrium yields the following values for consumer surplus, firm i's profits and total welfare:

$$CS(S,n) = S\frac{1}{2}\frac{n^2}{(n+1)^2},$$

$$\pi_i(n) = S\frac{1}{(n+1)^2} - 1,$$

$$W(S,\beta,n) = S\frac{\beta}{2}\frac{n^2}{(n+1)^2} + S\frac{n}{(n+1)^2} - n.$$

The above simplifies to

$$W(S,\beta,n) = S\left(\frac{\frac{\beta}{2}n^2 + n}{(n+1)^2}\right) - n.$$

[1] Thus we assume a generalized social welfare function where $\beta - 1$ is the extra weight given by the social planner to consumer surplus, relative to plain conventional welfare. In particular Besanko and Spulber (1993) suggest that this extra weight should be positive to counter-balance some asymmetric information problems faced by the policy maker.

We have:

$$\begin{aligned}
\frac{\partial}{\partial n}\left(S\left(\frac{\frac{\beta}{2}n^2+n}{(n+1)^2}\right)-n\right) &= \frac{S+Sn\beta}{2n+n^2+1}+\frac{-2Sn-Sn^2\beta}{3n+3n^2+n^3+1}-1 \\
&= (n+1)^{-3}\left(\left(\beta-1\right)n+1\right)S-1
\end{aligned}$$

Let us define

$$v(n,S,\beta)=(n+1)^{-3}\left(\left(\beta-1\right)n+1\right)S-1.$$

The previous function is increasing in β and S, moreover, it is decreasing in n :

$$\begin{aligned}
& \frac{\partial}{\partial n}\left((n+1)^{-3}\left(\left(\beta-1\right)n+1\right)S-1\right) \\
= & \frac{S\beta-S}{3n+3n^2+n^3+1}+\frac{3Sn-3S-3Sn\beta}{4n+6n^2+4n^3+n^4+1} \\
= & -(n+1)^{-4}\left(2n\beta-\beta-2n+4\right)S<0,
\end{aligned}$$

where the last inequality comes from noticing that

$$2n\beta-\beta-2n+4>0 \Leftrightarrow 2n(\beta-1)-\beta+4>0,$$

and the last inequality is ensured by $\beta \geq 1$.

Let us define t as the upper bound on the number of firms in the market (maximum number consistent with non-negative profits). Zero profit condition implies: $(t+1)^2=S$. We can rewrite

$$v(n,(t+1)^2,\beta)\equiv h(n,t,\beta),$$

where

$$h(n,t,\beta)=\frac{(t+1)^2}{(n+1)^3}\left(\left(\beta-1\right)n+1\right)-1.$$

The socially optimal n is increasing in β. In particular, if $\beta=2$ then:

$$h(n,t,2)=\frac{(t+1)^2}{(n+1)^3}\left(n+1\right)-1=0\rightarrow n=t.$$

Thus, with $\beta \geq 2$ no merger should be allowed.
In general:

$$\begin{aligned} h(n,t,\beta) &= (t+1)^2\left((\beta-1)\,n+1\right)-(n+1)^3=0 \rightarrow \\ \beta(n,t) &= \frac{1}{n\,(t+1)^2}\left((n+1)^3+(t+1)^2\,(n-1)\right), \end{aligned}$$

where $\beta(n,t)$ is defined as the critical value of β such that n is the optimal number of firms, given the upper bound t on the feasible number of firms.

Note that the threshold $\beta(n,t) = \frac{(n+1)^3}{n(t+1)^2} + \frac{(n-1)}{n}$ is increasing in n and $\beta(t,t) = \frac{1}{t(t+1)^2}\left((t+1)^3+(t-1)\,(t+1)^2\right) = 2$.

Our previous analysis can be summarized in the following:

Proposition 1 *In the model with exogenous quality, the socially optimal number of firms is increasing in parameter β. In particular, no merger should be allowed if $\beta \geq 2$.*

The previous results shows that the optimal policy is extremely sensitive to social preferences regarding consumer surplus and profits. Provided that the antitrust authorities put higher weight to consumer surplus (which seems to be consistent with the spirit of US and EU merger guidelines) then we only need this weight to be two times greater than the weight given to industrial profits to ensure that no merger is socially profitable.

In our next section we show that those conclusions are not substantially different in the context of endogenous quality.

Now, let us consider consider the private incentives to merge. According to our calculations on profits, a merger among $k+1$ firms is privately profitable (unprofitable) if and only if the following function is positive (negative):

$$\begin{aligned} B(k,n,S) &= S\frac{1}{(n-k+1)^2}-1-\left((k+1)S\frac{1}{(n+1)^2}-(k+1)\right) \\ &= S\left(\frac{1}{(n-k+1)^2}-(k+1)\frac{1}{(n+1)^2}\right)+k. \end{aligned}$$

The above can be rewritten as:

$$\begin{aligned}\varepsilon(k,n,t) &\equiv B(k,n,(t+1)^2) \\ &= (t+1)^2\left(\frac{1}{(n-k+1)^2}-(k+1)\frac{1}{(n+1)^2}\right)+k.\end{aligned}$$

The previous expression is increasing in t and k.

Tables 1.A and 1.B show the values of $\varepsilon(k,n,t)\times 1000$ for $k\leq 2$ and all the values of n and t consistent with $t\leq 10$, except the trivial cases where merger is always profitable (that is: mergers to monopoly and mergers when $n=t$ since in this late case the initial profits are zero):

TABLE 1.A

$\varepsilon(k,n,t)\times 1000$

$k=1$

n \ t	4	5	6	7	8	9	10
3	652	500	319	111	−125	−388	−680
4		370	142	−120	−417	−750	−1117
5			237	4	−260	−555	−882
6				165	−56	−303	−577
7					121	−84	−311
8						93	−97
9							73

TABLE 1.B

$\varepsilon(k,n,t)\times 1000$

$k=2$

n \ t	5	6	7	8	9	10
4	1680	1564	1431	1280	1111	924
5		979	666	312	−83	−520
6			641	280	−122	−568
7				453	90	−310
8					337	−12
9						260

In the following section we will also make comparisons between the private incentives to merge in the model in this section and in the following section, where quality is endogenous.

3 The model with endogenous quality

Let us assume Cournot competition among n firms, after they have decided their level of investment in quality. As in the previous section, we assume zero marginal costs of production. The investment cost in quality, by firm i is given by $K = a_i^{\gamma}$, where a_i is the quality chosen by firm i. A representative consumer maximizes its consumer surplus, given by:

$$CS = \sum_{i=1}^{n} a_i x_i - \frac{1}{2S}\left(\sum_{i=1}^{n} x_i\right)^2 - \sum_{i=1}^{n} p_i x_i.$$

The maximization of the previous function with respect to each x_i gives the following demand system:

$$p_i = a_i - \frac{x}{S}, i = 1, ..., n;$$

where $x \equiv \sum_{i=1}^{n} x_i$ and S is interpreted as the market size.

Standard computations yields the following values of CS, π_i and W at the subgame perfect equilibrium of the game where, first, each firm chooses its quality and then firms compete in a Cournot market:

$$CS(n,\gamma) = \frac{S}{2}\left(\frac{2S}{\gamma}\right)^{\frac{2}{\gamma-2}} \times \left(\frac{n^{\gamma-1}}{(n+1)^{\gamma}}\right)^{\frac{2}{\gamma-2}}$$

$$\pi_i(n,\gamma) = S\left(\frac{2S}{\gamma}\right)^{\frac{2}{\gamma-2}}\left(\frac{n}{(n+1)^2}\right)^{\frac{\gamma}{\gamma-2}}(\frac{1}{n} - \frac{2}{\gamma})$$

$$\begin{aligned}
W(n,\gamma,\beta) &= \left(\frac{n^{\gamma-1}}{(n+1)^{\gamma}}\right)^{\frac{2}{\gamma-2}}(\frac{\beta}{2}+\frac{1}{n}-\frac{2}{\gamma}) \\
&= \left(\frac{n^{2\gamma-2}}{(n+1)^{2\gamma}}\right)^{\frac{1}{\gamma-2}}(\frac{\beta}{2}+\frac{1}{n}-\frac{2}{\gamma}) \\
&= \left(\frac{n^{\gamma}}{(n+1)^{2\gamma}}\right)^{\frac{1}{\gamma-2}}(\frac{\beta}{2}n+1-\frac{2}{\gamma}n) \\
&= \left(\frac{n}{(n+1)^{2}}\right)^{\frac{\gamma}{\gamma-2}}((\frac{\beta}{2}-\frac{2}{\gamma})n+1).
\end{aligned}$$

For convenience, let us define the following monotonically increasing transformation of the previous welfare function:

$$\begin{aligned}
w(n,\gamma,\beta) &= \ln\left(W(n,\gamma,\beta)\right)^{\frac{\gamma-2}{\gamma}} \\
&= \ln\left(\left(\frac{n}{(n+1)^{2}}\right)^{\frac{\gamma}{\gamma-2}}((\frac{\beta}{2}-\frac{2}{\gamma})n+1)\right)^{\frac{\gamma-2}{\gamma}} \\
&= \ln\left(\left(\frac{n}{(n+1)^{2}}\right)((\frac{\beta}{2}-\frac{2}{\gamma})n+1)^{\frac{\gamma-2}{\gamma}}\right) \\
&= \ln(n)-2\ln(n+1)^{2}+\frac{\gamma-2}{\gamma}\ln\left((\frac{\beta}{2}-\frac{2}{\gamma})n+1\right),
\end{aligned}$$

which simplifies to:

$$w(n,\gamma,\beta)=\ln(n)-2\ln(n+1)+\frac{\gamma-2}{\gamma}\ln\left((\frac{\beta}{2}-\frac{2}{\gamma})n+1\right).$$

We have:

$$\frac{\partial}{\partial n}\left(w(n,\gamma,\beta)\right)=\frac{1}{n}-\frac{2}{n+1}+\frac{\gamma-2}{\gamma}\frac{(\frac{\beta}{2}-\frac{2}{\gamma})}{(\frac{\beta}{2}-\frac{2}{\gamma})n+1}.$$

The above derivative is clearly increasing in β and γ. Moreover:

$$\begin{aligned}\frac{\partial}{\partial n}\left(w(n,\gamma,\beta)\right) &= \frac{1}{n}-\frac{2}{n+1}+\frac{\gamma-2}{\gamma}\frac{(\frac{\beta}{2}-\frac{2}{\gamma})}{(\frac{\beta}{2}-\frac{2}{\gamma})n+1}\\ &= \frac{2\left(4n-4n\gamma-n\beta\gamma+4n^2+\gamma^2-n\gamma^2+n\beta\gamma^2-n^2\beta\gamma\right)}{\left(2\gamma-4n+n\beta\gamma\right)\left(n+1\right)\gamma n}.\end{aligned}$$

The sign of the previous derivative is given by

$$f(n,\gamma,\beta)=4n-4n\gamma-n\beta\gamma+4n^2+\gamma^2-n\gamma^2+n\beta\gamma^2-n^2\beta\gamma.$$

On the other hand:

$$\frac{\partial f(n,\gamma,\beta)}{\partial n}=8n-4\gamma-\beta\gamma-2n\beta\gamma-\gamma^2+\beta\gamma^2+4.$$

Since the last derivative is decreasing in n and $f(0,\gamma,\beta)=\gamma^2>0$, it follows that $f(n,\gamma,\beta)$ is concave in n with just one positive root. Thus welfare is increasing (decreasing) if n is lower (greater) than this root.

We can define $f(n,2t,\beta)=g(n,t,\beta)$ where t is the upper bound to the number of active firms (the maximum number consistent non-negative profits). In our case $t=2\gamma$. We have:

$$\begin{aligned}g(n,t,\beta) &= 4n-8nt-2n\beta t+4n^2+4t^2-4nt^2+4n\beta t^2-2n^2\beta t=0\rightarrow\\ b(n,t) &= \frac{2}{tn\left(2t-n-1\right)}\left(2nt-n-n^2-t^2+nt^2\right)\end{aligned}$$

Where function $b(n,t)$ is defined as the critical β such that n is the optimal number of firms, given the upper bound t on the feasible number of firms.

According to our previous analysis, the critical threshold for β given by the last expression is increasing in n. In particular

$$b(t,t)=\frac{2}{t^2\left(t-1\right)}\left(t^3-t\right)=2\frac{(t+1)}{t}\leq 3$$

and

$$b(t-1,t)=2\left(t-1\right)^{-1}t^{-1}\left(t^2-t-1\right)=2\left(1-\frac{1}{t(t-1)}\right)<2.$$

Therefore if $\beta \geq 2$ and $n < t$ any merger should be forbidden.

The following result summarizes our analysis in this section:

Proposition 2 *In the model with endogenous quality, the socially optimal number of firms is increasing in parameter* β*. In particular, no merger should be allowed if* $\beta \geq 2$ *and* $n < t$*.*

Thus conclusions are rather similar to the case of exogenous quality and fixed costs. Table 2 and 3 display the critical values β and b for all the possible combinations of n and t when t goes from 1 to 10. We can consider a higher β as reflecting a higher degree of social preferences for a restrictive merger policy. According to this interpretation, the data shown in Tables 2 and 3 indicate that merger policy should not be substantially more permissive in the so-called high-tech industries, relative to conventional industries with exogenous quality and fixed costs. Note that in most cases differences involve less than 20% of extra valuation of consumer surplus in the model with endogenous quality, compared with the one with exogenous quality.

Our conclusions seem to indicate that the recent fashion of stimulating "National Champions" by a permissive policy regarding mergers and acquisitions (some times clearly stimulated by governments) does not appear to be much justified from the social welfare point of view.

TABLE 2:
Critical β in the exogenous quality model

$$\beta(n,t) = \frac{1}{n\,(t+1)^2}\left((n+1)^3 + (t+1)^2\,(n-1)\right)$$

t

n	2	3	4	5	6	7	8	9	10
2	2.0	1.34	1.04	0.87	0.77	0.71	0.66	0.63	0.61
3		2.0	1.52	1.25	1.10	1.00	0.93	0.88	0.84
4			2.0	1.61	1.38	1.23	1.13	1.06	1.00
5				2.0	1.68	1.47	1.33	1.23	1.15
6					2.0	1.72	1.53	1.40	1.30
7						2.0	1.76	1.58	1.46
8							2.0	1.78	1.62
9								2.0	1.80
10									2.0

TABLE 3:
Critical β (denoted by b) in the endogenous quality model

$$b(n,t) = \frac{2}{tn\,(2t-n-1)}\left(2nt - n - n^2 - t^2 + nt^2\right)$$

t

n \ t	2	3	4	5	6	7	8	9	10
2	3.0	1.66	1.30	1.11	1.0	0.92	0.86	0.82	0.78
3		2.66	1.83	1.51	1.33	1.21	1.13	1.07	1.03
4			2.5	1.90	1.61	1.45	1.34	1.26	1.20
5				2.4	1.93	1.68	1.53	1.42	1.34
6					2.33	1.95	1.73	1.58	1.48
7						2.28	1.96	1.76	1.62
8							2.25	1.97	1.79
9								2.22	1.97
10									2.20

Now, let us consider the private incentives to merge. A merger among $k+1$ firms is privately profitable (unprofitable) if and only if the following function is positive (negative):

$$
\begin{aligned}
B(k,n,\gamma) &= \left(\frac{n-k}{(n-k+1)^2}\right)^{\frac{\gamma}{\gamma-2}}\left(\frac{1}{n-k}-\frac{2}{\gamma}\right) - (k+1)\left(\frac{n}{(n+1)^2}\right)^{\frac{\gamma}{\gamma-2}}\left(\frac{1}{n}-\frac{2}{\gamma}\right) \lesseqqgtr 0 \\
\Leftrightarrow &\ \left(\frac{\frac{n-k}{(n-k+1)^2}}{\frac{n}{(n+1)^2}}\right)^{\frac{\gamma}{\gamma-2}}\left(\frac{1}{n-k}-\frac{2}{\gamma}\right) - (k+1)\left(\frac{1}{n}-\frac{2}{\gamma}\right) \lesseqqgtr 0 \\
\Leftrightarrow &\ \frac{1}{n}\left((2n-\gamma)(k+1)\right) + \frac{1}{n-k}(2k-2n+\gamma)\left(\frac{(n+1)^2(n-k)}{n(n-k+1)^2}\right)^{\frac{\gamma}{\gamma-2}} \lesseqqgtr 0 \\
\Leftrightarrow &\ \frac{-1}{n}\left(\frac{\gamma-2n}{2k-2n+\gamma}\right)(k+1) + \frac{1}{n-k}\left(\frac{(n+1)^2(n-k)}{n(n-k+1)^2}\right)^{\frac{\gamma}{\gamma-2}} \lesseqqgtr 0 \\
\Leftrightarrow &\ -\left(\frac{1}{2\frac{k}{\gamma-2n}+1}\right)\frac{(n-k)(k+1)}{n} + \left(\frac{(n+1)^2(n-k)}{n(n-k+1)^2}\right)^{\frac{\gamma}{\gamma-2}} \lesseqqgtr 0.
\end{aligned}
$$

Therefore, the sign of $B(k,n,\gamma)$ is the same as:

$$g(k,n,\gamma) = -\left(\frac{1}{2\frac{k}{\gamma-2n}+1}\right)\frac{(n-k)(k+1)}{n} + \left(\frac{(n+1)^2(n-k)}{n(n-k+1)^2}\right)^{\frac{\gamma}{\gamma-2}},$$

which is increasing in k and decreasing in γ (and, consequently on $t \equiv \frac{\gamma}{2}$) while the effect of "n" is ambiguous.

Therefore, we have he following

Lemma 3 *The private incentive to merge increases with the number of merging firms $k+1$ and decreases with the upper bound t on the number of firms.*

Let us define $E(k,n,t) = B(k,n,2t)$. That is:
$E(k,n,t) = \left(\frac{n-k}{(n-k+1)^2}\right)^{\frac{t}{t-1}} (\frac{1}{n-k} - \frac{1}{t}) - (k+1)\left(\frac{n}{(n+1)^2}\right)^{\frac{t}{t-1}} (\frac{1}{n} - \frac{1}{t})$.

In order to focus on concentrated markets, Tables 4.A and 4.B, illustrates the private gains to merge, represented by function $E(k,n,t)\times 1000$, for $k \leq 2$ and all the feasible values of n consistent with $t \leq 10$, except the trivial cases where merger is always profitable (that is: mergers to monopoly and mergers when $n = t$ since in this late case the initial profits are zero):

TABLE 4.A

$E(k,n,t) \times 1000$

$k = 1$

t

		4	5	6	7	8	9	10
	3	15	12	101	7	5	4	2
	4		6	3	1	-0.03	-1	-2
	5			4	1	-0.3	-1	-2
n	6				1	0.3	-0.8	-1
	7					0.9	-0.03	-0.8
	8						0.5	-0.1
	9							0.3

TABLE 4.B

$E(k,n,t) \times 1000$

$k=2$

		t					
		5	6	7	8	9	10
	4	30	27	23	21	18	16
	5		14	9	7	4	2
n	6			6	4	1	0.1
	7				3	1	0.1
	8					2	0.7
	9						1

According to Tables 4.A and 4.B, if $t \leq 10$ any merger reducing the number of competitors when $k = 2$ is privately profitable and, from our lemma, it follows that any merger with $k > 1$ is privately profitable in this case. By a similar argument, it follows that if $t \leq 7$ any merger is profitable. In conclusion, Tables 4.A and 4.B and the previous Lemma show the following

Proposition 4 *In the model of this section the following properties hold, regarding concentrated markets:*

a) If $t \leq 7$ *then any merger is privately profitable.*

b) If $t \in \{8, 9, 10\}$ *then any merger is privately profitable except in the following cases, associated to* $k = 1$*:*

i) $t = 8$ *and* $n \in \{4, 5\}$

ii) $t = 9$ *and* $n \in \{4, 5, 6, 7\}$

iii) $t = 9$ *and* $n \in \{4, 5, 6, 7, 8\}$

Our previous Proposition shows that if the upper bound on the number of firms, determined by technological conditions, is rather small, then firms have a powerful private incentive to merge.

By comparing Tables 4.A and 4.B with Tables 1.A and 1.B, it turns out that private incentives to merge in high-tech industries are stronger than in conventional industries with exogenous quality. On the one hand, this is consistent with the observed fact that in intensive R&D industries the attempt to merge is more usual, but on the other hand it also suggests that the role of antitrust policy should be reinforced in this case.

4 Conclusions and final comments

The discussion about the social desirability of mergers has substantially increased in recent years, particularly in connection with the role of this policy, and public policy in general, regarding intensive R&D industries. It is usually argued that mergers or policies favoring concentration of the markets in those industries can create efficiency gains, associated to better products and/or lower production costs, as a results of the increased incentives to innovate. A first objection to this view is that incentives to innovate does not appear to be monotonic with the degree of competition (See, among others the illustrative work by Aghion et al., 2005, for an empirical an theoretical assessment of this issue). A second objection is that even if market concentration favors innovation, it is not clear, from the social welfare point of view, that this effect dominates the negative effects associate to both the reduction in the degree of competition and the strategic incentives to over-invest, typical in some oligopoly markets. Based on this perspective, in our paper, we concentrate on the relationship between merger policy and welfare in a model where the quality of the goods is endogenous and determined by endogenous investment in R&D that can be affected by merger policy.

Our main finding is that even rather moderate levels of overvaluation of consumer surplus is enough to ensure that any merger should be forbidden. Moreover we also show that this critical degree of overvaluation is not substantially greater in our model with endogenous quality, compared with a benchmark with exogenous quality. Thus, taking into account that current US and EU mergers guidelines tend to overweight consumer surplus, our results suggest that some recent policies (including merger policies) tending to favor concentration in high-tech industries might not be justified.

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