John Kwoka's *Mergers, Merger Control, and Remedies*: A Critical Review

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Abstract

John Kwoka's recently published *Mergers, Merger Control, and Remedies* (2015) has received considerable attention from both antitrust practitioners and academics. The book features a meta-analysis of retrospective studies of consummated mergers, joint ventures, and other horizontal arrangements. Based on summary statistics derived from these studies, Kwoka concludes that domestic antitrust agencies are excessively tolerant in their merger enforcement; that merger remedies are ineffective at mitigating market power; and that merger enforcement has become increasingly lax over time. We review both his evidence and his empirical methods, and conclude that serious deficiencies in both undermine the basis for these conclusions.

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I. Introduction

John Kwoka's recently published *Mergers, Merger Control, and Remedies* (2015) has received considerable attention from both antitrust practitioners and academics.[1] The book's centerpiece is a meta-analysis of retrospective studies of consummated mergers, joint ventures, and other horizontal arrangements.[2] Kwoka creates a database of the estimated price effects reported in these academic studies, and uses it to address important questions about federal antitrust enforcement, such as: Do the agencies successfully identify anticompetitive mergers? Do merger remedies effectively prevent the creation and exercise of market power? Have the agencies applied consistent standards over time for identifying and challenging anticompetitive mergers?

Based on summary statistics generated from his database, Kwoka concludes that domestic antitrust agencies are excessively tolerant in their merger enforcement; that merger remedies are ineffective at mitigating market power; and that merger enforcement has become increasingly lax over time.

As FTC economists, we appreciate Kwoka's effort to distill for a broader audience the wide range of published analyses of antitrust enforcement actions. The FTC has a long-standing culture of reflection and self-assessment; indeed, current or former FTC Bureau of Economics (BE) staff authored many of the studies in Kwoka's survey.[3] Currently, the FTC is conducting its second major assessment of its merger remedies;[4] the first was released in 1999.[5] Retrospective studies of consummated mergers have increased the FTC's antitrust knowledge base, and have helped it improve enforcement accuracy by providing valuable insights into when merger policy has worked, and when it has not.

For example, after a series of unsuccessful hospital merger challenges, FTC Chairman Muris launched the Hospital Merger Retrospective Project in 2002, which contributed to the FTC's recent successes in challenging harmful hospital mergers.[6] More generally, as Ashenfelter et al.

[1] See, e.g., Skitol (2015).

[2] "Meta analysis" is a method for systematically combining quantitative findings from multiple studies to develop a finding that has greater statistical power than any of the individual studies alone.

[3] In addition to studying mergers retrospectively, FTC staff also have studied retrospectively the effects of nonmerger activity. *See* Lafferty et al., (1984).

[4] See *Federal Register*, Vol. 80, No. 11, January 16, 2015, for a discussion of the current study. For a summary on the FTC web site, see https://www.ftc.gov/policy/studies/remedy-study.

[5] See "A Study of the Commission's Divestiture Process," 1999, https://www.ftc.gov/sites/default/files/attachments/merger-review/divestiture.pdf.

[6] See Haas-Wilson & Vita (2011) and Ashenfelter et al. (2011). Since the completion of this project, the FTC has enjoyed a string of successes (either successful litigation, or transactions abandoned after the issuance of an FTC complaint; *see Inova, Promedica, Carilion, Rockford, Reading, Pinnacle,* and *Advocate*). In the recently decided *Advocate* merger challenge (*FTC v. Advocate Health Care Network* et al., No. 16-2492 (7th Cir.)), the appellate court

(2009) have noted, prior to the publication of merger retrospectives in the academic literature, there was virtually *no* empirical evidence on the actual competitive effects of horizontal mergers.[7] Retrospective analyses also help the agencies assess and improve the empirical tools used for prospective merger enforcement.[8] We therefore regard retrospective analyses of policy decisions as a vital input into the refinement and improvement of antitrust merger policy.

While acknowledging many of these valuable contributions of retrospective analysis to merger policy, Kwoka's principal focus is to use this literature to draw conclusions about contemporary federal merger policy. These include:

- **"**We can conclude that recent merger control has not been sufficiently aggressive in challenging mergers." (p. 158);

- "The evidence also indicates that many challenged mergers are subject to remedies that fail to prevent post-merger price increases. Neither conduct nor structural remedies on average succeed in that objective, but of the two types of remedies, the conduct approach has shown itself to be particularly ineffective." (pp. 159-60).

- "It can therefore reasonably be concluded that . . . the numerical shift toward a more accommodating policy across these decades reflects a bona fide policy change." (p. 117).

Are these conclusions justified? In what follows, we provide a detailed examination of Kwoka's conclusions, and the studies and methods on which they rely. For a variety of reasons, we find the evidence he presents cannot support such broad conclusions. For example, as we will show, several of the studies that form the basis for his criticisms of negotiated remedies actually provide little information about the effectiveness of those remedies. When those studies are removed from his analysis, the remaining evidence is weak and equivocal.

In addition, there are substantial methodological issues with his analysis. Kwoka does not appear to employ standard meta-analytic techniques for computing the average price effects and their associated standard errors of the studies in his sample. For example, he does not weight his observations by their estimated variances. The absence of weighting means that imprecise estimates of price effects receive the same weight as precisely estimated effects in the computation of his averages, which is a substantial departure from standard meta-analytic methodology. More importantly, he reports no standard errors for his estimated average price effects, which means that neither he nor his readers can conduct the hypothesis tests (e.g., is

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cited published FTC hospital merger retrospectives, specifically Tenn (2011), Thompson (2011) and Vita & Sacher (2001).

[7] See Ashenfelter et al. (2009), p. 72.

[8] See Peters (2006); Weinberg & Hosken (2013); and Garmon (2015).

the average merger price effect statistically different from zero?) normally present in this type of inquiry. The absence of standard errors is not only a substantial departure from basic meta-analytic methods, but is also a substantial departure from normal econometric practice. Last, we show that Kwoka's analysis provides little support for the conclusion that enforcement standards have become weaker over time.

In what follows, we explore and discuss these issues in greater detail.

I. Kwoka's Analysis of Federal Merger Policy and Merger Remedies

The core of the Kwoka study, at least as it concerns FTC and DOJ enforcement policy, is contained in chapter 7, "Merger Policy and Remedies." Kwoka canvases the economic literature for relevant research, identifying 49 transactions for which a retrospective study exists. Of these 49 transactions, 42 are mergers; the others are either joint ventures or airline "code shares." Kwoka provides a brief synopsis of each transaction and the relevant study (or studies) in Appendix I of his book. The appendix to this paper reproduces Kwoka's Table 6.2 (pp. 90-91), which lists all 49 transactions in his database.

After compiling a database of these estimated price effects from the literature, Kwoka computes average price changes based on various mutually exclusive categories of agency actions. Table 1 lists Kwoka's results, where the first column contains average price effects reported in Kwoka's Table 7.9 (p. 120), while the second column reports the number of mergers in each category from Kwoka's Table 7.4 (p. 115). Kwoka interprets these average price effects as follows:

- Kwoka interprets the 1.86% increase for "opposed mergers" – that is mergers where either the FTC or DOJ recommended blocking the transaction in its entirety – as evidence that the "agencies' actions were effective" (p. 120).

- He interprets the 7.05% and 16.03% increases for mergers with divestiture and conduct remedies, respectively, as follows: "Thus, while neither type of remedy for competitively problematic transactions seems to have been especially effective in restraining post-merger price increases, conduct remedies were by far the weaker of the two." (p. 120) He also states, "it is clear that agency actions did not preserve or restore the price competition otherwise lost as a result of these mergers." (p. 119)

- Regarding the 6.08% and 7.15% price increases for cleared mergers, Kwoka states, "these studied mergers appear to be cleared too often." (p. 120). Elsewhere, he states that the agencies "fail to challenge a considerable fraction of [mergers] that result in price increases." (p. 126)

Table 1: Kwoka average price effects by agency enforcement action[9]

Agency Action	Average Price Effect (Kwoka Table 7.9)	Number of mergers (Kwoka Table 7.4)
All mergers in the sample	7.22%	42
All mergers opposed by agencies	1.86%	5
Mergers when a divestiture remedy was obtained	7.05%	6
Mergers when a conduct remedy or conditions imposed	16.03%	4
Mergers explicitly cleared by agencies	6.08%	5
Mergers presumably cleared due to lack of explicit information	7.15%	22

Kwoka finds that FTC/DOJ policy has failed systematically to achieve its stated objective of preserving competition (p. 119):

> "The mean price change for all the mergers where the antitrust agency took any enforcement action – that is, opposition or any challenge and remedy – was an increase of 7.71 percent.[10] This result is inconsistent with the proposition that agency actions served to preserve or restore competition. **Rather, it implies that policy decisions and actions have been too accommodating, failing in their mission of preventing post-merger price increases**." [emphasis added]

Kwoka concludes (pp. 120-121):

> "These results suggest that merger policy at the margin has been excessively permissive . . . remedies do not appear adequate to the task of preventing post-merger price increases . . . All in all, both investigations and policy actions appear to err on the side of permissiveness, with result that too few mergers are challenged, and too few of those that are challenged are subject to either adequate remedies or opposition by the antitrust agencies."

[9] There is a slight discrepancy between the count of mergers with divestitures listed in Kwoka's Table 7.4 (i.e., 6) and the count that one obtains from Appendix I (i.e., 7). Apparently (see Kwoka note 6, chapter 7) Kwoka assigned a "half-frequency" score to *Xidex* and *Thomson* because the remedies in those cases involved both divestitures and licensing.

[10] 7.71 percent is the average price change for the 15 transactions listed in rows 2 through 4 of Table 1 (i.e., those underlying the 1.86%, 7.05%, and 16.03%), taking account of the different number of transactions in each row.

He also finds (p. 126):

> "[T]here is strong evidence that these mergers on average have resulted in higher prices, and strikingly, that is the case regardless of whether the agencies acted or not, and if they did, what type of action they took. This pervasive anticompetitive outcome from these well-studied mergers is indicative of the need for closer policy scrutiny of mergers at the enforcement margin and for stronger actions and remedies in the case of challenged mergers."

II. Evaluation of Kwoka's Evidence

Kwoka's central conclusion is that federal – that is, FTC and DOJ – merger enforcement is excessively lenient and ineffective. Too many anticompetitive transactions proceed unchallenged. When mergers are challenged and addressed via remedies negotiated with the merging parties, these remedies, either divestiture or conduct remedies, are inadequate to prevent the creation and exercise of market power. Further, he concludes that federal merger enforcement has grown increasingly lenient over time.

Do the underlying publications support these conclusions? In what follows, we examine more closely the relevant merger studies from his data sample.

A. Composition of Kwoka's sample: initial observations

Given that a principal objective of Kwoka's analysis is to assess the effectiveness of *recent* antitrust enforcement policies, one is struck by the age of some transactions in his sample. Three mergers (*Scott Graphics/Xidex*, *Kalvar/Xidex*, and *Weyerhaeuser/Menasha*) pre-date the issuance of the modern *Merger Guidelines* in 1982. One of them (*Kalvar/Xidex*) pre-dates enactment of the HSR Act in 1976. Transactions of this vintage do not inform the evaluation of contemporary FTC enforcement policy. In fact, only seven of the mergers in his sample occurred in 2000 or later, with the most recent in 2006. While the set of transactions available for inclusion in his meta-analysis is beyond Kwoka's control, the paucity of recent transactions nevertheless constrains inference about <u>current</u> FTC and DOJ policy.[11]

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[11] In contrast, in comments to the FTC about its current merger remedies study, Prof. Kwoka expressed concern that the findings of the previous (1999) FTC Remedies Study had grown stale, notwithstanding that the transactions in that study were more recent than many of those in his data sample. Specifically, Prof. Kwoka wrote, "[T]he nature of mergers has arguably changed in recent years, so that a study reliant on twenty-year-old experiences may not capture the policy choices that are most relevant in the matters before the FTC today" and that "over the past decade remedies themselves have shifted in their emphasis." See https://www.ftc.gov/policy/public-comments/2015/03/17/comment-00006.

The data sample also is unrepresentative of the population of industries where mergers now occur. The studies in Kwoka's sample are concentrated in a handful of industries. Thirty of the 49 transactions (and 23 of the 42 mergers) occur in three industries: petroleum (11), airlines (9),[12] and academic/professional journal publications (10).[13] Also, because some of the studies included in Kwoka's sample examine numerous transactions, there is a lack of diversification in primary research sources. One publication analyzes eight petroleum mergers,[14] and one author (in two publications) addresses ten journal publication mergers.[15] More than 40 percent of the mergers in Kwoka's data sample come from these two sources.

This lack of diversification in sources and industries increases the likelihood that idiosyncratic issues will affect the results of his meta-analysis. For example, consider the transportation sector. In the early stages of airline deregulation, prior to 1989, the Department of Transportation (DOT) retained authority over airline mergers.[16] DOJ's role was merely advisory. All five of the airline mergers in Kwoka's sample occurred prior to this transfer of jurisdiction. In addition, Kwoka's analysis includes two railroad mergers, which to this day fall under the Surface Transportation Board's ("STB") jurisdiction. These seven transactions, representing 14 percent of Kwoka's sample, cannot inform an analysis of the effectiveness of current FTC and DOJ merger policy.

The concentration of Kwoka's sample in a small number of industries renders it remarkably unrepresentative of current HSR filings. The three industry groups discussed above (transportation, energy, and journal publishing) represent 32 of his 49 transactions, i.e., two-thirds of his sample. In contrast, transportation and energy represent only 8.4 percent of FY2015 HSR filings, with journals not listed separately (presumably they are contained within the "other" category).[17] Similarly, consumer goods and manufacturing represent 43 percent of HSR filings, versus 16 percent in the Kwoka sample.

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[12] Kwoka's count of cases by industry in his Table 6.3 is incorrect; there are 11 petroleum transactions, 9 (not 10) airline transactions, and 5 (not 4) hospital mergers.

[13] Ashenfelter et al. (2014, S77) make this same observation in their survey of the retrospective literature: "Unfortunately, the mergers studied do not constitute a representative sample of all potentially anticompetitive mergers . . . most merger studies examine mergers in one of four industries that have experienced a large number of mergers and where data are available: airlines, banking, hospitals, and petroleum."

[14] Karikari et al (2007) analyzes *BP/Amoco*, *Exxon/Mobil*, *MAP/UDS*, *Marathon/Ashland*, *Shell/Texaco*, *Shell/Star*, *Tosco/Unocal*, and *UDS/Total*. We will have more to say about the Karikari et al. study below.

[15] McCabe (2002, 2004) analyzes *Wolters Kluwer/Lippincott*, *Reed Elsevier/Pergamon*, *Wolters Kluwer/Thompson*, *Harcourt/Churchill*, *Thompson/Shepards*, *Wolters Kluwer/CCH*, *Reed Elsevier/West*, *Thompson/West*, *Wolters Kluwer/Little/Brown*, and *Reed Elsevier/Matthew Bender*.

[16] When Congress eliminated the Civil Aeronautics Board (CAB) in 1985, it temporarily transferred merger review authority to the Department of Transportation. The DOT's jurisdiction over mergers terminated effective December 31, 1988, after which time DOJ assumed sole responsibility for airline merger review.

[17] See *FTC/DOJ Hart-Scott-Rodino Annual Report FY 2015,* available at https://www.ftc.gov/system/files/documents/reports/federal-trade-commission-bureau-competition-department-justice-antitrust-division-hart-scott-rodino/160801hsrreport.pdf.

Kwoka's sample includes six mergers that were not reviewed by the agencies until after they had been consummated.[18] Under the 1976 HSR Act, only mergers exceeding certain size thresholds require pre-merger filing with the antitrust agencies. One merger in Kwoka's sample predated HSR, while the remainder fell below the HSR filing threshold and thus were consummated prior to agency review.

This is an important factor to take into account in any assessment of enforcement remedies. The remedies available to the agencies once a transaction has been consummated are very different from those available pre-consummation. Indeed, the HSR Act was enacted precisely because of the extreme difficulty in obtaining effective relief once a transaction has been consummated and the "eggs scrambled";[19] as we discuss in detail below, it is misleading to compare the effects of remedies obtained under these very different conditions.

As the discussion above highlights, Kwoka's data sample does not represent the population of agency-reviewed mergers. This limits one's ability to draw general conclusions about the effectiveness of overall merger policy. The remainder of this section examines more closely the particular elements of the data sample used to support some of Kwoka's most targeted conclusions, focusing on his conclusions about merger remedies, both structural and conduct.

B. Structural divestiture remedies in merger cases

Kwoka concludes (see Kwoka Table 7.9, reproduced in Table 1 above) that even when the agencies obtained asset divestitures, prices on average nonetheless increased by 7.05 percent. From this, he infers that asset divestitures in general were inadequate to constrain the exercise of market power.

As Kwoka reports in his Table 7.4 (see Table 1 above), this average price effect is derived from seven transactions. These are:

- *Kalvar/ Xidex (1979)*: This consummated merger was challenged by the FTC in 1981. The FTC order, requiring the licensing of technology[20] and the divestiture of productive assets, became final in July 1983. However, the Barton & Sherman paper on which Kwoka relies analyzes the effects of two Xidex mergers using data spanning the period 1973-82 – a sample period that ends one year *before* the remedy was imposed.[21] Barton & Sherman had no data from the post-remedy period.

[18] These are: *Scott Graphics/Xidex*; *Kalvar/Xidex*; *Dominican/AMI*; *New Hanover/Cape Fear*; *Evanston/Highland Park*; *Provena St. Therese/Victory*.
[19] See Elzinga (1969).
[20] The non-divestiture portion of this remedy will be discussed further in the next section of this report.
[21] See Barton & Sherman (1984, p. 168).

Accordingly, this study cannot (and does not) say anything about the effectiveness of the FTC's relief in those two cases because its analysis is post-merger, but pre-remedy. Accordingly, we conclude that this study provides no evidence on the effectiveness of FTC divestiture remedies, and therefore cannot support Kwoka's conclusion that merger remedies have been ineffective. Note that omitting the Barton & Sherman study substantially reduces Kwoka's estimated average price effect in mergers with divestitures – reducing it from 7.05% to 4.43% – as the estimated price increase for the *Xidex/Kalvar* merger was large (22.8%).[22]

- *Thomson/West* (1995): McCabe (2004) analyzes the price effects of several journal publishing mergers within a single framework. The DOJ required divestiture of Thompson's legal publication unit to Reed Elsevier in January 1997. The author finds that prices rose significantly, ranging from 11% to 40%, following the divestiture. We agree this study raises questions about whether this particular remedy was effective.

- *Guinness/Grand Met* (1997): This merger combined two producers of distilled spirits. The FTC required the divestiture of Bombay and Bombay Sapphire gin, and Dewar's Scotch, to Bacardi. Ashenfelter & Hosken (2010) estimate the price effects of the transaction for Scotch, gin, and vodka, finding positive price effects in Scotch, but ambiguous results for gin & vodka – some specifications yield a positive merger price effect, others a negative effect. In the case of gin and vodka, this ambiguity arises from the choice of a control group; positive price effects are obtained using a control group of private label producers, and negative price effects when using a control group of branded producers.[23] For the merger viewed in its entirety, A&H find a net positive price effect of 2.7 percent when private label control groups are used, but a negative 1 percent price effect when branded control groups are used.[24] In other words, the underlying academic study provides mixed evidence regarding the remedy effect, in contrast to Kwoka's definitive conclusions that remedies have been ineffective. Depending upon how these numerous heterogeneous price effects were averaged together – a topic we shall further address below – the degree to which this study supports Kwoka's conclusion about the ineffectiveness of divestiture relief is unknown.

[22] See Barton & Sherman, (1984, p. 170).

[23] If the control group consisted of private label producers, the estimated price effect tended to be positive. With branded control groups, the estimated effect tended to be negative (A&H, 2010, p. 451). In their Table 3 (A&H, 2010, p. 441), A&H report overall price effects for this merger by computing revenue-share-weighted averages of the individual price effects. A&H report estimated price effects for 28 individual products (a product is a brand/size combination; e.g., Johnny Walker Black 750 ml), using both types of control groups. Of these 56 reported price changes, 25 were negative.

[24] Only the analysis of price effects for Scotch and gin would be relevant to assessing the effectiveness of the FTC divestiture remedy (because the FTC did not require a divestiture for vodka). It remains unclear how Kwoka combined gin and Scotch into an average post-remedy price effect for the purposes of assessing the FTC's remedy.

- *BP/Amoco* (1998) and *Exxon/Mobil* (2000): Kwoka cites a study conducted by the GAO (2004), ultimately published as Karikari (2007), for the price effects of these two mergers, both of which required divestitures of various petroleum assets. Given the importance of petroleum market merger enforcement to the FTC, BE staff expended considerable effort examining this study,[25] ultimately expressing substantial concerns about its empirical methods and the robustness of its results.[26] BE staff re-estimated the mergers' price effects using a more accepted empirical design, obtaining results inconsistent with GAO's original findings.[27] For example, the FTC estimated the price effect of the Exxon/Mobil transaction to be about 0.11¢/gallon for branded gasoline (about one-tenth of GAO's estimate of 1.34¢/gallon); and between -0.34¢ and -0.26¢/gallon for unbranded gasoline (compared to GAO's estimate of 0.77¢/gallon).[28] For BP/Amoco, the FTC's estimates also were smaller than GAO's by approximately 15-40 percent. Kwoka did not include these very different findings in his meta-analysis. Had they been included, the average price increases reported in his Table 7.9 (Table 1, above) would have been reduced, weakening the basis for his critique of federal merger enforcement policies.

[25] Prior to the study's public release, the FTC provided the GAO with a detailed critique of its methods and conclusions. See https://www.ftc.gov/sites/default/files/attachments/press-releases/statement-federal-trade-commission-chairman-timothy-j.muris-gao-study-1990s-oil-mergers-concentration-released-today/040527petrolactionsftcresponse.pdf. Post-release, in 2005, the FTC held a public conference on Oil Industry Merger Effects, in which independent experts (Dennis Carlton, Jerry Hausman, Hal White, Ken Hendricks, and Scott Thompson) were invited to discuss the merits of the GAO study and an FTC study. See https://www.ftc.gov/news-events/press-releases/2005/01/ftc-host-conference-oil-industry-merger-effects. Additionally, the FTC's Bureau of Economics (BE) staff prepared a detailed technical report on the GAO study (FTC BE Staff Technical Report (2004)).

[26] Among a number of statistical/methodological problems, the initial GAO study ("GAO I", ultimately published as Karikari et al. 2007) did not estimate the mergers' price effects using the "difference-in-difference" empirical method. As Kwoka emphasizes (2015, p. 84), use of this method is essential if one is to correctly measure the competitive effect of a merger (also see Kwoka (2015), ch. 4, for a description of this method). This methodological deficiency notwithstanding, Kwoka included this study in his database.

[27] When the FTC staff re-estimated the GAO equation using a difference-in-difference specification, GAO's findings of positive merger price effects were substantially attenuated, and in some cases reversed (i.e., negative price effects were found). The BE Staff Technical Report found that the GAO I results were not robust to a number of perturbations to GAO's specification. In response to another Congressional request (and after receiving the FTC staff's critique of their first study), GAO conducted a second set of merger studies in 2009, "GAO II." GAO II was published as Kendix & Walls (2010). GAO II used a revised identification strategy that was a correct difference-in-difference specification (i.e., it addressed the concerns articulated by the FTC about the methodology of GAO I). GAO II studied 7 oil mergers and found 4 instances there were not significant price effects; mixed results in the other 3 (e.g., price increases in some specifications but not in others); and some significant price decreases. Overall, GAO II found far fewer adverse competitive outcomes than did GAO I. GAO II was carried out as part of a formal audit of the FTC's antitrust enforcement in oil markets. The audit concluded that the FTC should continue to conduct oil merger retrospective analyses to help guide its enforcement actions. Since then, BE has conducted several additional oil merger retrospectives and has found little evidence of anticompetitive effects. See Hosken et al. (2011); Silvia & Taylor (2013); and Kreisle (2015).

[28] See FTC Staff Technical Report, (2004, p. 38).

- *Fleet/BankBoston* (1999): Calomiris & Pornrojnangkool (2005) analyze this merger in a working paper, the only unpublished study in Kwoka's sample. In September 1999, the DOJ and the Federal Reserve cleared the merger subject to divestiture of 306 branches. The authors estimate the effects of this merger on the cost of loans to borrowers of different sizes, both inside and outside of New England. For large and small borrowers, they find negative price effects from the merger; for medium-sized borrowers, they find that the merger increased the price of loans. As with Ashenfelter & Hosken (2010), these mixed results do not support a clear conclusion that this was an ineffective remedy.

- *Johnson & Johnson/Pfizer* (2006): Tenn & Yun (2011) analyze the impact on six product lines divested to resolve the FTC's competitive concerns from this merger. Kwoka acknowledges that the *J&J/Pfizer* remedy was effective: "[Tenn & Yun] conclude that the post-divestiture performance of the divested brands was similar to their pre-divestiture performance and the divestitures served to maintain the pre-transaction level of competition." (p. 216)

In summary, of the seven studied transactions underlying Kwoka's conclusion that FTC/DOJ divestiture remedies have been ineffective, one study (*Xidex/Kalvar*) does not measure the effect of the remedy; four studies (*Exxon/Mobil*, *BP/Amoco*, *Guinness/Grand Met* and *Fleet/BankBoston*) obtained mixed results; one study determined the remedy (*J&J/Pfizer*) to be an unequivocal success; and only one study (*Thomson/West*) appears to present clear evidence of a failure to constrain market power.

We are unpersuaded that these academic studies support Kwoka's conclusion that the U.S. antitrust agencies' merger remedies have been inadequate in preventing the advancement of market power, or "that many challenged mergers are subject to remedies that fail to prevent post-merger price increases." (Kwoka, 2015, p. 159)

C. Non-divestiture remedies in merger cases

Kwoka also criticizes the use of conduct remedies by the federal antitrust agencies in merger investigations.[29] The term "conduct remedy" refers to a transaction allowed to proceed but which imposes some restriction on the merged entity's post-merger conduct in an attempt to constrain the exercise of market power. In contrast to a structural remedy, a conduct remedy does not require physical separation or divestiture of assets.

As reported in Table 1 earlier, Kwoka Table 7.4 lists four mergers in his sample cleared with a conduct remedy or other conditions, and according to Kwoka Table 7.9, these transactions exhibit an average price increase of 16.03 percent. Kwoka (p. 120) concludes that "while [neither divestitures nor conduct remedies] seems to have been especially effective in restraining post-merger price increases, conduct remedies were by far the weaker of the two."

Before proceeding with an analysis of the cases that underlie this conclusion (pausing to note that four is a small sample size on which to base broad policy conclusions), it is important to clarify the role conduct remedies play in federal merger enforcement. Readers unfamiliar with federal antitrust policy as normally practiced by the DOJ and the FTC might infer from Kwoka's discussion that the agencies frequently attempt to remedy horizontal mergers with conduct remedies, and that the frequency of such remedies may have increased over time.

Such an inference would be mistaken. As both the DOJ and the FTC emphasize, structural (i.e., divestiture) remedies are strongly preferred in horizontal merger enforcement. The FTC makes this clear in its 2012 formal statement of advice to merging entities:[30]

> "Most merger cases involve horizontal mergers, and the Commission prefers structural relief in the form of a divestiture to remedy the anticompetitive effects of an unlawful horizontal merger. Non-structural, or conduct, relief may also be required in aid of a required divestiture to remedy those effects. Such additional relief may include supply agreements, employee obligations, confidentiality protections, and other provisions necessary to support a successful divestiture."

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[29] Kwoka (2015, p. 156): "Conduct remedies are more difficult to design and implement than divestitures, thus leading to their demonstrated ineffectiveness. They have nonetheless become more frequently used by the U.S. antitrust agencies."

[30] "Negotiating Merger Remedies," Statement of the Bureau of Competition of the Federal Trade Commission January 2012, available at https://www.ftc.gov/tips-advice/competition-guidance/merger-remedies. Similarly, the DOJ has stated (see "Antitrust Division Policy Guide to Merger Remedies," June 2011, available at htpps://www.justice.gov/atr/public/272350.pdf*:* "In the case of horizontal mergers, enhanced market power is the result of combining similar sets of assets that otherwise would be used to compete. Consequently, if a competitive problem exists with a horizontal merger, the typical remedy is to prevent common control over some or all of the assets, thereby effectively preserving competition. Thus, the Division will pursue a divestiture remedy in the vast majority of cases involving horizontal mergers. Divestiture of overlapping assets, usually an existing business entity, can effectively preserve competition that the merger otherwise would eliminate."

Conduct remedies are not a standard remedy for ordinary horizontal merger cases. Rather, as noted above, conduct remedies serve a complement to divestiture remedies to ensure the success of the latter.[31] Occasionally, conduct remedies are employed in vertical merger cases,[32] which are not part of Kwoka's study. Conduct remedies are also used in other exceptional cases, such as consummated mergers. They rarely arise as the principal remedy in traditional horizontal merger investigations, especially HSR-reportable transactions where the FTC and the DOJ can initiate enforcement actions prior to consummation.[33] Kwoka's discussion suggests erroneously that the agencies routinely (and increasingly) employ conduct remedies as a principal mechanism to mitigate market power in horizontal merger enforcement.[34]

With this perspective, let us review the four transactions Kwoka identifies as conduct remedies underlying his reported average price increase of 16.03 percent:

- *Scott Graphics/Xidex (1976)*: This was one of the two consummated mergers studied by Barton & Sherman (1984). Earlier we discussed the *Kalvar/Xidex* case, noting that Barton & Sherman (1984) studied pricing behavior post-merger, but pre-remedy. The identical observation applies for *Scott Graphics/Xidex*, as Barton & Sherman's data spans 1973 to 1982; however, the order requiring licensing of Scott Graphics' technology did not become final until 1983.[35] *This study provides no information regarding the effectiveness of the FTC's remedy because the remedy was outside the data window.* This remedy may well have been highly effective, completely ineffective, or something in between.

- *Dominican/AMI (1990)*: Kwoka also includes the Dominican/AMI hospital merger in his sample, studied by Vita & Sacher (2001). This also was a non-HSR reportable transaction, consummated in 1990 prior to the FTC's investigation. After consummation, the acquired hospital had been converted to a skilled nursing facility. Accordingly, restoring the pre-merger state of competition was never an option, as the FTC explained at the time.[36] For this reason, the *Dominican/AMI* merger provides an invalid basis for assessing agency policy for HSR-reviewable transactions.

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[31] See Feinstein (2013, pp. 16-17).
[32] See, e.g., In the Matter of The Coca-Cola Company; Analysis of Agreement Containing Consent Order to Aid Public Comment, Federal Register, Vol. 75, No. 191, Monday, October 4, 2010.
[33] However, see, e.g., Feinstein (2013, p. 15) for a discussion of a recent case (Honeywell) where the facts warranted the use of a licensing remedy.
[34] Kwoka states that the agencies have increasingly employed conduct remedies (Kwoka, p. 134). The three cases he cites in support – *Ticketmaster/LiveNation; Comcast/NBCU;* and *Google/ITA* – involved the creation of market power primarily from *vertical*, rather than horizontal, consolidation. See the Competitive Impact Statements for each of these transactions, found at https://www.justice.gov/atr/case-document/competitive-impact-statement-209; https://www.justice.gov/atr/case-document/competitive-impact-statement-72; and https://www.justice.gov/atr/case-document/competitive-impact-statement-115.
[35] The FTC required the royalty-free licensing of Scott Graphics' diazo microfilm technology. Barton & Sherman (1984, p. 176).
[36] See Statement of Chairman Janet D. Steiger in Support of Final Issuance of Consent Order In the Matter of Dominican Santa Cruz Hospital, et al. 118 F.T.C. 382 (1994). "The facts of this case provide sufficient reason to

- *General Mills/Ralcorp (1997)*: In this HSR transaction, the FTC's remedy permitted Ralcorp to produce private label competitors to the branded Chex cereals that it sold to General Mills. We agree that this transaction constitutes a valid test of the effectiveness of a straightforward conduct remedy in an HSR merger case, and it is clear from the results in Ashenfelter & Hosken (2010) that this remedy was not effective.

- *Evanston/Highland Park (2000)*: This merger was not filed under HSR, and was consummated in 2000 without agency review. The FTC challenged the transaction in 2004, ultimately prevailing at trial in 2007. Because the integration of the two facilities occurred many years prior, the FTC concluded that divesting the acquired hospital would be too costly and risky, instead opting for a conduct remedy. Kwoka relies on Haas-Wilson & Garmon's (2011) analysis of the *Evanston/Highland Park* transaction. The data period for this study was 1998 to 2002. As with the two *Xidex* mergers discussed previously, *the empirical analysis was post-merger, but pre-remedy*. Thus, Haas-Wilson & Garmon (2011) provides no insight regarding the effectiveness of the FTC's remedy, and thus provides no support for Kwoka's conclusion that conduct remedies have been ineffective.

  With only four conduct remedy transactions in his sub-sample, eliminating *Evanston/Highland Park* from Kwoka's sample would reduce substantially the overall average price increase (16.03%) reported in Table 7.9. Haas-Wilson & Garmon (2011) reported large estimated average price effects from this transaction (20%-35%, depending on the choice of regression specification and control group).[37]

In conclusion, of the four conduct remedies studied, only one (*General Mills/Ralcorp)* provides any information about the effectiveness of the remedy in restoring the pre-merger state of competition in an HSR setting. The other three studies involved consummated mergers;

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believe that this acquisition violates Section 7 of the Clayton Act. Ordinarily, such facts would lead the Commission to seek a preliminary injunction in federal district court. However, the acquisition was not reportable under the Hart-Scott-Rodino Act, and was consummated before Commission staff was able to open an investigation to explore the competitive effects of the acquisition. Consequently, the Commission never had the opportunity to consider seeking a preliminary injunction under Section J 3(b) of the FTC Act to prevent the acquisition from being consummated. Under these circumstances, the Commission is left with less effective or more costly remedial options. Divestiture of the acquired hospital is not an appealing remedy. The acquired hospital has been converted to a skilled nursing/rehabilitative care facility – it no longer operates as a hospital -- and the costs of conversion back to a hospital would, even under the best of circumstances, be substantial, with no guarantee of success. In addition, subsequent to the acquisition, Sutter Health, a major Northern California hospital chain, announced plans to construct an acute care hospital in Santa Cruz, which would restore a third hospital competitor in the market." Because a possibility existed that timely competitive entry into the relevant market might occur, and because forcing a divestiture faced a high risk of asset failure, the FTC chose to impose a "prior approval" remedy on Dominican – that is, Dominican was barred (for 10 years) from acquiring any other hospitals in Santa Cruz County without first obtaining the approval of the FTC.

[37] See Haas-Wilson & Garmon (2011), Table 2, p. 27.

and in two of those cases, the studies provided no information about post-remedy competition, and thus cannot support Kwoka's conclusion. In the one study that did examine post-remedy competition (*Dominican/AMI*), there was never an expectation that the pre-merger state of competition could be restored. We conclude that there is virtually no support for Kwoka's conclusion about the ineffectiveness of conduct remedies.

It is not surprising that Kwoka's sample contains only one transaction where either the FTC or DOJ attempted to remedy an HSR-reportable, purely horizontal transaction with a conduct remedy. As noted above, the federal agencies prefer structural relief in horizontal mergers. Conduct remedies normally supplement structural remedies, resolve vertical competitive concerns, and address other special circumstances. The fact that the only relevant transaction in Kwoka's sample occurred in 1997, nearly 20 years ago, reinforces that conduct relief is the exception rather than the norm in U.S. merger policy.

III. **Kwoka's estimated price effects: Methodological issues**

The empirical core of Kwoka's book is a meta-analysis of the estimated merger-induced price effects presented in the studies that he surveys. However, his analysis does not employ standard empirical methods because (a) he employs simple rather than weighted averages, and (b) no measures of statistical inference are provided.

The goal of meta-analysis is to synthesize optimally and rigorously the findings of a series of empirical studies. A standard text on meta-analysis describes the basic approach:

> "A key element in most systematic reviews is the statistical analysis of the data, or the meta-analysis. Unlike the narrative review, where reviewers implicitly assign some level of importance to each study, in meta-analysis the weights assigned to each study are based on mathematical criteria that are specified in advance. While the reviewers and readers may still differ on the substantive meaning of the results (as they might for a substantive study), the statistical analysis provides a transparent, objective, and replicable framework for this discussion."[38]

To see how standard meta-analytic methods might have been applied to a set of retrospective merger analyses, consider first a single retrospective study of a single merger in which competition in only one antitrust market might have been affected. As explained by Kwoka (2015, p. 59), in a "difference-in-differences" analysis the researcher would estimate the following equation using pre- and post-merger price data on both the merged firms and "control" firms:

$$P = \alpha + \beta MERGE + \gamma POST + \delta MERGE*POST + \varepsilon,$$

[38] Borenstein et al. (2009, p. xxiii).

where P is the firm's price; MERGE = 1 if the observation is for the merged entity, 0 if it is for a control firm; POST = 1 if the observation is from the post-merger period, 0 otherwise; and ε is a random error term.

In this analysis, the parameter "δ" is the estimated price effect of the merger. Because this parameter is estimated from a sample of data, there will be an associated estimated standard error that reflects the precision of the estimate. If, for example, the price data exhibit substantial variation unrelated to the timing of the merger, then this standard error will tend to be large, making it difficult for the analyst to be confident that the estimated value of δ is capturing systematic differences in pre- and post-merger pricing behavior. Using the estimated value of δ and its standard error, the researcher will test the hypothesis that prices remained the same after the merger, versus the hypothesis that prices changed.[39]

Now consider a set of merger retrospective studies. Each study will produce its own estimated δ, the estimated price effect of the merger that is the subject of the analysis. Each study also will produce an estimate of the standard error of δ, which is a measure of the precision of the estimate.

A very basic meta-analysis of these studies would compute an average of these estimated δ's (call this average "Δ", since it is the average of the individual δ's), yielding an overall estimated average price effect. The starting point in a basic meta-analysis would compute a *weighted* average of these δ's, where each estimated δ would receive a weight reflecting its corresponding standard error.[40] The logic for this weighting procedure is straightforward (and reflects standard econometric practice): estimates of δ that are imprecisely estimated (i.e., that have large standard errors) receive low weights, while estimates of δ that are precisely estimated (i.e., small standard errors) receive larger weights.[41] The meta-analysis also would calculate a standard error for Δ, which would be a function of the estimated standard errors of the δ's.

Once these computations have been completed, the reviewer usually would then conduct formal hypothesis tests.[42] Here, one would test the null hypothesis that $\Delta = 0$ (analogous to the test that is performed in each of the individual underlying studies, where the chief objective of each study is to test the hypothesis that $\delta = 0$).

[39] That is, the researcher will test the hypothesis that $\delta = 0$, against the alternative that $\delta \neq 0$ using a t-test, where the test statistic equals δ/(standard error of δ).

[40] More precisely, it would be weighted by the inverse of the estimated *variance* (i.e., the square of the standard error) of δ. According to Borenstein et al. (2010, p. 99), "the majority of meta-analyses assign weights to each study based on the inverse of the overall study error variance (that is, 1/variance)."

[41] This is the same estimation criterion employed by generalized least squares in the case of pure heteroscedasticity. See, e.g., Goldberger (1991, pp. 300-01).

[42] As one leading text on meta-analysis states, "[o]ne of the first questions asked of a study is the statistical significance of the results . . . if the goal of a synthesis is to test the null hypothesis, then meta-analysis provides a mathematically rigorous mechanism for this purpose" (Borenstein et al., 2009, p. 11).

Kwoka does not use any of these standard meta-analytic techniques. He does not weight his observations by their estimated standard errors when he computes the price effects reported earlier in Table 1. [43] The absence of weighting by standard error means that imprecise estimates of price effects receive the same weight as sharply estimated effects, which is a substantial departure from standard meta-analytic (and econometric) methodology.

More importantly, Kwoka does not provide *any* estimated standard errors for his estimated average price effects. This makes hypothesis testing – the primary objective of virtually all empirical analyses – impossible. One would like to see tests of the null hypothesis that the price effects reported above in Table 1 are equal to zero, or that they are equal to one another. The absence of standard errors makes this impossible.

To illustrate the potential importance of computing a weighted versus an unweighted average, consider the following example. Suppose one wished to conduct a meta-analysis of three merger retrospectives with the following estimated price changes (the δ's from the equation above) and corresponding standard errors (in parentheses): -5% (2.5%); 10% (5.5%); and 20% (16%). A simple unweighted average of the three studies would yield an overall average price effect of 8.3 percent. By contrast, an "inverse variance" weighted average – whereby parameter estimates with small variances (i.e., greater precision) receive greater weight – is *negative* 1.99 percent rather than *positive* 8.3 percent.[44] The standard error of this overall average can then be easily calculated, allowing the researcher to conduct hypothesis tests and to construct confidence intervals.[45] In this example, the standard error of the unweighted mean in 5.69, while the standard error of the weighted mean is considerably smaller (2.32), reflecting the fact that the latter has made efficient use of the information in the sample to more precisely estimate the mean effect.[46]

The procedure described in this example assumes implicitly that the only relevant variance is the "within-study" variance, as measured by the standard error on each δ. That is, the procedure assumes that the true value of δ in each study is the same, with the estimated values

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[43] Kwoka (2015) does not appear to discuss explicitly how he weights his observations when computing these mean price effects. However, in his earlier meta-analysis of merger effects (Kwoka 2012, p. 630), Kwoka states that the method used in that paper "gives each study of a particular transaction equal weight." We assume that the same method was used in Kwoka (2015).

[44] The formula for the simple "inverse variance" average estimate is Σ (w(i)β(i)/ Σw(i), where the weights (w(i)) are the estimated variances of the estimated price changes (β(i)) from the individual studies [= 1/[S.E.(β(i)]^2]. In this example, this average is computed as { {$(1/2.5)^2$ * -5)] + [$(1/5.5)^2$ * 10)] + [$(1/16)^2$ * 20)]}/{ [$(1/2.5)^2$ + [$(1/5.5)^2$ + $(1/16)^2$] }. See Borenstein et al. (2010).

[45] The variance of this mean equals 1/{ [$(1/2.5)^2$ + [$(1/5.5)^2$ + $(1/16)^2$]} = 5.38. The standard error is the square root of this variance and equals 2.32.

[46] Many standard software packages (e.g., Stata) include commands specifically for this purpose. See, e.g., Harris et al. (2008)

differing only because of sampling error.[47] Typically, however, there also will be variance in the true values of δ *across* the studies in the meta-analysis. That is surely true here, given that the studies reviewed by Kwoka cover many different industries in many different time periods. There is no expectation that all would experience similar merger-induced price changes.

It is straightforward to incorporate this additional source of variance into the meta-analysis.[48] Essentially, the weight assigned to each study is adjusted to take account of not just the within-sample variation (as reflected in the reported standard errors for the δ's), but also the between-study variation in the δ's. Compared to the example given above, where the weight applied to each study was 1/variance(δ), the new weight would equal 1/[variance(δ) + T^2], where T^2 is a measure of the across-study variance in the δ's.[49] The estimated variance of the overall mean effect (i.e., Δ) also will be adjusted to take account of this additional source of variance.

As noted, Kwoka (2015) does not report *any* standard errors for his estimated price effects, which renders impossible hypothesis testing. However, he does provide evidence that there is substantial variation both across different studies, as well as within individual studies. Had this variation been taken properly into account, it is plausible (if not likely) that the resulting average price effects would differ from those reported in Table 1. It also is plausible, if not likely, that the estimated standard errors for these averages would be substantial, with obvious implications for hypothesis tests about the value of Δ.

For price effects estimated at the *transaction* level, Kwoka Table 7.1 reports price changes ranging from -16.3 percent to 29.4 percent. For price effects estimated at the *product* level (Kwoka Table 6.3), the estimates range from -16.3 percent to 52.4 percent. Thirteen of the 49 transactions (more than one quarter of his data sample) exhibit a price decrease.

At the *product* level, 46 of the 119 products (about 38.7 percent) in his database exhibit post-merger price *decreases*. The *mean* product-level price effect is 4.31 percent, compared to a *median* of only 0.8 percent (Kwoka p. 94), suggesting a distribution with a small number of large price increases.[50] Indeed, Kwoka states that 31% of the product-level price changes are clustered in the +/- 1% range (2015, p. 95).

In other words, Kwoka's sample of 49 transactions exhibits a considerable range of positive and negative price effects, with many near zero. Nonetheless, Table 1 shows that Kwoka calculates substantial average (unweighted) price *increases* for all six categories of agency

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[47] In the terminology of meta-analysis, this assumption is known as the "fixed effects" model. See Borenstein et al. (2009, ch. 11).
[48] In the terminology of meta-analysis, this assumption is known as the "random effects" model. See Borenstein et al. (2009, ch. 12).
[49] See Borenstein et al., (2009, ch. 12).
[50] As noted by Borenstein et al., (2009, p. 79), one effect of this weighting scheme is often to diminish the influence of large outliers on the overall mean effect.

actions. This invites the conjecture that his unweighted averages depend critically on a small number of studies reporting substantial price increases, and that the calculated values of these averages would not be robust to the application of alternative (but standard) weighting choices. One also questions whether one would reject the null hypothesis that $\Delta = 0$, had Δ and its standard error been estimated using standard meta-analytic procedures.

IV. Have the Federal agencies become "more lenient" over time?

Kwoka criticizes the antitrust agencies not only because of (in his view) ineffective merger enforcement, but also because he believes the agencies have become increasingly lenient over time. Does his evidence support his conclusion?

Kwoka's characterization of increased enforcement leniency relies principally on a tabulation of enforcement actions by decade, for all transactions, and for mergers separately. Using only the data for "all transactions," he then calculates the proportion of actions cleared, performing a large sample "equality of proportions" test to assess whether the 1980's and 2000's percentages differ. Table 2 reports the results of his tabulations for both a "narrow" definition of "cleared" (only when the agencies explicitly clear a transaction) versus an "expanded" definition (which includes cases with no explicit approval statement from the agencies).[51] Using the first column of Table 2, Kwoka compares the proportion of cases cleared in the 1980's (0 of 5 = zero) to the proportion cleared in the 2000's (3 of 7 = 0.43). A large sample test of the hypothesis that the two proportions are equal yields a p-value of 0.09.[52] Based on this, Kwoka concludes the data show a "more accommodating policy . . . that reflects a bona fide policy change" (Kwoka, 2015, p. 117).

[51] These data are taken from Kwoka, Tables 7.5 and 7.6 (pp. 116-17).
[52] Kwoka reports a significance level of 0.055 (Kwoka, p. 117). However, he appears to have made an error in his calculation; the actual p-value is approximately 0.09.

Table 2: Kwoka summary of agency decisions to "clear" transactions, by decade[53]

	Narrow definition of "cleared"		Expanded definition of "cleared"	
	All transactions	**Mergers only**	**All transactions**	**Mergers only**
1980's	0/5	0/5	5/10	5/10
2000's	3/7	3/6	4/8	4/7
Asymptotic test of equal proportions p-values	p = 0.09	p = .06	p = 1.0	p = .0.78
Fisher's Exact Test of equal proportions p-values	p = 0.21	p = 0.18	p = 1.00	p = 1.00

Table cell entries in rows 1 and 2 are the number of cases "cleared" divided by the total number of cases. Under the narrow definition of "cleared," cases are included only if the agency publicly announced that it was closing the investigation of the transaction without an enforcement action. For the expanded definition, any case lacking an enforcement action is considered cleared, even if there was no public announcement from the agency.

We note first that the "equality of proportions" statistical test used by Kwoka assumes an (asymptotically) normal distribution. While asymptotic assumptions of normality are valid in large samples, this assumption may not hold for small sample sizes (such as we have here). A better alternative for small samples is "Fisher's Exact Test," which does not rely on asymptotic approximations to the normal distribution.[54] As shown in the bottom row of Table 2, Fisher's Exact Test yields a p-value of 0.21 using Kwoka's "narrow" sample, which fails to reject (at conventional levels of significance) the null hypothesis of no differences between the 1980's and 2000's. One reaches the same conclusion when one conducts a test of this null hypothesis using the data in column 2 of Table 2, which computes these proportions using data for mergers only; the relevant p-value is 0.18, which leads to acceptance of the null hypothesis at conventional levels of significance.

This technical point about large sample versus small sample tests aside, a more important criticism is that Kwoka only performed his test on the data from the first column of Table 2; i.e., all transactions using a narrow definition of cleared. However, Kwoka presents an alternate set of figures using a more broad definition of cleared, reported in the last two columns of Table 2. When one compares proportions of 1980's versus the 2000's for these alternate values (using Fisher's Exact Test), one accepts the null hypothesis that the proportions were equal in the two

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[53] These figures are from Kwoka's Tables 7.5 and 7.6 (pp. 116-17).

[54] In large samples (e.g., where the number of observations is at least 30), one can use the normal probability distribution to test hypotheses about the equality of proportions in different populations. But when sample sizes are small, as they are here, the preferred statistical test of the null hypothesis of equal proportions would use "Fisher's Exact Test", which does not rely on asymptotic approximations to the normal distribution. See http://udel.edu/~mcdonald/statfishers.html.

decades. Using Kwoka's alternate definition of cleared, his conclusion that the two decades differ lacks statistical support.

Other sections of Kwoka's book also undermine his conclusion that enforcement has become more lenient. Specifically, Kwoka Table 2.10 (2015, p. 34) summarizes FTC data from Coate (2013) reporting the percentage of FTC HSR merger investigations resulting in enforcement actions.[55] Figure 1 graphs these data, showing the percentage of merger investigations resulting in enforcement actions is higher in every year during the 2000's relative to 1989, the only year from the 1980's for which Coate provides data. More importantly, the percentage of cases with enforcement actions has increased every year since 2004. This does not support the proposition that federal agency policy has become more lenient over time.

One can also assess whether "recent merger control has not been sufficiently aggressive"[56] by examining the recent cases contained in Kwoka's sample, which consists of the following seven mergers during the 2000's:

- *Exxon/Mobil* (2000): This merger was approved conditional on asset divestitures. As described earlier, GAO found a price increase using a disputed methodology. Applying a more accepted methodology, the FTC found very different results.

- *Evanston/Highland Park* (2000): As described earlier, the underlying academic study does not analyze the impact of the remedy in this non-HSR reportable transaction, but rather examines the effect of the merger in the period immediately following the merger. The FTC challenged this consummated merger in court, ultimately succeeding in 2007.

- *Victory/Provena St. Therese* (2000): This hospital merger also fell below HSR thresholds, and thus was investigated by the FTC post-consummation. Ultimately, the FTC did not find sufficient evidence to challenge it. As Kwoka notes, the underlying academic study (Haas-Wilson & Garmon, 2011) finds that this merger resulted in lower prices.

- *Sunoco/El Paso* (2004): Sunoco purchased a New Jersey petroleum refinery from El Paso. The FTC concluded that the merger would not create market power because sufficient alternative sources of reformulated gasoline were available. Silvia and Taylor (2010) found that this acquisition had no adverse competitive effect, i.e., no increase in prices.

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[55] The numerator consists of mergers that either were (1) challenged in court; (2) approved conditional on a negotiated settlement; or (3) abandoned after the FTC announced its intention to challenge in court. The denominator is all merger cases where the FTC issued a "second request." This does not include matters remedied through consent without issuance of a second request.
[56] Kwoka (2015, p. 158).

- *Valero/Premcor* (2004): Valero acquired petroleum refiner Premcor, making Valero the largest refiner of crude oil in the United States with a 13 percent share. Silvia and Taylor (2010) found that this merger was competitively neutral.

- *J&J/Pfizer* (2006): As described earlier, this merger was cleared subject to a remedy that Tenn & Yun (2011) found to be effective.

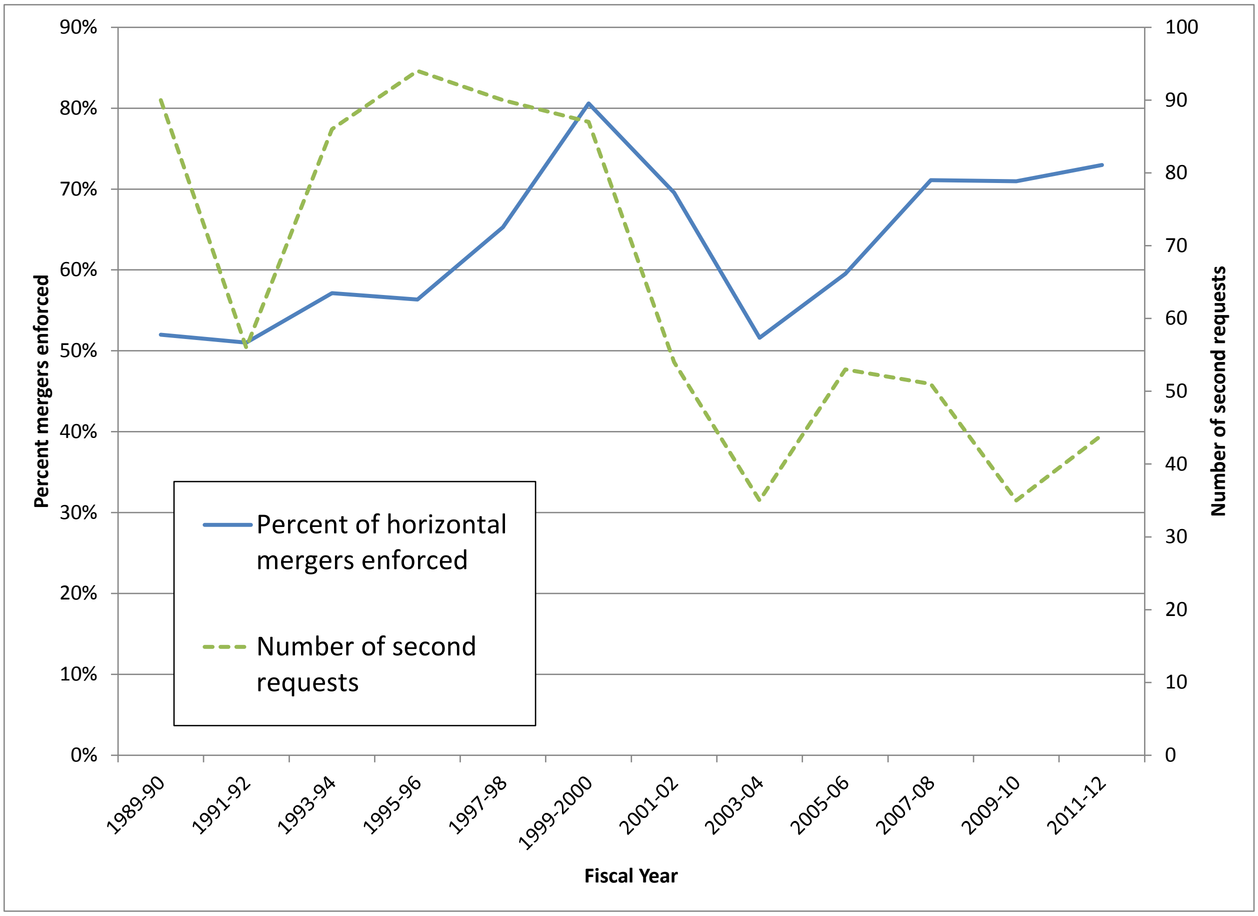
- *Whirlpool/Maytag* (2006): Whirlpool and Maytag were two of the four largest domestic appliance manufacturers. The DOJ approved the merger in 2006. Ashenfelter, Hosken, and Weinberg (2013) find differing levels of price effects across types of appliances, with the largest increases in dishwashers and clothes dryers.

In summary, of the seven mergers in the 2000's that Kwoka analyzes, four exhibited no increase in post-merger (or post-remedy) prices (*Victory/Provena; Sunoco/El Paso; Valero/Premcor; J&J/Pfizer*); one had disputed results (*Exxon/Mobil*); one represented a successful challenge to a consummated merger (*Evanston/Highland Park*); leaving only one (*Whirlpool/Maytag*) indicative of potentially lax enforcement.

This evidence does not support a conclusion that recent merger enforcement policy has been insufficiently aggressive. If anything, it highlights a flaw in Kwoka's analysis: he examines only the number of agency actions by decade without consideration of the merger effect. As shown above, all but one cleared merger in the 2000's exhibited neutral or ambiguous price effects. Simply comparing the prevalence of enforcement actions by decade implicitly assumes a comparable risk of potential competitive harm over time. As noted earlier,[57] Kwoka has stated elsewhere that the nature of mergers has changed, rendering transactions as recent as the 1990's a poor basis for assessing current policy. It remains unclear why he deems appropriate a comparison of 1980's and 2000's.

[57] *Supra* note 11.

Figure 1: Percent of Mergers Investigations with Enforcement Actions, 1989-2012



Note that in 2001 the Hart-Scott-Rodino thresholds were revised upwards (the $15.0 million filing threshold increased to $50.0 million -- inflation adjusted), which accounts for the subsequent decline in second requests.

Source: Coate (2013)

V. Conclusion

Kwoka's 2015 book provides a useful overview of merger policy, as well as a valuable review of the academic literature on merger retrospectives. One should not underestimate the effort required to canvas thirty years of academic publications.

We sympathize with the goal of using retrospective analyses to assess the performance of the antitrust agencies and to identify possible improvements. Unfortunately, Kwoka has drawn inferences and reached conclusions about contemporary merger enforcement policy that are unjustified by his data and his methods. His critique of negotiated remedies in merger cases relies on a small number of transactions; a close reading reveals that a number of them are silent on the effectiveness of the associated remedies. His data sample lacks diversity, relying heavily on a small number of studies conducted on a small and unrepresentative set of industries. His statistical methodology departs from well-established techniques for conducting meta-analyses, making it impossible for readers to assess the strength of his evidence using standard statistical tools. His conclusions about the growing permissiveness of enforcement policies lack substantiation. Overall, we are unpersuaded that his evidence can support such broad and general policy conclusions.

None of this is to claim that contemporary antitrust enforcement is, in any sense, perfect. Antitrust enforcers invariably will make mistakes, and agencies like the FTC engage in a continuous process of self-assessment and self-improvement. Indeed, many of the studies in Kwoka's sample were conducted by FTC economists, and the FTC currently is engaged in its second large-scale assessment of its merger remedies.

We agree with Kwoka that the benefits of additional merger retrospectives would outweigh the costs. His book "provides a compelling argument for the value of merger retrospectives and certainly for doing more of them."[58] Looking ahead, we anticipate that the retrospective merger analysis will continue to figure prominently in the FTC's research agenda, and we hope the same is true of the academic community.

[58] Kwoka (2015, p. 160).

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Appendix

KwokaTable 6.2

List of single mergers in price database

Firm 1	Firm 2, (3)	Transaction type	Transaction year
Scott Graphics	Xidex	Merger	1976
Kalvar	Xidex	Merger	1979
Weyerhaeuser	Menasha	Merger	1980
SCM	Gulf & Western	Merger	1983
Lone Star Industries	Kaiser Cement	Merger	1985
Northwest Airlines	Republic Airlines	Merger	1986
Ozark Airlines	Trans World Airlines	Merger	1986
Texas Air	People Express	Merger	1987
Delta Airlines	Western Airlines	Merger	1987
USAir	Piedmont Aviation	Merger	1987
Dominican Santa Cruz Hospital	AMI-Community Hospital	Merger	1990
Wolters Kluwer	Lippincott	Merger	1990
Reed Elsevier	Pergamom	Merger	1991
Continental Airlines	America West Airlines	Code share	1994
Northwest Airlines	Alaska Airlines	Code share	1994
Burlington Northern	Santa Fe Pacific	Merger	1995
Thomson	Shepard's	Merger	1995
Wolters Kluwer	CCH	Merger	1995
Reed Elsevier	West Publishing (divested)	Merger	1996
Thomas	West Publishing	Merger	1995
Union Pacific	Southern Pacific	Merger	1995
Wolters Kluwer	Little, Brown	Merger	1996
Aurora Foods	Kraft's Breakfast Syrup	Merger	1997
General Mills	Ralcorp	Merger	1997
Guinness	Grand Metropolitan	Merger	1997
Proctor and Gamble	Tambrands	Merger	1997
Tosco	Unocal	Merger	1997
UDS	Total	Merger	1997
Wolters Kluwer	Thomson, Waverly, Plenum	Merger	1997
BP	Amoco	Merger	1998
Harcourt	Churchill Livingstone, Mosby	Merger	1998
Marathon Oil	Ashland	Joint Venture	1998
New Hanover Regional Medical Center	Columbia Cape Fear Memorial Hospital	Merger	1998
Pennzoil	Quaker State	Merger	1998
Reed Elsevier	Matthew Bender	Merger	1998
Shell Oil	Texaco	Joint Venture	1998

Table 6.2 (continued)

Firm 1	Firm 2,(3)	Transaction type	Transaction year
Shell Oil	Star Enterprises	Joint Venture	1998
Continental Airlines	Northwest Airlines	Code share	1999
Fleet Financial	BankBoston	Merger	1999
MAP	UDS	Merger	1999
Sutter	Summit Medical Center	Merger	1999
Exxon	Mobil	Merger	2000
Evanston Northwestern Healthcare	Highland Park	Merger	2000
Provena St. Therese Medical Center	Victory Memorial Hospital	Merger	2000
Delta	Northwest, Continental	Code share	2003
Sunoco	El PasoEagle Point	Merger	2004
Valero Energy	Premcor	Merger	2004
Johnson & Johnson	Pfizer	Merger	2006
Maytag	Whirlpool	Merger	2006