

# The Competitive Balance Argument for Mergers

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First Draft: 16<sup>th</sup> November, 1999  
This Version: 16<sup>th</sup> December, 1999

This paper examines the so-called 'competitive balance' argument that favours some mergers. This argument states that mergers between relatively small firms that bring their size closer to that of larger firms is likely to be pro-competitive. It is found that, from an economic theory perspective, this argument has merits when larger firms are more likely than smaller firms to respond aggressively to output contractions by their rivals. Also examined are concerns regarding tacit collusion that might arise when firms are of equivalent size. Economic theory, however, draws ambiguous conclusions when this is taken into account. *Journal of Economic Literature* Classification Numbers: L41, L50.

*Keywords:* mergers, competition policy, competitive balance, tacit collusion.

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A horizontal merger means that the assets of two rival firms in a market come under the control of a single firm. As such, their strategic behaviour – in particular, pricing – can now be coordinated. In the absence of significant cost savings (that are directly attributable to the merger<sup>1</sup>), the basic presumption in economic theory is that a merger will be anti-competitive, in the sense of generating higher prices and lower consumer welfare. This is because the merger is likely to reduce the intensity of competition. In particular, if there are some entry barriers, incumbent firms will be under less pressure to reduce prices in response to a rival's price discounting and the merged firm will have lower incentives to expand production (or increase capacity) in response to a rival's output contraction.

However, it is sometimes argued that a merger can be pro-competitive if it involves two relatively small firms in an industry with at least one dominant firm. This is what is termed a 'competitive balance' argument. The notion behind it is that relatively equal sized firms will behave more competitively than unequal sized firms. Consequently, the merger may intensify price competition. Against this are the usual competitive concerns regarding mergers and also concerns about the removal of 'a vigorous and effective competitor.'

It is the goal of this paper to evaluate the 'competitive balance' argument in more detail. In particular, this argument is often made in industries where entry barriers are high and in a context where parties to a merger are relying heavily on market share data to convince competition authorities of its merits. For example, suppose that three firms in an industry had market shares of 50, 30 and 20 percent respectively. Then if the latter two were to merge, it is sometimes argued that their combined market share of 50 will make it more evenly balanced against the largest firm (see Figure 1). Ironically, however, if the merged firm were to maintain its market share of 50 percent, then there would be no competitive concerns over the merger. This is because, industry output would not contract and hence, consumers would be no worse off. So it is in the very context that the merged firm's output was expected to shrink that there would be potential competition concerns. But in this case, post-merger, the relative sizes of the two merged firms would be less even than a simple addition of market shares might indicate. This is the regulator's fear (see Figure 2).

In reality, the largest firm will not stay idle in response to a merger. Indeed, it is very possible that it may expand its output in response to any contraction in output by the merging firms. Thus, in reality the overall contraction in industry output may not be as extreme as a regulator may fear (see Figure 3). The key then to evaluating a competitive balance argument is to look at what output contraction might do to the behaviour of larger firms.

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<sup>1</sup> It is often the case the cost savings can be achieved by contractual means rather than through a merger. See, for example, Teece (1982) and Grossman and Hart (1986).

If that firm were to respond aggressively to an output contraction, then a merger is more likely to be pro-competitive than welfare reducing.

Given this, the focus of this paper is to consider how best to use market share data to evaluate mergers in industries with asymmetrically sized firms. In particular, it is demonstrated the measures of concentration based on market share data – such as the Hirschman-Herfindahl index – do not necessarily indicate whether increased concentration is socially undesirable. Indeed, with firm size asymmetries, the opposite is often true. Instead, the important tools for analysis are those that indicate the type of behavioural response the merger may engender from large firms in the industry.

The paper is organised as follows. In the next section, the role of concentration measures as indicators of social desirability is reviewed. Section II then applies that theory to evaluate the competitive balance argument. Section III then whether firm size asymmetries make tacit collusion more or less likely. A final section concludes.

## 1. Market Shares as Information

The problem facing a regulator is how to use the pre-merger characteristics of an industry to determine the social consequences of a proposed merger.<sup>2</sup> Traditionally, a *structuralist* approach has been used to tackle this problem. This approach takes so-called exogenous features of an industry – current concentration, capital intensity, advertising to sales ratios, etc. – as the key predictors of price-cost margins. The idea here is that structural entry barriers are the principal impediments to price competition in an industry. When entry barriers are high, even small mergers (without offsetting efficiency gains) are potentially anti-competitive.

The structuralist approach to competition analysis has been the subject of much criticism by economists. Demsetz (1974) argued that differences in firm productivity could account for concentration. Large firms are large precisely because they have lower costs. Therefore, high price-cost margins could be associated with higher productivity and not market power. A similar conclusion could be reached regarding entry barriers. These features – capital intensity, research and development and advertising – could be measuring economies of scale; an argument for ‘natural’ concentration.

The consequence of the critique of the structuralist approach was to focus economists on the *behavioural* aspects of competition (Smith and Round, 1998). The game theorists of the 1980s asked whether a merger was more

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<sup>2</sup> For a more detailed examination of the difficulties regulator’s face in evaluating mergers see Fels, Gans and King (1999).

likely to lead to market power being exercised.<sup>3</sup> In particular, using game-theoretic models, economists could analyse the effects of a merger on prices and overall welfare (that is, consumer plus producer surplus). They could take into account efficiencies that would account for pre-merger behaviour and concentration, as well as the influence of a merger on the likelihood of tacit collusion.

In this section, I review the most recent – behavioural – literature on merger analysis. Specifically, industries where entry barriers are high are considered. As such, the focus of the section is on the relationship between measures of pre-merger concentration, the degree of competition and level of welfare that might follow a proposed merger. The overall conclusion reached is that *there is no simple relationship between concentration, competition and welfare*. Indeed, it is entirely possible that (competition-reducing) mergers that increase concentration could lead to welfare improvements because this leads to industry output being produced more efficiently.

### 1.1 Mergers with Synergies

I first consider the basic behavioural approach to merger analysis. In so doing, it is assumed that the merger itself does not result in any synergies or savings from consolidation of fixed costs. As will be demonstrated, this does not imply an absence of production efficiencies from a merger. In general, mergers generate production rationalisation across firms. What this abstraction does is to separate competition from efficiency issues in the assessment of the social consequences of a merger. If there are efficiency improvements from a merger, that will only improve the case for a merger.

The analysis here uses the textbook measure of social welfare – the sum of consumer plus producer surplus. It is important to include profits in such an analysis because they represent income to the owners of the firms. For example, for larger corporations these represent the returns savers will receive on their retirement investments and superannuation funds. To exclude such notions by focusing simply on price would ignore the earnings of a significant segment of the economy.

The most commonly used measure of concentration in recent times is the Herfindahl-Hirschman Index ( $H$ ). This measure is as follows:

$$H = \sum_{i=1}^n s_i^2 ,$$

where  $s_i$  is the market share of firm  $i$ , and  $n$  is the total number of firms. Notice that for a monopoly  $H = 1$  while a very competitive industry would have  $H$  close to 0.

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<sup>3</sup> For a recent review see “The Economics of Antitrust,” *The Economist*, 2<sup>nd</sup> May, 1998, pp.66-68.

If two firms, say 1 and 2, merge,  $H$  is likely to increase. Indeed, it is tempting to suppose that the merged firm will produce their pre-merger market shares in which case  $H$  would increase by  $2s_1s_2$  as a result. However, this simple assessment has two difficulties:<sup>4</sup>

- (1) If pre-merger market shares remained the same, industry output would be unchanged as a result of the merger and there would be no welfare consequences whatsoever;
- (2) Market shares are likely to change as a result of the merger, rendering the  $2s_1s_2$  formula an incorrect assessment of the likely change in concentration.

This suggests that merger analysis, if it is to have any bite, must reach a conclusion regarding the behavioural impact of a merger – that is, how it will change the outputs of firms in the industry.

It is sometimes presumed that increases in  $H$  are necessarily accompanied by a reduction in social welfare. This presumption, however, relies on some very special industry conditions:

- In a static analysis, if the  $n$  firms in an industry are equally efficient, quantity-setting oligopolists with constant marginal cost, welfare is increasing in  $n$  while  $H = 1/n$ . Therefore, a merger, by reducing  $n$ , necessarily increases  $H$  and reduces welfare.<sup>5</sup>
- In a dynamic analysis, if a decrease in  $n$  makes it more likely that the remaining firms achieve a tacitly collusive outcome, welfare could fall as a result of the merger. Once again, if firms are symmetric, then  $H$  and  $n$  have a negative relationship so that an increase in  $H$  is undesirable.

The real world does not easily correspond to these simple cases. Each relies on a view of the world that has industries composed of firms of equal size. This is rarely the case.<sup>6</sup> When firms have asymmetric sizes, the presumption of a negative relationship between concentration and welfare lacks a conceptual foundation.<sup>7</sup>

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<sup>4</sup> See Farrell and Shapiro (1990)

<sup>5</sup> Note that in price-setting oligopoly this conclusion will only arise if there is significant product differentiation. However, given that such differentiation has itself ambiguous implications for consumers, it is difficult to offer a simple welfare conclusion from the model.

<sup>6</sup> Gans and Quiggin (1997).

<sup>7</sup> Stiglitz (1987) finds that duopolies might be more competitive than other market structures even when firms are of equal size. He considers a situation in which consumers are not fully informed of the range of prices on offer and must search. As search is costly, when there are more firms, each can afford to raise its price. The result is a distribution of prices – some monopolistic, some competitive. When there are only two firms prices are on average more competitive.

When there are asymmetries among firms, while decreases in output are welfare reducing (that is, they lead to allocative inefficiencies or dead-weight losses), increases in concentration improve welfare. This is because, in equilibrium, larger firms have lower marginal costs. So if output is concentrated among those larger firms, this necessarily means it is produced more efficiently.<sup>8</sup>

Mergers, therefore, involve a trade-off. Without any offsetting cost reductions from synergies and the like, such mergers lead to lower output. This is because any reduction in output by the merged firm is not completely offset by output expansion by rivals outside the merger. However, when outsiders are highly concentrated, the reallocation of industry output towards them improves industry productivity and hence, social welfare. This latter effect underpins Demsetz's (1974) critique of the structuralist approach.

### 1.2 A Simple Example

In order to demonstrate the ambiguous relationship between concentration and welfare, it is worthwhile to consider a simple formal example. Suppose that (inverse) market demand is given by  $P = 10 - (q_1 + q_2)$  and that firm 1 has a constant marginal cost of 0 while firm 2's marginal cost is  $c$ .

In this case, if firms 1 and 2 compete as (Cournot) quantity-setting oligopolists, industry output is  $(20 - c)/3$  and price is  $(10 + c)/3$ . However, if firms 1 and 2 merge to form a monopoly, they rationalise production and produce at firm 1's marginal cost. In this case, output falls to 5 and price also becomes 5.<sup>9</sup> However, while output is lower under monopoly it is produced more efficiently. Average cost for the industry is 0 under monopoly and is  $2(5-c)/(20-c)$  under duopoly. This cost differential is largest for higher levels of  $c$ .

What happens to social welfare following the merger? A simple calculation demonstrates that the sum of consumer and producer surplus is higher under duopoly than monopoly if and only if  $c$  is less than  $25/11$ . When the cost differential is larger than this monopoly is socially preferable to duopoly.

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<sup>8</sup> Salant and Shaffer (1999) explore this issue in considerable detail. They find that socially desirable outcomes often require firm size asymmetries. Their analysis, however, takes place in an environment where output is unchanged. They write:

Ironically, although the courts regard the HHI as superior to other measures of market concentration precisely because "it increases as the disparity in the size between firms increases" (*FTC v. PPG Indus.* 798 F.2d 1500, 1503, D.C. Cir. 1986), it is precisely this sensitivity to disparities between firms which can undermine the reliability of this index as an indicator of social welfare. (pp.589-590)

<sup>9</sup> Output has fallen as 2 produces a positive amount only if  $c < 5$ . So the lowest level of output under duopoly is  $15/3$  or 5.

This example dramatically illustrates that, in industries with asymmetric firm sizes, even the presumption that duopoly involves higher social welfare than monopoly is misplaced. In the above example,  $H$  could have increased from as low as 0.573 to 1 (an increase of 75 percent) and still resulted in welfare improvements.<sup>10</sup>

### 1.3 Competition and Concentration

The above analysis demonstrates that greater concentration can be associated with higher social welfare. But what industry conditions make this positive relationship more likely? This is a difficult question and economic theory provides no general answer. However, when one uses the fact that any proposed merger is likely to be considered as privately profitable, it is possible to gain a clearer understanding of the issue.

In the absence of synergies, mergers can be privately profitable for two reasons:

- Reduction in *business stealing*: the merged firm will choose its strategies in such a way that minimises any negative externalities that might have previously existed, especially those resulting from competition between them.
- Production *rationalisation*: the merged firms will be able to re-organise production to take into account any differences in marginal costs among firms.

From a social welfare perspective, however, a merger is desirable if the business stealing effect is minimised and production rationalisation *industry-wide* is encouraged.

The business stealing (or “market power”) motivation is not salient if rivals (or “outsiders”) will respond aggressively to any contraction in output (i.e., price increases) by the merged firm.

- If an aggressive competitive response is likely, this means that a privately desirable merger is motivated more by efficiencies than a greater exercise of market power. Hence, it can be deemed to have a net social benefit.
- Moreover, such an aggressive competitive response, if it is undertaken by more productive firms results in a reduction in average production costs in the industry.

Therefore, high concentration is most likely to lead to welfare improvements when there is an aggressive competitive response by outsiders.

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<sup>10</sup> Gans and Quiggin (1997) demonstrate that a similar effect is possible even in a perfectly contestable market.

An aggressive competitive response is likely if there is an outsider whose willingness and ability to expand output without depressing market price is sensitive to the output choice of the merged firm. This occurs when<sup>11</sup>

- *Marginal cost is less sensitive to output changes*: in this case, the costs of outside firms will not rise dramatically as output rises. Hence, they will have high incentives to expand output as the merged firm attempts to exercise any market power.
- *Market demand is less elastic*: if market demand is less elastic, industry-wide mark-ups are higher.<sup>12</sup> In particular, the expansion strategies of large firms will be less likely to depress price. Hence, they will have high incentives to produce more in response to output contractions by the merged firm.
- *Pre-merger market shares of outsiders is larger*: when smaller firms merge, their ability to exercise market power as a result is diluted. Hence, given that they are merging, it indicates production rationalisation motives rather than some anti-competitive intent.

If these factors are satisfied then the industry-wide production rationalisation benefits that flow from a proposed merger exceed the costs that might arise from greater market power of the merged firm. This is because an aggressive competitive response is more likely and desirable under these conditions.

#### 1.4 Conclusion

Simple use of concentration measures is unlikely to be informative about the social desirability of a merger. This is because such measures neglect why market shares may be as they are in the first place. Consequently, more critical information will arise from an analysis of whether those outside the merger are likely to respond aggressively to contractions in output among the merging parties. Economic theory has some insight into when an aggressive competitive response is likely but, in practice, the analysis will take place on a case by case basis. Therefore, simple quantitative rules based on market shares will not be desirable in terms of establishing merger guidelines. As will be demonstrated, this insight is crucial in evaluating arguments for competitive balance as such mergers always increase concentration. Nonetheless, it will be demonstrated that market share information can, under some circumstances, play a role in establishing whether a merger is likely to be socially desirable.

## 2. The Competitive Balance Argument for Mergers

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<sup>11</sup> See Farrell and Shapiro (1990).

<sup>12</sup> Farrell and Shapiro (1990) and McAfee and Williams (1992). In addition, larger firms are able to expand their use of investments in advertising and research and development, to lower the elasticity of demand they face. Once again, this raises their relative mark-ups, making output expansion by them socially desirable.

Suppose that a merger was to lead to a merged firm that approximately equalled the size of the largest firm in an industry. As discussed previously, a presumption that increases in concentration are necessarily welfare reducing, leads one to prefer three firms in an industry to two regardless of issues of changes in relative size. However, given that size asymmetries tell us something about relative costs, this conclusion is not obvious. It could easily be the case that two large firms generate higher social welfare than one large and two medium sized firms. That is, *competitive balance* may be preferred to lower concentration.

### 2.1 Aggressive Competitive Responses

To frame the social question, here we can ask a more specific question: *is an aggressive competitive response more likely when firms outside the merger are more concentrated?* The previous analysis suggests that larger, and hence more efficient, firms are more *able* to expand their output. However, are they more *willing* to do so? That is, when do larger, as opposed to smaller, outsider firms have an incentive to respond aggressively to output contractions by the merged firm?

### 2.2 A Simple Quantitative Test

Economic theory presents no clear conclusion on this issue. In some situations, smaller, more fragmented, outsiders have greater incentives to expand output in response to contractions by the merged firm.<sup>13</sup> In others, the opposite is true. The production rationalisation effect works to make larger firms more aggressive competitors. For the case of linear demand and quadratic costs, Farrell and Shapiro (1990) demonstrate that a privately profitable merger is also socially desirable if the following condition is satisfied:

$$s_1 + s_2 \leq \frac{1}{e} \sum_{i \in O} s_i^2,$$

where  $s_i$  is the pre-merger market share of firm  $i$ , 1 and 2 are the firms merging,  $O$  is the set of outside firms (other than 1 and 2), and  $e$  is the price elasticity of market demand. Notice that, as concentration among outsiders increases, it is more likely that a merger will be socially desirable.<sup>14</sup> This is

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<sup>13</sup> Farrell and Shapiro (1990) consider an example where market demand has a constant elasticity and marginal costs are constant and demonstrate that higher outside concentration reduces the social case for a merger.

<sup>14</sup> This result is contingent upon the assumed environment. For instance, Farrell and Shapiro (1990) show that with constant-elasticity demand and constant marginal costs, a merger is socially desirable if and only if:

$$2(s_1 + s_2) < 1 - \left(1 + \frac{1}{e}\right) \sum_{i \in O} s_i^2.$$

because, in this environment, larger firms are more likely than smaller ones to mount an aggressive competitive response in the face of a merger. Hence, if the merged firm were to reduce output, when there is a larger firm present, it will respond competitively and make up for some of that output reduction. This means that if a merger were to be proposed when outsiders are highly concentrated, it is more likely to be based on socially beneficial motives (such as cost reduction) rather than an attempt by the merging firms to increase their ability to exercise market power.

Note that if the merging firms comprise more than 50% of the pre-merger market, the merger will not<sup>15</sup> be socially desirable (unless there are offsetting cost efficiencies).<sup>16</sup>

### 2.3 Conclusion

The question of whether competitive balance can lead to higher social welfare hinges on the likelihood that large as opposed to small firms are more willing and able to mount an aggressive competitive response. The literature does not conclusively resolve this issue. Nonetheless, as Farrell and Shapiro (1990) have demonstrated, for many reasonable sets of assumptions, privately profitable mergers are likely to be socially beneficial when outsiders are more concentrated. This supports a competitive balance argument.<sup>17</sup>

## 3. Tacit Collusion and Concentration

The previous analysis is essentially static, being based on the Cournot model of quantity competition among oligopolists. In particular, it is assumed that firms continue to behave as Cournot competitors after the merger. Thus, it does not consider the effect of the merger on the probability of more collusive behaviour.

### 3.1 Cournot Competition as Tacit Collusion

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Notice that a merger is less likely to be approved as outsiders become more concentrated. However, the constant cost case is special and does not capture the asset-combination effect of mergers (see Pery and Porter, 1985).

<sup>15</sup> This quadratic cost case stands in contrast to the simple illustration in Section 1 that involved constant marginal costs.

<sup>16</sup> This result is proven by McAfee and Williams (1992). Levin (1990) goes further. In a general model, he demonstrates that any privately profitable merger will be socially desirable so long as the merged firms comprise less than 50% of the pre-merger market.

<sup>17</sup> A more difficult issue is how to evaluate two merger proposals at the same time for their overall impact on welfare. Barros (1997) analyses this problem. He finds that independent evaluation of the merger proposals leads to more mergers being approved than would be socially desirable. On the other hand, if mergers are evaluated jointly, too few mergers are approved. Nilssen and Sorgard (1998) derive a similar set of conclusions.

The ACCC has been concerned about the possibility that a merger might facilitate tacit collusion. In its decision not to authorise the merger between Wattyl and Taubmans,<sup>18</sup> it found that competition among duopolists was unlikely to be intense.

The duopolists will quickly recognise their interdependence. Should either firm engage in price competition to increase market share, it would quickly face a similar response from its competitor. Given the relatively inelastic demand for the product, price competition is likely to result in lower revenues and profits for both firms. (p.8)

The ACCC's reasoning here is precisely one of Cournot conjectures for both firms. That is, each firm recognises that if it reduces its price, the other firm is likely to reduce its price rather than scale back its quantity in response – i.e., that is, quantity rather than price is held fixed. Firms are, therefore, less likely to engage in price discounting to improve market shares. As such, according to Farrell and Shapiro (1990), “[w]e believe that the Cournot model captures the notion of tacit collusion fairly well.”

In this respect, the reduction in competition that takes place within a Cournot framework is consistent with the reduction that the ACCC considers the appropriate model of oligopolistic behaviour. This suggests that the previous analysis captures well the magnitude of anti-competitive effects the ACCC would be concerned about.

### 3.2 *Tacit Collusion in Repeated Interactions*

It is sometimes the case that tacit collusion is viewed as more extreme than Cournot competition. It is argued that when interactions are repeated over time, this model may not be the most appropriate representation of strategic behaviour. Indeed, it may be possible for firms to tacitly agree to keep quantities low in order to keep prices high. As mentioned earlier, such tacit collusion or conscious parallelism is a reason behind the presumption that an increase in concentration is associated with welfare reducing anti-competitive outcomes.

Like the relationship between concentration and welfare in a static game, the relationship between these in a repeated game is unclear. While, in general, drastic reductions in the number of firms in an industry are thought to make tacit collusion more likely (or sustainable), this conclusion is far from clear for small changes in firm numbers.

In particular, while conscious parallelism clearly seems to be more likely the smaller the number of firms (other things equal), economic analysis has no serious idea as to whether the danger point is reached at four firms rather

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<sup>18</sup> *Wattyl (Australia) Pty Limited, Courtaulds (Australia) Pty Limited & Ors* (1996) ATPR (Com) 50-232.

than five or, indeed, what the function in question looks like. Similarly, while conscious parallelism clearly seems to be more likely the more concentrated is the market (other things equal), no sound reason exists for picking out particular levels of the Herfindahl-Hirschman Index (HHI) as danger points. (Fisher, 1987, pp.30-31)

Therefore, if one were to reduce the number of competitors in an industry by a single firm, without further information on the sizes of firm it is difficult to assess whether tacit collusion is more likely.<sup>19</sup>

### 3.3 *The Basics of Tacit Collusion in a Repeated Context*

Tacit collusion occurs where firms reach an implicit ‘understanding’ that if any one of them were to compete aggressively (e.g., by lowering prices or stealing other firm’s customers), this would trigger a very competitive response from other firms (e.g., a price war).<sup>20</sup> To avoid such situations firms refrain from competitive actions and sustain higher prices and profits than would otherwise be the case.

In order to achieve this tacit outcome, the ‘punishment’ for competitive behaviour must be credible. This has two broad requirements:

- *Ease of detection of cheating*: it must be easy for firms to distinguish competitive behaviour from other forces (e.g., demand shifts). This is easier when there are fewer firms selling similar products.
- *Incentives to punish*: competitive actions that constitute effective punishment must not be too costly to undertake. Such punishment is not costly when large numbers of firms coordinate.

Therefore, in order to examine the link between concentration and the likelihood of tacit collusion, its impact on these two requirements must be considered.

### 3.4 *The Role of Switching Costs*

Perhaps the simplest framework in which to analyse the likelihood of tacit collusion assumes that consumers have switching costs in changing firms. That is, for some reason, it is more difficult for firms to compete for another firm’s customers than for new customers.

Consider the incentives of firms when there is a single large firm in this environment. While that firm has limited incentives to compete aggressively – as it loses profits on existing ‘locked-in’ customers – smaller firms have the

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<sup>19</sup> See Bresnahan (1989) for a review of the empirical literature.

<sup>20</sup> Note that this is a more extreme form of response than in the Cournot model. In the repeated game, prices are reduced to marginal cost rather than incrementally.

opposite incentive. They can compete aggressively for new customers, as they do not have as large an existing customer base. Hence, in this environment, firm size asymmetries reduce the ability of firms to sustain tacitly collusive outcomes.<sup>21</sup>

This assumes, however, that firms cannot discriminate between the price they sell to existing customers and the price they sell to new ones. In many industries, however, such discrimination is possible. In this case, large firms can compete for new customers without sacrificing profit margins on existing customers. This makes them relatively more aggressive competitively. Smaller firms will, therefore, fear an aggressive response to their own competitive strategies. By refraining from these they reduce effective competition in the industry. Such an aggressive response may have a smaller effect on a large firm.<sup>22</sup>

Hence, the ability of firms to price discriminate between new and existing customers has implications for whether tacit collusion is more likely when there is a dominant firm versus competitive balance.

### 3.5 *Relative Size and Tacit Collusion*

Economic theory is divided on the relationship between relative size and tacit collusion. There are two competing hypotheses:

- *Tacit collusion is more likely with equal firm sizes*: it is a general proposition in economics that as the number of equal-sized firms in an industry falls, tacit collusion becomes easier to sustain. When firms are of equal size, there are no asymmetries in the incentive to punish other firms for cheating. This is in contrast to the situation in which there are some smaller firms who can safely chip away at larger firms' market share without provoking a price war or other punishment phase.<sup>23</sup>

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<sup>21</sup> See Klemperer (1995).

<sup>22</sup> Daughety (1990) argues that mergers that create additional market leaders are pro-competitive.

<sup>23</sup> The ACCC gave some thought on this issue in its *Wattyl* decision. There is evaluated the merger for two medium size firms (Wattyl and Taubmans) to bring an triopoly to a duopoly with two equal sized firms. It was not convinced that the large firm (Dulux) dominated the market in the pre-merger structure. Although, curiously they cited as evidence of this the fact that "Dulux's market share has fallen since its acquisition of British Paints in 1988 while the market share of Wattyl has increased from 15 per cent to 28 per cent since 1988." (p.6). This is indicative of the previous merger providing Dulux with some market power. Indeed, it also suggests that another merger would result in industry-wide production rationalisation. However, this possibility was not considered by the Commission.

The Commission appeared to favour the hypothesis that a decreasing in the number of firms from three to two would result in collusion: "The Commission has given considerable attention to the claim that competition will be enhanced by a duopoly market structure and finds such an argument implausible. The duopolists would quickly recognise their interdependence. Should either firm engage in price competition to increase market share, it would quickly face a similar response from its competitor. Given the relatively inelastic demand for the product, price competition is likely to result in lower revenues and profits for both firms." (p.8). However, while it is plausible that a duopoly could reach a tacitly collusive outcome it is not clear why their ability to do so is so much greater than a

- *Tacit collusion is more likely with a dominant firm*: Having two large firms of similar size reduces the dominant leadership potential of a single large firm. Thus, it becomes harder to coordinate pricing and customer sharing relationships.<sup>24</sup>

While the prevalence of switching costs provides support for the first hypothesis, when firms can price discriminate between new and existing customers, the second hypothesis can be supported.

#### 4. Conclusions

This paper has considered the competitive effects of mergers from a behaviourist perspective. This approach casts doubt on the simple use of concentration measures as indicators of social welfare. This is because such concentration measures fail to take into account output changes among firms following a merger. When firms are of different sizes, industry-wide average costs are lower when output is concentrated among larger firms.

The analysis of this paper has several implications:

1. There is no simple relationship between concentration and welfare.

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situation with three firms. The Commission did recognise that “the creation of one firm with a large market share may increase the likelihood of price leadership.” (p.51)

Interestingly, the Commission provided as support for its view the article by MacAvoy (1995). The Commission argued that “MacAvoy found that when one firm was dominant, the best pricing strategy for its two competitors was one which would increase their market shares. The outcome of such a strategy would be that shares would become more equal as the price cost margins decreased. However, when the shares of the second and third firms increased to levels comparable to that of the first, price competition decreased and prices in the market converged over time at a higher than competitive level.” (p.58) They argued that, despite the different market – the partially regulated long-distance telephony market in the U.S. – this research provided evidence that collusion was less likely when firm sizes were different. However, as MacAvoy himself states (p.151), one firm (AT&T) had over twice the market share of the next highest firm (MCI) with 65% of the market. Therefore, collusive outcomes occurred in an industry without equal sized firms. What MacAvoy demonstrated was that it is stability in the competitive environment that led to collusive outcomes as opposed to concentration per se. What this suggests is that whether there are two equal sized or three non-equal sized firms does not matter as much for the likelihood of tacit collusion than stability per se.

<sup>24</sup> In its *Bristle* decision (ACCC Determination: Application for Authorisation, Bristle Holdings Limited, November 3, 1997, Authorisation No.A70010), the ACCC recognised the possibility that a merger could facilitate competitive balance and some of the tensions discussed here: “A reduction in the number of firms operating in a market increases the scope for co-ordinated conduct, including both overt and tacit collusion. It becomes easier to reach agreement on the terms of co-ordination, to signal intentions to other market participants and to monitor behaviour. More even market shares may increase the commonality of interest between market participants in some circumstances. In other situations, the creation of one firm with a large market share may increase the likelihood of price leadership.” (5.14)

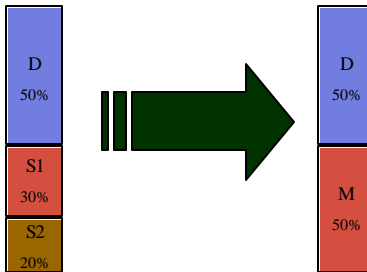
- Increases in concentration can improve social welfare when firms are of different sizes and outside firms are likely to respond aggressively to contractions in output by the merged firm.
  - An argument for competitive balance can be supported by evidence that larger firms are more likely to mount aggressive competitive responses.
2. If mergers result in an increase in the likelihood of tacit collusion, this raises additional market power concerns.
- While economic theory suggests that increases in concentration raise the likelihood of tacitly collusive outcomes, for small changes in firm numbers it is not clear this would be significant.
  - When firm size differences are considered, economic theory is divided on whether two equal sized firms will lead to more collusive outcomes than when there is a single dominant firm.
3. If a regulator has a choice of mergers and only a single merger is permitted in an industry, the analysis suggests that the anti-competitive costs of a merger are minimised if outside firms are large and likely to expand their output as a result.
- In short, the firms left outside the merger should be those most likely to respond aggressively to output contraction by the merged firm.

This analysis complements merger analyses that include cost reductions achieved by the merging firms (Williamson, 1968; Farrell and Shapiro, 1990). When such intra-firm efficiencies are possible, mergers may result in industry-wide price decreases as well as the industry-wide production rationalisation emphasised in this paper.

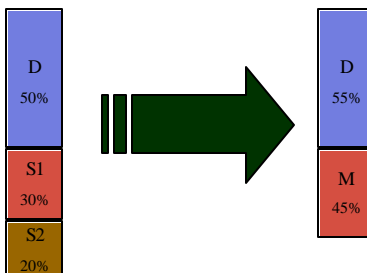
In conclusion, it is very possible that a merger between two relatively small firms in an industry with at least one dominant firm could be pro-competitive: supporting arguments based on competitive balance. However, this argument rests on an assumption that the dominant firm is large precisely because it has significant marginal cost advantages over smaller firms in the industry. This is because, under those circumstances, a dominant firm may take advantage of the possible output reductions of the merged firm by expanding its own output thereby reducing average variable production costs in the industry. However, if a firm is dominant for historical reasons, say, because it had a regulated monopoly position in the past, then it is less likely that such an argument – based on the restoration of competitive balance – will have grounding as a matter of economic theory.

## Figures

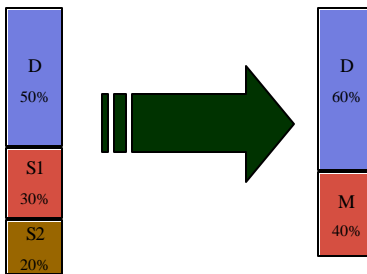
### 1. Proposed



### 2. Regulatory Fear



### 3. Reality?



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