The BAT/Protabaco merger: unilateral effects, tacit collusion and multimarket oligopoly

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Introduction

Last year Philip Morris International (PMI), the largest cigarette vendor and tobacco purchaser in Colombia, attempted to purchase Colombia's second-largest tobacco company—Protabaco—for a price of US $425 million. Had the merger gone ahead it would have created a single company with a 78 per cent share of cigarette sales in Colombia, and a monopsony in the purchase of tobacco from Colombia's 20,000-odd small tobacco farmers.[1]

In reviewing the proposed acquisition, Colombia's competition authority—the Superintendencia of Industry and Commerce (SIC)—raised a number of objections. First, it found that the merger would result in a probable increase in prices of 4 per cent in the medium-to-low segment of the market, which includes the popular brands Mustang, Boston, Belmont, Premier, Derby and Piel Roja among others, and increase the Herfindhal-Hirschman Index (HHI) in this segment from an already high level of 3,868 to a near-monopoly level of 7,199.[2]

Secondly, the SIC expressed concerns about the types of contractual conditions the two largest tobacco companies impose on small tobacco farmers in Colombia. Specifically, clauses that make the purchase of a farmer's tobacco conditional upon agreeing to debt-financing schemes under the control of the companies, and prohibitions which might prevent farmers from planting other products. The SIC was concerned that the merger-to-monopsony in tobacco purchasing might worsen the situation of Colombia's small tobacco farmers, by restricting competition further and opening the door to potential abuses of the company's market power.

Finally, the SIC was concerned about certain types of exclusivity clauses in the contractual arrangements between the tobacco companies and their distributors, and imposed restrictions on such arrangements as a precondition for allowing the merger.

The conditions imposed by the SIC, which included the divestiture by the merged company of at least two important brands, eventually dissuaded Philip Morris from pursuing the acquisition. A year later, Colombia's third-largest tobacco company, British American Tobacco (BAT) has announced its intention to purchase 100 per cent of Protabaco for a price of US $452 million. But should this proposed acquisition raise fewer concerns about the concentration of market power in Colombia's tobacco market than the previous one?

One consideration is that BAT's overall market-share in cigarette sales in Colombia is much smaller than PMI's—20.7 per cent compared with PMI's 49.9 per cent in 2009. And BAT's sales are heavily concentrated in the "high" or "premium" segment of the market, where it has a 54 per cent market share, and in which Protabaco has no market presence at all. In the low-to-medium segment, BAT's market share in 2009 was just 15 per cent (including its brands Belmont, Delta, Montana and Pall Mall), while Protabaco's market share was 33 per cent. So the concentration in cigarette sales, even in this segment, is much smaller. Finally, BAT currently purchases little or no tobacco from Colombian tobacco farmers, implying that the proposed acquisition should have a negligible effect on upstream market concentration in tobacco purchasing in Colombia.

Does all of this mean that the SIC should raise fewer objections to BAT's purchase of Protabaco than it did in the case of PMI?

When economists analyse mergers they usually consider three possible effects. First, the merger's "static" or "unilateral" effects on prices and competition by reducing the number of competitors in the market. Secondly, the potential for the merger to facilitate tacit or explicit collusion between the remaining firms (known as the merger's "coordinated" effects in antitrust jargon). And thirdly, the likely efficiency benefits of the merger which may offset the negative effects mentioned immediately above. The balancing of the anti-competitive price effects and potentially pro-competitive efficiency effects is central to merger analysis.[3]

[1] See Ministry of Commerce, Industry and Tourism, Superintendency of Industry and Commerce Resolution 29937 of 2010 (June 11, 2010) for the Colombian market-share information reported in the text of this article.
[2] The SIC divided the Colombian retail cigarette market into two segments in its analysis: the "high" or "premium" segment consisting of brands such Marlboro, Royal and Imperial manufactured by PMI and Kool, Kent and Lucky Strike manufactured by BAT, which sell at prices exceeding COP $2,700 (pesos); and the "medium-to-low" segment consisting of all other brands which typically sell for prices less than COP $2,000 (pesos).
[3] See M.D. Whinston, *Lectures on Antitrust Economics* (Cambridge, MA: MIT Press, 2006), Ch.3 and M. Motta, *Competition Policy: Theory and Practice* (Cambridge University Press, 2004), Ch.5 for extremely useful discussions of merger economics and policy generally.

Unilateral price effects and efficiency gains

After a merger, firms have unilateral incentives to raise prices for at least two reasons. First, ex post market concentration increases and market competitiveness decreases, increasing firms' ability to profitably set higher markups. Secondly, in markets where multi-product firms sell differentiated products (such as cigarettes), a fraction of customers who before the merger would have been lost to competitors in response to a unilateral increase in price of a single brand, are retained post merger because they switch to another brand owned by the newly-merged firm.[4]

These two effects mean that most standard economic models of differentiated product industries will predict price increases following a merger. It is often suggested, however, that post-merger efficiency gains—due to the replacement of inefficient technologies for better ones or better management practices of the merged firm, for example—will reduce marginal costs and hence firms' incentives to increase prices. Companies often claim large efficiency gains following a merger, and argue that these need to be taken into account.[5]

In an attempt to quantify these effects for the proposed acquisition, we simulated the merger between BAT and Protabaco using a PCAIDS model as suggested by R. Epstein and D. Rubinfeld, "Merger simulation: a simplified approach with new applications" (2002) 69(3) *Antitrust Law Journal* 883.[6] Since some of the key variables required by the model are difficult to estimate with confidence (e.g. the industry price and individual brand elasticities, the scaling parameter, and efficiency gains—measured as post merger reduction in marginal costs), we carried out a sensitivity analysis around these variables. Figure 1 below reports the predicted average price increases for the brands of each dominant firm weighted by post-merger market shares under a variety of assumptions concerning the reference brand elasticity.[7]

In figure 1, the market elasticity of demand is assumed to be -1 and the scaling parameter 0.5.[8] BAT's Belmont brand was used as the reference brand. Once this own-price elasticity is fixed, the model's assumptions allow all other elasticities to be determined, as well as the post-merger market shares.
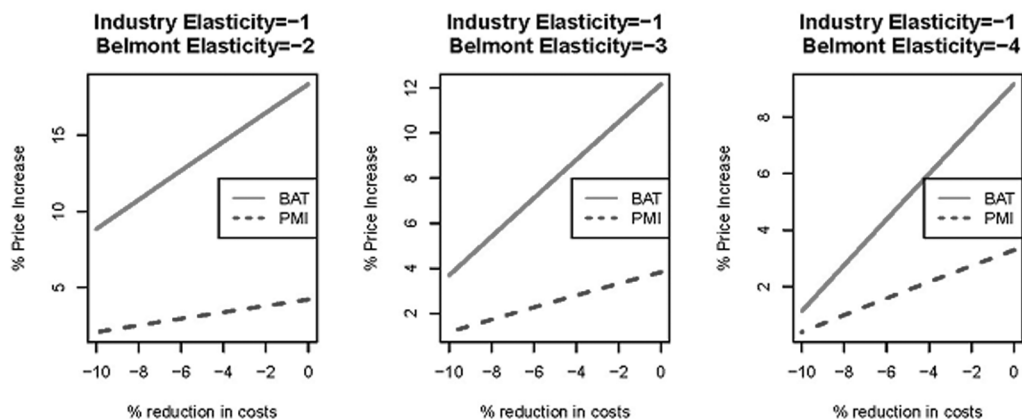

Figure 1: PCAIDS model results

As is evident from the figure, our simulation model predicts noteworthy post-merger average price increases for brands of both the post-merger dominant firms, BAT and PMI, under a variety of model parameters. In particular, BAT's average price increase is between 1 per cent and 8 per cent in all scenarios even when we allow for post-merger efficiency gains to reduce marginal costs by up to 10 per cent. In the absence of significant efficiency gains, the predicted price increases are much larger.

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[4] The ratio of the change in demand for brand B over brand A following an increase in the price of brand A is known as the "diversion ratio". Diversion ratios form the basis for the recently proposed "Farrell-Shapiro test" for example, aimed at measuring the "upward pricing pressure" resulting from mergers in differentiated product industries. See J. Farrell and C. Shapiro, "Antitrust evaluation of horizontal mergers: an economic alternative to market definition" (2010) 10(1) *B.E. Journal of Theoretical Economics, Policies and Perspectives* art.9.

[5] Although notably, according to the SIC, neither PMI nor Protabaco were able to provide convincing information on this score in their merger case.

[6] In recent years there has been increasing interest in the use of empirical economic and simulation models to predict the unilateral price effects of mergers: nested logit models, the Farrell-Shapiro test and AIDS models are among the toolkit. The "proportionally calibrated almost ideal demand system" (PCAIDS) is a standard model which requires less information than many others. A key assumption in this model is that the share of total revenue lost by one brand as a result of an increase in its price is allocated to the other brands in proportion to their respective revenue shares. It follows that the only information needed to run a PCAIDS simulation analysis is market shares, the industry price elasticity of demand and the price elasticity of one "reference" brand. To allow for deviations from the proportionality assumption between product segments (low-to-medium and high), we introduce a scaling parameter between 0 and 1, as suggested by R. Epstein and D. Rubinfeld, "Merger simulation: a simplified approach with new applications" (2002) 69(3) *Antitrust Law Journal* 883. The role of this parameter is to reduce the degree of substitution between brands in different segments. For example, if the scaling parameter is 0.75 then the market share lost by a brand in one segment as a result of an increase in its price is allocated to brands in the other segment according to the proportionality assumption scaled by 0.75. No scaling is applied within segments.

[7] Pre-merger market-share information for December 2010 was used in the simulations. All data was sourced from Euromonitor International, *Cigarettes: Latin America* (2010).

[8] Results for alternative values of the market elasticity and scaling parameter are similar and available from the authors on request. From its review of the literature, the SIC concluded that a market elasticity of -0.54 was reasonable (representing the average elasticity in countries such as the United States, Argentina and Mexico). Hence our assumption is conservative.

Tacit collusion and multimarket contact

The analysis described above focuses on the unilateral effects of the BAT/Protabaco merger. In a dynamic context in which firms interact repeatedly and tacit collusion is possible, a merger can affect prices not only by changing within-market concentration, but by changing the degree to which co-ordination on pricing is possible, in one or more markets.

Compte et al emphasise two factors.[9] On the one hand, a merger reduces the number of competitors in the market, which tends to facilitate collusion. This well-known effect dominates when firms' capacity constraints are not too severe, implying that any merger facilitates collusion, and is larger the smaller the number of participants already left in the market.[10] On the other hand, if a merger involves the largest firm in the market, such as PMI's proposed acquisition of Protabaco, the market asymmetry in capacities is increased, which can make collusion harder. This effect matters when the capacity constraints are more severe, or when their distribution is very asymmetric.[11] The Compte et al. analysis thus suggests that—contrary to the conventional wisdom—capacity asymmetry may be pro-competitive as it makes tacit collusion more difficult to sustain. Conversely, greater symmetry in market shares or capacities may facilitate collusive conduct. A more equal distribution of assets relaxes firms' incentive constraints and this makes collusion easier.[12]

One interesting implication of this is that although the acquisition of Protabaco by PMI would have resulted in a significant concentration in market capacities, it could have had a countervailing pro-competitive effect by making tacit collusion harder to sustain. The acquisition of Protabaco by BAT, on the other hand, will result in a duopoly market in which the two remaining firms will have roughly equal market shares in each market segment.[13] This means that the BAT/Protabaco merger's effects on market competitiveness may be much more negative than is evident from looking at standard concentration indices or unilateral effects alone, and these effects were arguably absent in the previous case.[14]

Finally, the extent to which multi-product firms compete against each other in multiple markets can also affect their ability to behave co-operatively, or successfully co-ordinate on prices. Bernheim and Whinston[15] have shown that, in certain cases, multimarket contact can improve firms' ability to sustain high prices by pooling the incentive constraints which limit tacit collusion.[16] In particular, where two firms compete as duopolists in two or more markets with different market shares in each Motta[17] observes that multimarket contact can help to smooth the market asymmetries, making the incentive constraints more symmetric, and this facilitates collusion.

If BAT succeeds in its purchase of Protabaco, PMI and BAT will share national tobacco markets in Colombia, Mexico, Venezuela, Peru, Ecuador, Chile, Argentina and Brazil, with very different market shares in each. In Chile and Venezuela, for example, BAT is a near monopolist with market shares exceeding 95 per cent; in Brazil, BAT's market share is 87 per cent and PMI's 11 per cent; in Argentina and Mexico PMI is the dominant firm, with market shares of 73.8 per cent and 65.3 per cent respectively, compared with BAT's shares of 20.2 per cent and 22.5 per cent. Following a purchase of Protabaco by BAT in Colombia, each company will have close to 50 per cent of the market as noted above. This degree of duopolistic market sharing across a number of differing markets potentially has important negative consequences for consumers in these countries.

Conclusion

While the proposed merger between Protabaco and BAT might appear at first glance to raise fewer competition concerns than the PMI acquisition, a preliminary economic analysis suggests that this is not case. Our estimated post-merger price increases (or "unilateral effects") are significant, even when we allow for marginal-cost reducing efficiency gains of up to 10 per cent. And the post-merger market-share symmetry between the two remaining firms, combined with concerns about facilitating multimarket collusion or co-operative behaviour, substantially reinforce these worries. In the absence of hard evidence of efficiency gains which will directly benefit Colombian consumers, our analysis suggests that the acquisition should be subjected to serious antitrust scrutiny. On August 2, 2011 the SIC approved the merger, however, evidently on the basis of an analysis

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[9] O. Compte, F. Jenny and P. Rey, "Capacity constraints, mergers and collusion" (2002) 46 *European Economic Review* 1.

[10] See also the Ivaldi et al, *Report on collusion for the European Commission* (2003), s.V.

[11] This is because, when capacity constraints matter, the key problem for sustaining tacit collusion is to prevent the largest firm from deviating from a collusive agreement. A merger involving the largest firm reduces smaller firms' ability to retaliate (by transferring some of their capacity to the largest firm), and may increase the larger firm's gains from a deviation if it was initially capacity-constrained.

[12] See K.U. Kuhn and M. Motta, *The economics of joint dominance* (Florence: European University Institute, 1999) and Motta, *Competition Policy*, 2004, pp.147–48. In a model of differentiated products which allows him to study the price effects of mergers, Kai-Uwe Kühn, *The co-ordinated effects of mergers in differentiated products markets* (London: University of Michigan and CEPR, 2004) similarly shows that asset acquisitions by the smallest firm in the market (including mergers) will facilitate collusion and raise the most profitable collusive price, while asset acquisitions by the largest firm will tend to undermine collusion and lower the most profitable collusive price.

[13] The market shares for BAT and PMI in the Colombian cigarette market taken as a whole post-merger will be 48.9 per cent and 49.9 per cent respectively (based on the SIC's 2009 figures), compared with 20.7 per cent versus 49.9 per cent pre-merger. In the "high" or "premium" segment their post-merger share will be 53.8 per cent and 46.2 per cent respectively, similar to the pre-merger shares. In the "medium to low" segment their post-merger shares will be 48 per cent and 50.5 per cent respectively, versus 15 per cent and 50.5 per cent pre merger. Hence the merger will result in a significant equalisation in the companies' market positions by this measure.

[14] The Compte, Jenny and Rey, "Capacity constraints, mergers and collusion" (2002) 46 *European Economic Review* 1, s.5 analysis of the Nestle-Perrier merger case in France reinforces this point, and suggests that the SIC's requirement of a divestiture of brands by a merged PMI/Protabaco may have been counterproductive from this point of view.

[15] D.B. Bernheim and M.D. Whinston, "Multimarket contact and collusive behavior" (1990) 21(1) *RAND Journal of Economics*.

[16] See also Motta, *Competition Policy*, (Cambridge University Press, 2004) pp.148–49; pp.165–66.

[17] Motta, *Competition Policy*, (Cambridge University Press, 2004) p.149.

of post-merger market shares alone. They do not appear to have analysed unilateral effects, nor considered the issues of tacit collusion or multimarket effects in their decision.