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Agenda

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Great expectations: does stock market data have a role in competition policy?

Can the stock market be a 'prediction market' for competition policy, much as a betting exchange will forecast the outcome of a horse race? In principle, watching how share prices react to merger announcements should provide useful information to competition authorities on expected changes to future profits and hence consumer welfare. But is this event study technique really useful for competition policy? This article explains why event studies may delight and disappoint in equal measure

The natural starting point for using stock market data in competition policy is to analyse merger announcements, since they are easily identifiable events that typically produce large changes in share prices.[1] For minor corporate events, or even for widely anticipated mergers, it may be difficult to distinguish reaction to the event from general share price volatility. Reaction to a merger announcement should provide information about the market's expectation of the merged firm's ability to exercise market power, or to cut costs through synergies. Of course, a merger may well result in both—more pricing power and greater cost efficiency. The clever part is determining whether, on balance, the merger is bad for consumers—ie, market power effects outweigh efficiency benefits.

Share price analysis may permit this by giving data on the reaction of rival firms to the announcement. Rival firms benefit only if market prices actually increase: they derive no benefit if the merged firm makes internal cost savings and thus becomes a fiercer competitor. Hence their share prices should go up only if, other things being equal, the merger is bad for consumers.[2]

These effects are tested in the economic literature by comparing actual stock price returns of merging firms and their rivals around the merger announcement with a counterfactual of the return without the merger. This is a technique known as an 'event study'. The principle of comparing actual stock price returns with a counterfactual can be used for other purposes. For example, it might be used in a damages case to quantify lost profits against a counterfactual of returns in the absence of the anti-competitive conduct, or in market definition to examine whether two firms which are thought to be in the same market show a similar reaction to entry by a new rival. Event studies are useful beyond the realm of competition. The UK Financial Services Authority uses basically the same approach to test for insider trading around merger announcements.

There are a number of obstacles in the path of a competition authority that wants to treat the stock market as a prediction market. In economic terms, the problem with share price data is 'observational equivalence' between different explanations of why share prices have changed. This means that it is not always possible to isolate the effect of the event in question, and additional information is needed to 'identify' the correct explanation for the change in share prices. In an antitrust context, a further problem is that the stock market's reaction will naturally take account of the expected action of the competition authority (ie, if the market thinks the authority will block a merger, there should be less reaction to a merger announcement). Yet even if the reaction is muted because of an expectation that the merger may get blocked, or because the merger is part of a trend to consolidate, the *direction* of the reaction (up or down) can still be sufficiently informative for the purposes of analysis.

Practical examples of share price analysis

To date there has been limited use of share price data by European competition authorities. An event study analysis of the BICC–Pirelli merger was carried out for the European Commission as part of an ex post review of that merger,[3] and the UK Competition Commission conducted an event study analysis of the water sector as part of its inquiry into the merger of South East Water and Mid Kent Water.[4] The recent publication of a paper on event studies on the Competition Commission's website suggests that authorities are becoming

interested in share prices as a tool of investigation or case prioritisation.[5] An official at the UK Office of Fair Trading (OFT) has also published a paper looking at event study analysis in merger inquiries, examining the BSkyB–ITV inquiry among others.[6] In general, the results of these studies have been mixed, with problems in disentangling the effect of the event in question from other possible explanations; as with a good deal of evidence in competition policy, the results of event studies are not expected to be conclusive in themselves.

In the area of securities litigation in the USA, the event study has been used as a tool for damages calculation in several cases.[7] Weil, Wagner and Frank (2002) describe how US courts have admitted testimony based on event studies, principally in stockholder class action or derivative suits alleging fraud on the market.[8] The broader use of event studies—for example, to calculate damages for breach of contract—has been less successful, since it is difficult for an event study to distinguish a breach of contract from the effects of other corporate events. In Europe, the scope for stock price data in damages estimation is not yet clear. In antitrust, the approach will be clarified as the European Commission's policy develops. In this respect, it is notable that a European Commission Staff Working Paper on damages recognises the utility of:

> a market based valuation approach [that] uses financial multiples to value the injured business, such as stock market value or profits of comparable businesses whose shares are publicly traded on stock exchanges.[9]

Using an event study to analyse a merger

Table 1 summarises the practical steps taken in using an event study to review a merger. This technique can be used to indicate the market's view of the profitability of the proposed merger, and thus potentially to read the market's opinion on the ability of the merged firm to raise prices or save costs.[10] Duso, Gugler and Yurtoglu (2006) report that abnormal share price returns and the ex post profitability of mergers are positively and significantly correlated—and, crucially, that the share price returns can distinguish between anti-competitive and efficiency-enhancing (cost-saving) mergers.[11] This is an important finding, since it suggests that there is a useful relationship between reaction to merger announcements and subsequent anti-competitive effects.

Table 1 How to conduct an event study

Step	Detail
1. Find the event	The day an event (such as a merger announcement) is officially announced is not necessarily the correct date for the purpose of an event study. If information leaks to the stock market in advance, the date that should be used is the day on which substantive information first arrived to the market, which is not easy to identify[1]
2. Find the right firms	It is necessary to identify which firms are likely to be materially affected by the event. This might require casting a wide net, depending on the facts of the case, but with an appreciation that if the scope is too wide there is greater risk of not being able to distinguish genuine reactions from random movements
3. Benchmark returns against the counterfactual return	The abnormal return is the difference between the observed total return[2] over the 'event window' (eg, one day before and one day after the event) and the counterfactual return over that event window. The counterfactual return is normally calculated according to the standard asset pricing model: $R_{i,t} = a_i + b_i R_{m,t} + e_{i,t}$ where $R_{i,t}$ and $R_{m,t}$ are the period t returns on stock i and on the market portfolio, respectively; a_i is the intercept; b_i captures the extent to which the stock's return depends on the market return, and $e_{i,t}$ is the error term for stock i
4. Estimate the counterfactual return	A particular timeframe is used to estimate the model that gives the counterfactual return. In the economic and financial literature it is typical to use an estimation window of 120 days or 200 days
5. Test the statistical significance of the returns	It is important to distinguish genuine effects on share prices from random share price movements, so standard tests of statistical significance are used (eg, the t-test)
6. Interpret the results	Additional information will be needed to reject alternative explanations as to why the share price has moved. For example, a check on whether any other corporate events occurred in the relevant timeframe, and of trading volumes around the time of the event in question. An ex post technique in the case of mergers is to assess whether, if the merger was subsequently blocked, the coefficient relating the returns on merger announcement day and on merger blocking day is –1. This negative relationship is expected because blocking a merger will restore the pre-merger situation

Notes: [1] For mergers, this date can be taken from the Orbis merger database, which records the 'rumour date' of a merger, as well as the announcement date and the completion date. This database may be helpful to competition authorities seeking to identify merger activity.
[2] 'Total return' takes account of dividend payments as well as growth in share prices.

Table 2 Effects of mergers on share prices and hypothesised effect on competition

	Merging firms' share prices increase	Merging firms' share prices decrease
Rivals' share prices increase	Market power increase: reduced competition and lower consumer welfare	Efficiency reduction in merged firm: lower consumer welfare
Rivals' share prices decrease	Efficiency increase in merged firm: higher consumer welfare	Efficiency reduction or increased competition: ambiguous effect on consumer welfare

The standard way to identify anti-competitive mergers is to examine the share prices of rivals to the merging firms. In a merger that softens price competition (eg, because the merged firm raises prices), rivals to the merging firm are likely to benefit and their share prices should typically increase. Thus mergers of this kind are classified as anti-competitive. However, if rivals' share prices fall and those of the merging parties rise, the indication is that the merger is efficiency-enhancing, since the profits of the merged firm increase with cost efficiencies, but rival firms suffer as the merged firm becomes a stronger competitor. Following this approach, an indicative classification of how to interpret various share price movements can be obtained, as shown in Table 2.

A decrease in competitive rivalry is not the only possible explanation of increases in rivals' share prices. For example, a merger announcement may signal that further mergers in the same industry are likely, increasing the probability that rivals to the merging firms will themselves be bid targets in the future. However, Clougherty and Duso (2008) suggest that information effects in the form of future acquisition probability do not drive the positive returns of rivals.[12]

In addition, some mergers could have an exclusionary effect on rivals, but as Clougherty and Duso (2008) show, empirical tests support the contention that horizontal merger events generally result in gains to rival firms, so such exclusionary effects may be relatively rare. Even so, it is advisable to check whether exclusionary effects are likely before seeking to rely on the predictions of Table 2.

Some results from event studies

One popular use of event studies is to compare the 'prediction' of the stock market (as inferred from the event study analysis) with the subsequent decision of the competition authority in a merger. Table 3 shows the results of a study by Kavanagh (2007), which treats the stock market as a predictor of antitrust decisions.[13] In 18 of 27 UK merger cases reviewed, the later antitrust decision is consistent with the direction of the initial stock market reaction (albeit that these reactions are often not statistically significant due to large day-to-day volatility in share prices).[14] Only where the stock market reaction suggests that the merger is anti-competitive is the subsequent antitrust decision not consistent—ie, the event study results seem to significantly over-predict the number of anti-competitive mergers. Perhaps, contrary to Clougherty and Duso (2008), this over-prediction is due to rival firms benefiting from increased expectations of takeover activity. However, little weight can be placed on results that are not statistically significant at standard levels (the key problem is with insignificant reactions from rival firms, not with the reactions among merging firms). For all of the remaining 13 mergers, the direction of the stock market reaction is a consistent predictor of the subsequent antitrust decision. Narrowing down the 27 merger cases to those where the stock market reaction can be said to be statistically significant—which restricts the analysis to cases where share price movements are large—in all four cases the direction of the reaction was consistent with the subsequent antitrust decision. Nevertheless, from such a small sample it is difficult to draw conclusions.

It seems that there is a problem with rival firms' reactions being small to the point of being difficult to reliably distinguish from random variations—this is particularly the case when the merger affects only a part of the business of a rival. Yet rather than rejecting the event study altogether, it is possible to accept that it works properly in a small number of cases only, and to attempt to determine ahead of time which these cases are. For example, a merger between high-street booksellers in the UK may have a very limited effect on the global business of Amazon.com, and as such this would not be a prime case for the event study approach.

Results similar to those of Table 3, showing consistency between the direction of share price changes and subsequent antitrust decisions, are found in a study of Australian mergers (Diepold et al., 2006):

> In the broader group of mergers in the sample that were perceived as being pro-competitive—simply based on sign rather than statistical significance—none were opposed by the ACCC [Australian Competition and Consumer Commission].[15]

This research highlights a possible but limited 'prediction market' role for the event study as an initial screening

Table 3 Predicted effects of mergers, compared with subsequent action by antitrust authority

	Merging firms' share prices increase	Number of mergers where this reaction is observed	Merging firms' share prices decrease	Number of mergers where this reaction is observed
Rivals' share prices increase	Market power increase	14	Efficiency reduction	2
	Expect action by antitrust authority	In only 5 of these 14 cases was the merger not cleared by the OFT or the Competition Commission	Expect no action by antitrust authority. Possible action if industry profits increase	Both mergers were cleared
Rivals' share prices decrease	Efficiency increase	8	Efficiency reduction	3
	Expect no action by antitrust authority	In all 8 cases the merger was cleared	Expect no action by antitrust authority	In all 3 cases the merger was cleared

Note: Abnormal returns are event window –1, +0, unweighted, and adjusted for market expectations of merger clearance. The expectations adjustment was made by dividing observed returns by the probability that the merger would be cleared, where the latter probability was calculated on the basis of market shares in the relevant market. These results should be treated with caution since, statistically speaking, there is no measurable effect on rivals in most cases. This highlights the need to look at each merger individually to reject alternative explanations for the share price movement, or to restrict analysis to cases where close rivals are easily identifiable.
Source: Kavanagh, J. (2007), 'Detecting Anti-competitive Mergers Using Stock Market Data', mimeo.

tool for mergers. If share price data does not indicate a market power increase, the merger may not be anti-competitive; if share price data does indicate a market power increase, further investigation is warranted.

If competition authorities were to screen mergers based on share price reactions, might Goodhart's law—which states that once an indicator is used as a target for policy it becomes useless as an indicator—rob the screening tool of its usefulness? Such a problem seems unlikely, since even if authorities are observing share prices, it may be unrealistic to claim that investors will see a sufficiently clear link between price changes and the probability of merger clearance to justify buying or selling, simply because there are so many other factors relevant to the chances of merger clearance.

What does this mean for competition policy?

Share price analysis is a far-from-perfect tool because the results are often difficult to interpret, but it is an interesting option for competition authorities to consider as part of their 'toolbox'. For a case to be amenable to the event study approach, it is necessary that the relevant companies (including rivals in the case of mergers) are listed on a liquid stock market, that the event can be clearly identified, and also that the antitrust event will have a substantial effect on the value of those firms—otherwise the expected impact on share prices will be small and difficult to distinguish from day-to-day changes on the market.

Outside the realm of mergers, in the area of the debates on the costs and benefits of competition policy, event study analysis could be helpful in quantifying deterrence effects of competition interventions beyond the antitrust fine. Evidence suggests that an antitrust action may, on average, cost a company more than 6% of stock market value, but a fine typically accounts for only around 1–2% of the loss in market value, confirming that the fine is only part of the wider deterrent effect of action against cartels and abuse of dominance.[16]

As noted in the introduction, share prices could also potentially be used for market definition: take two companies that appear to be in the same market and observe whether they exhibit a similar reaction to an external shock, such as the market entry of a new rival. If one reacts but the other does not, this may mean that they are not close rivals after all.[17]

The use of event studies for market definition is as yet largely untested, and its use for damages calculation is not yet established outside securities litigation cases. However, further research and case law will reveal whether this promising, but frequently problematic, technique can be extended to cover broader areas of competition policy, especially as the European Commission develops its guidance on damages estimation.

[1] *Agenda* (2006), 'Blocking the Deal: How Do Merger Decisions Affect Share Prices?', March, available at www.oxera.com.
[2] Rival firms' share prices may benefit, despite reduced costs for the merging firms, if the merger signals consolidation in that industry sector, although see the discussion on this point after Table 2.
[3] Lear (2006), 'Ex-post Review of Merger Control Decisions', study for the European Commission, December, p. 93, para 7.15.
[4] Competition Commission (2007), 'South East Water Limited and Mid Kent Water Limited: A Report on the Completed Water Merger of South East Water Limited and Mid Kent Water Limited', Final Report, p. 65, para. 5.129.
[5] Beverley, L. (2007), 'Stock Market Event Studies and Competition Commission Inquiries', paper published as part of the Competition Commission's 'Topics in Competition Policy' series, August.
[6] Kokkoris, I. (2007), 'A Practical Application of Event Studies in Merger Assessment: Successes and Failures', *European Competition Journal*, **3**:1, June.
[7] For example, In re Executive Telecard, Ltd. Securities Litigation, 94 Civ.7846 (CLB) (S.D.N.Y.1997), and In re Seagate Technology II Securities Litigation, C-89-2498(A)-VRW (N.D. Cal.), in which the court accepted some of the defendants' event studies and dismissed certain claims on that basis. See also *Goldkrantz v. Griffin*, QBS: 02760800 (S.D.N.Y. 1999).
[8] Weil, R., Wagner, M. and Frank, P. (2002), *Litigation Services Handbook: The Role of the Financial Expert*, Third Edition, John Wiley and Sons, p. 19.
[9] Commission of the European Communities (2005), 'Commission Staff Working Paper: Annex to the Green Paper on Damages Actions for Breach of the EC Antitrust Rules', COM(2005) 672 final, December 19th, para 141.
[10] In particular, changes in the value of firms that are close competitors to the merging firms can indicate the likelihood of anti-competitive effects.
[11] Duso, Gugler and Yurtoglu state that 'the market correctly anticipates anti-competitive mergers … Also, the market predicts merging firms' rents stemming from increased efficiencies (procompetitive mergers) more precisely than those stemming from an increase in market power (anticompetitive mergers)' (p. 3). Duso, T., Gugler, K. and Yurtoglu, B. (2006), 'Is the Event Study Methodology Useful for Merger Analysis? A Comparison of Stock Market and Accounting Data', WZB Working Paper, Berlin, September.
[12] Clougherty, J. and Duso, T. (2008), 'The Impact of Horizontal Mergers on Rivals: Gains to Being Left Outside a Merger', WZB Working Paper SP II 2008 – 17, Berlin, May, p. 3.
[13] Kavanagh, J. (2007), 'Detecting Anti-competitive Mergers Using Stock Market Data', mimeo.
[14] '"Normal" levels of share price volatility reduce the ability to attribute movements to the event in question unless they are very significant.' Beverley, L. (2007), op. cit., p. 38.
[15] Diepold, B., Feinberg, R., Round, D. and Tustin, J. (2006), 'Merger Impacts on Investor Expectations: An Event Study for Australia', working paper, October, p. 17.
[16] Langus, G. and Motta, M. (2007), 'The Effect of EU Antitrust Investigations and Fines on a Firm's Valuation', CEPR discussion paper No. 6176, March.
[17] If the two companies do show a similar reaction, this may mean that they are rivals in one market (eg, national grocery retailing) or rivals across more than one market (eg, multiple local grocery markets): it depends on the scope of the entrant's activities.