On concentration screens in horizontal merger review

Volker Nocke, Michael D. Whinston 26 August 2020

Concentration measures such as the post-merger Herfindahl-Hirschman index as well as the merger-induced change in the index are usually key determinants in the review of horizontal mergers by competition agencies and courts. This column studies whether the magnitude of the efficiencies required for a merger not to hurt consumers may be related to the change and the level of the Herfindahl-Hirschman index. On the basis of theoretical analysis substantiated by empirical evidence, it finds that while the critical level of efficiencies depends on the change in the index, it is independent of level of the index. Hence current guidelines should be changed so as to emphasise the change more and the level less.

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In most jurisdictions, concentration measures are key determinants in the review of horizontal mergers by competition agencies and courts. They play a particularly important role at the screening stage at which agencies usually do not have access to data on profit margins and diversion ratios.[2]

The concentration measures typically used are the post-merger Herfindahl-Hirschman Index (HHI) as well as the merger-induced change in the HHI (henceforth, DHHI), both 'naively' computed. The HHI is defined as the sum of the squared market shares; the naïve computation of the post-merger HHI is based on the assumption that the market shares of the non-merging outsiders are not affected by the merger (so that the merged firm's market share is the sum of the merger partners' pre-merger shares) and DHHI is the difference between the (naively-computed) post- and pre-merger levels.

Figure 1 depicts the presumptions outlined in the current US Horizontal Merger Guidelines, issued jointly in 2010 by the Department of Justice and the Federal Trade Commission. The green zone (where HHI is less than 1500 or DHHI less than 100) is a safe harbour region in which mergers "ordinarily require no further analysis"; in the yellow zone, mergers are deemed to "potentially raise significant competitive concerns and often warrant scrutiny", whereas those in the red zone "potentially raise significant competitive concerns and often warrant scrutiny." In practice, this means that mergers in the green zone are almost never scrutinised. It is also interesting to note that, with various revisions of the Guidelines since 1968, the safe harbour region has been substantially enlarged over time.[2]

The US, the EU, and many other jurisdictions have adopted a consumer surplus standard, according to which mergers that hurt consumers should be prohibited. Mergers may be prohibited because of their coordinated effects, i.e. because they are likely to facilitate collusion. However, while coordinated effects used to be front and center in any merger prohibition, they are rarely invoked nowadays. Instead, most merger analyses focus on the merger's unilateral effects – essentially, the merger's impact on the static Nash equilibrium.

Given the emphasis on the merger's unilateral effects, what is the rationale for using the level and merger-induced change in the HHI in screening mergers?

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Figure 1 Screening thresholds in the 2010 U.S. Horizontal Merger Guidelines
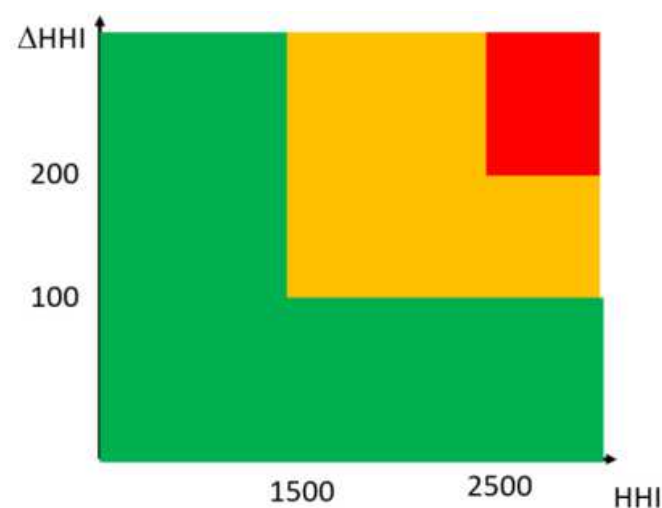
One reason could be that the merger's likely harm is related to those concentration measures. In a multiproduct-firm oligopoly model with (nested) multinomial logit or CES demands, Nocke and Schutz (2019) show that, absent merger-induced efficiencies, the merger's unilateral effect on consumer surplus is approximately proportional to DHHI and independent of HHI, where the approximation is taken either around small market shares or around monopolistic competition 'conduct'.

However, as Farrell and Shapiro (1990) have shown for mergers in homogeneous-goods Cournot markets and Nocke and Schutz (2019) for mergers in differentiated-goods markets with multinomial logit or CES markets, any merger harms consumers unless it induces (sufficiently large) synergies.

It is therefore natural to ask whether the magnitude of the efficiencies required for the merger not to hurt consumers can be related to the change and the level of the HHI. This is the avenue we pursue, both theoretically and empirically, in a recent paper (Nocke and Whinston, 2020).

In the theoretical part of our analysis, we consider three canonical models of competition – the homogeneous-goods Cournot model and the differentiated-goods Bertrand models with logit and CES demands – in which one might hope to get a clear relationship between the required efficiencies and measures of concentration. For mergers not to harm consumers, we find that the critical level of efficiencies depends on the market shares of the merger partners: An increase in each merger partner's pre-merger market share (resulting in an increase in DHHI) or a sum-preserving change of the merger partners' market shares toward symmetry (also resulting in an increase in DHHI) is indeed associated with a higher critical level. However, for given levels of industry and product-level elasticities, that critical level is independent of the HHI once conditioning on the merging firms' market shares. We also investigate how the level of the required efficiencies is related to the merging firms' market shares. At common levels of demand elasticities, we find that the merger-induced synergies have to be quite substantial, even for mergers that would fall in the safe harbor zone.

In the empirical section of Nocke and Whinston (2020), we study mergers in the US beer industry, using the estimated random-coefficient nested logit demand system in Miller and Weinberg (2017). Treating each local market separately, we compute for various hypothetical local mergers the percentage-change improvement in marginal cost that would be required to prevent consumer harm. As illustrated in Figure 2, the results show that the critical efficiency level is strongly related to DHHI and almost independent of HHI (when conditioning on DHHI). The levels of the merger-induced DHHI necessary to prevent consumer harm in these markets generally fall in the range of those derived in the theoretical part of the analysis. The levels required indicate that if the typical merger in these markets results in a 3% efficiency gain, then many of these hypothetical mergers falling into the current safe harbor, and in particular those with post-merger HHI below 1500, would be likely to harm consumers.

Figure 2 Relationship between the synergy required for a merger not to harm consumers and the naively computed post-merger HHI and its naively computed change

Note: green crosses < 5%, brown squares 5-10%, blue circles 10-15%; red diamonds >15%.

All in all, these results suggest that the current guidelines be changed in form, by emphasising DHHI more and HHI less, and also in level, by making the thresholds -- particularly for the safe harbour -- more stringent.

References

Farrell, J and C Shapiro (1990), "Horizontal Mergers: An Equilibrium Analysis", *American Economic Review* 80(1): 107-126.

Miller, N H and M C Weinberg (2017), "Understanding the Price Effects of the MillerCoors Joint Venture", *Econometrica* 85(6): 1763-1791.

Nocke, V and N Schutz (2019), "An Aggregative Games Approach to Merger Analysis in Multiproduct-Firm Oligopoly", CEPR Discussion Paper 12905.

Nocke, V and M D Whinston (2020), "Concentration Screens for Horizontal Mergers", CEPR Discussion Paper 14979 and NBER Working Paper 27533.

Endnotes

[1] Calculating market shares requires defining the relevant market.

[2] The 2004 European Commision Horizontal Merger Guidelines also state that mergers with an HHI below 1000 "normally do not require extensive analysis" and that mergers with an HHI between 1000 and 2000 and a DHHI below 250 or those with an HHI above 2000 and a DHHI below 150 are "unlikely" to raise "horizontal competition concerns" (except where "special circumstances" are present).

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