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Challenges for Economic Analysis of Mergers Between Potential Competitors: Steris and Synergy

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POTENTIAL COMPETITION MERGERS occur when one of the parties of a proposed merger is already competing in a particular market while the other merging party has not yet entered that market. Under a potential competition theory of harm, a merger between two companies may harm competition if, absent the merger, one of the merging firms would enter the relevant market and compete with its proposed merger partner, which is already an incumbent in the relevant market. The theory of harm in potential competition cases hinges on the predicted increase in future competition that consumers in a relevant market may be denied as a result of the merger.

As with the analysis of competitive effects pertaining to any merger, the goal in a potential competition case is to predict the likely postmerger competitive dynamics. However, as a former Commissioner of the Federal Trade Commission acknowledged, analysis of a merger involving a potential competitor "presents a number of unique challenges not confronted in a typical merger review."[1] While all merger analysis is inherently forward looking, a potential competition merger presents complications in gathering information on the key inputs to merger review, including (1) defining the relevant antitrust market in which to assess the merger's competitive effects, and (2) assessing the extent of likely substitution among buyers in the "but-for" scenario, i.e., a scenario in which the merger does not occur and the potential entrant enters. In situations where the potential entrant plans to bring a new product to market, assessing the impact of the merger on the combined firm's incentives to innovate will also be relevant.

The FTC's failed attempt to enjoin the acquisition by Steris Corporation of Synergy Health plc in 2015 is one of the few mergers between potential competitors challenged by the FTC in the last decade and presents a suitable setting to analyze these issues. In that transaction, the FTC argued that the merger would have eliminated a potential competitor in the U.S. market for contract sterilization of medical devices, pharmaceuticals, and other products (e.g., lab animal feed, spices, cosmetics).[2] Specifically, the FTC alleged that, in the absence of the merger, UK-based Synergy would have entered the U.S. market with a disruptive technology—X-ray radiation sterilization—to compete with existing technologies for contract sterilization provided by Steris and other incumbents, and that this entry would have resulted in lower prices for customers.

The merger of Steris and Synergy is sometimes referred to as a missed opportunity to examine the potential competition doctrine. Despite the limited role played by market definition and competitive effects in the court's decision,[3] the case still provides important insights on the role of economic analysis in potential competition cases.

Constructing the "But-For" World Absent the Merger

Unlike the analysis of mergers between incumbent firms in a relevant market, a merger between an incumbent firm and a potential entrant requires constructing and studying the world that would have existed absent the merger, often called the but-for world. Defining the appropriate but-for world is the foundation for any competitive effects analysis, as it determines the competitive conditions that would reasonably prevail absent the merger, including the extent of competition that would have been provided by the potential entrant. Establishing the appropriate but-for world must include an assessment of whether entry would ultimately be profitable for the potential entrant to undertake and, if so, whether such entry would (1) occur in a timely manner and (2) have a measurable effect on competition.[4] Indeed, establishing the appropriate but-for world and unpacking the relevant assumptions on entry were key inputs for the court's decision in the *Steris-Synergy* merger.

The profitability of entry often hinges on the price at which the potential competitor intends to sell its product and the demand for the new product at that price. The price for the new product is influenced by prevailing and predicted prices for existing competing products as well as the need for the potential entrant to cover its production costs. If the new product is demonstrably superior in quality compared to existing products, the entrant may be able to charge a premium price or cause existing competitors to lower their quality-adjusted prices. Even in such situations, the ability of the potential entrant to charge a premium price may be condi-

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tional on other factors, such as reputation, the availability of after-sales service for the entrant's product (if applicable), and exogenous market factors.

In instances where the potential entrant is offering a new technology or product that has not yet been available to customers in the relevant market, as was true for Synergy, pricing of the entrant's product may be affected by switching costs and potential risks for the safety and efficacy of a new product that customers face in moving from existing products to the potential entrant's product. That is, the price at which the potential entrant offers its product must provide existing customers with an economic incentive or, in combination with other features of the new product (nonprice benefits), a value proposition to entice them to switch from the incumbents' products to the potential entrant's new product.

The potential entrant must also consider how existing firms may respond to its entry. Depending on the product configuration (i.e., pricing, quality, and features) chosen by the potential entrant, entry might result in a price war, with incumbents (and the entrant) aggressively cutting prices to maintain (or gain) market share. It is the final price at which the entrant would be able to sell its product that should be used to assess whether entry would be profitable. That price may be higher or lower than the price assumed by the potential entrant in its business plan for entry.

The court's decision in *Steris-Synergy* illustrates why a business plan for entry cannot, by itself, be used as definitive proof of profitable entry. Rather, that plan sets some expectation of entry that must be weighed against the validity of the assumptions underlying that expectation, the potential entrant's efforts to enter, and the success of those efforts thus far—the ultimate question being, will the potential entrant continue, absent the merger, to pursue entry at the same rate and/or scope?[5] Both the FTC and the merging parties agreed that Synergy had prepared a business plan for entry and had been working to execute that plan. However, there was disagreement over whether the business plan by itself, when weighed against the success of Synergy's efforts to implement the plan, was sufficient to show that Synergy had a reasonable probability of successful entry but for its merger with Steris.

The FTC noted that the profitability assumptions in Synergy's business plan were driven, in part, by a notion that it would be able to convince customers to switch sterilization methods in spite of the switching costs involved. These assumptions were based on the purported benefits offered by X-ray sterilization over existing sterilization methods, such as X-ray's faster turnaround times, X-ray's ability to simultaneously process products requiring different dosages of sterilization, and the resulting reduction in oxidation and discoloration of plastic products from X-ray sterilization.[6]

The FTC also pointed to potential exogenous market factors that might support Synergy's assumptions regarding customers switching to X-ray sterilization, particularly from gamma radiation sterilization. Cobalt 60 is the principal input into gamma sterilization services (like those provided by Steris), and its supply is entirely controlled by Sterigenics, the only other U.S. provider of contract gamma sterilization services.[7] The FTC argued that contract sterilization customers were concerned that possible future supply shortages of cobalt 60 meant that Steris might start charging higher prices for gamma sterilization services in the future, and that this concern would propel the growth of X-ray sterilization.[8]

The merging parties noted that revenue projections in Synergy's business plan were predicated on Synergy generating a certain level of customer demand for its X-ray sterilization at its projected entry price point, including some assumptions regarding future supply shortages of cobalt 60.[9] However, in working to implement the business plan, Synergy learned that many customers were unwilling to switch from their existing method of sterilization to Synergy's X-ray sterilization at the proposed price. This reluctance to switch was largely driven by the extensive switching costs involved, especially for products like class II and class III medical devices.[10] The success of Synergy's business plan hinged in part on convincing these high-margin customers to switch to X-ray sterilization.

For these customers, changing from their existing sterilization method to Synergy's X-ray would have meant incurring: (1) costs to test Synergy's X-ray sterilization to ensure the proper level of sterility could be achieved; (2) costs to obtain the required regulatory approvals, and (3) customer personnel time and resources related to these activities.[11] Furthermore, customers would need to incur these costs for all products for which X-ray sterilization would be used and at every facility at which X-ray sterilization was to be provided.[12]

The merging parties argued that the nature and magnitude of these costs could vary by customer and would not be fully known to Synergy until after entry had occurred and customers had obtained the opportunity to test their product at Synergy's X-ray sterilization facilities. As a result, Synergy did not have the ability (or the knowledge) to fully incorporate this uncertainty into its pricing. In the merging parties' view, this called into question the likelihood that Synergy's entry would ever be profitable and ultimately raised doubts about whether Synergy would have any material impact on competition in contract sterilization services as a potential entrant.

In the end, the court concluded that, absent the merger, Synergy would not have entered with its X-ray sterilization product "within a reasonable period of time" based, in part, on the unsubstantiated assumptions in Synergy's business plan and the low probability that Synergy would be able to surpass the hurdles necessary to make entry profitable.[13]

Thus, a key lesson for analysis of future potential competition cases is that a potential entrant's business plan supporting entry provides only a starting point for assessing the profitability of entry. Careful consideration is needed of market realities and the sensitivity of key assumptions in the business plan on profitability of entry.

If one were to conclude on the basis of available evidence that entry would have occurred in the but-for world, the analysis of the competitive effects of such entry would then depend on assumptions regarding: (1) the price at which the potential entrant might offer its product; (2) the magnitude of customer demand for the potential entrant's product; (3) when the potential entrant would offer its product; and (4) whether the scope of entry would be immediate or occur over time. We turn to these considerations next and discuss how these analyses might have played out had the FTC succeeded in its preliminary injunction and the matter had proceeded to a full trial on the merits.

Determining the Relevant Product Market[14]

In potential competition cases where the new entrant will bring a new product or technology to the market, the market definition exercise can be complicated due to the lack of observable data on competition (and therefore, economic substitution) between the new product and existing products sold by incumbent firms. The products do not compete at present, so existing sales data cannot be used to compute price correlations and cross-price elasticities across the products, and there are no win-loss bidding files to show actual customer choices between the products.[15] As a result, defining the relevant market in this type of potential competition case tends to rely heavily on:

- arguments regarding functional substitution between the incumbents' products and the potential entrant's product;
- statements made by customers regarding their willingness to substitute to the potential entrant's product; and
- ordinary course documents created by the merging parties regarding expected substitution and competition from the potential entrant.

The FTC largely relied on such evidence in the *Steris-Synergy* case. The FTC defined the relevant market as no bigger than U.S. contract radiation sterilization services (E-beam, gamma, and future Synergy X-ray), and in certain instances only gamma and X-ray sterilization.[16]

Below we discuss the evidence that would have likely been put forth by the FTC and the merging parties on relevant product market definition and how this evidence might have been used had the case proceeded to a full trial on the merits. This hypothetical example illustrates the complexity of the market definition exercise in potential competition cases, including the difficulties that would be faced by both the enforcement agencies and the merging parties in defining the contours of the relevant market. It also illustrates the interdependency between the relevant market definition exercise and the assumptions underlying the entrant's business plan for profitable entry.

Functional Substitution. In the absence of historical data on the extent of economic substitution between the merging parties' products, there is a tendency to rely heavily on functional substitution. An economic substitute is a product to which customers would turn in the face of an attempted price increase for another product in the relevant market, holding all else constant. This definition relies entirely on customer willingness to switch and does not require the products to share all of the same features. Products that are purely functional substitutes (i.e., share features) may not be in the same relevant market if customers do not substitute between them in sufficient numbers in response to changes in relative prices.

The FTC's relevant product market definition in the *Steris-Synergy* merger relied, in part, on arguments regarding functional substitutability between Synergy's proposed X-ray sterilization and Steris's existing gamma sterilization.[17] In doing so, the FTC charted the similarities between gamma sterilization and X-ray sterilization, including each method's superior ability to sterilize dense products or products densely packaged, as compared to other radiation sterilization methods, such as E-beam.[18] However, the FTC acknowledged that E-beam sterilization could become a closer substitute for gamma sterilization in the future as a result of customer concerns regarding the supply of cobalt 60, the principal input into gamma sterilization. As a result, the FTC appeared to take the position that absent entry by Synergy, customers would not (and in some instances, could not) have switched to contract E-beam sterilization in response to an attempted postmerger price increase by Steris for gamma sterilization. Furthermore, the FTC appeared to conclude that the switching costs involved in making the transition from gamma to E-beam sterilization were significantly greater than the costs involved in making the transition from gamma to X-ray sterilization.

In contrast, putting aside future concerns regarding the supply of cobalt 60, the merging parties took the position that E-beam sterilization was already a viable alternative to gamma sterilization.[19] To the extent that customers could repackage their products in a way that makes them suitable for sterilization with E-beam (i.e., make them less dense), the merging parties might have further argued in support of E-beam being a viable economic alternative for a larger group of customers than pointed to by the FTC, and tried to back it up with evidence of historical customer switching between gamma and E-beam sterilization. Some of this evidence for customer switching may have also been garnered from Steris's planned expansion into E-beam at two of its gamma sterilization facilities.[20] The key would have been for the merging parties to demonstrate that customers would have switched to E-beam sterilization in sufficient numbers to defeat any unilateral price increase imposed for gamma sterilization.

Furthermore, the merging parties might have sought to downplay the projected substitution between X-ray and gamma sterilization (and thereby attempt to make a stronger argument for the inclusion of E-beam) by using the only available historical evidence on economic substitution between gamma and X-ray sterilization from Synergy's experience at its

sterilization plant in Däniken, Switzerland. According to the merging parties, for over two years prior to its announced merger with Steris, Synergy had operated both gamma and X-ray sterilization facilities at this plant, and was largely unsuccessful in efforts to convert class II and class III medical device customers from gamma to X-ray at seemingly the same and sometimes lower prices.[21] At trial, the FTC would have had to explain why these failed efforts would not have been informative of the potential economic substitution by U.S. customers between gamma and X-ray sterilization. The FTC would also have had to show why the small amount of economic substitution that did occur between gamma and X-ray sterilization was sufficient to put these services in the same relevant market for all customers, but why the similar substitution patterns between E-beam and gamma sterilization might not be sufficient to include E-beam in the relevant market for all customers.

Customer Statements. Customer statements regarding willingness to substitute the potential entrant's product for the products of incumbent firms can be informative for establishing the relevant market. However, these statements only reflect stated rather than revealed preferences, so it is uncertain how customers would actually behave in the but-for world when faced with these choices. In such instances, greater weight may be warranted for statements by customers that have internally studied the possibility of substituting to the potential entrant's new product or committed to future purchases of the product by signing binding contracts and/or subsidizing some portion of the potential entrant's costs to enter.

As part of its case, the FTC might have presented signed declarations from customers stating that these customers would be willing to substitute their existing contract gamma sterilization for Synergy's contract X-ray sterilization more readily than they would for contract E-beam sterilization. Historically, such customer statements have been difficult for the merging parties to rebut on their face. In response to these customer declarations, the merging parties might have presented rebuttal evidence showing that, while existing customers of contract radiation sterilization services had expressed interest in using Synergy's contract X-ray sterilization services, none had committed to actually filling Synergy's X-ray facilities with the purchase volumes needed for Synergy to realize the projections in its business plan regarding profitable entry.[22] Furthermore, the merging parties might have presented historical evidence from customers submitting declarations on actual substitution between gamma sterilization and E-beam sterilization.

Ordinary Course Documents. In potential competition cases, the assessment of the relevant market may also hinge on ordinary course documents created by the merging incumbent and other incumbent firms. Documents that speak to their concerns regarding future competition from the potential entrant's product may warrant greater weight than statements by the potential entrant about how its new product could be expected to compete with existing products.

In the *Steris-Synergy* merger, the FTC might have supported their relevant market definition by using ordinary course business documents prepared by Synergy that discussed plans to locate X-ray sterilization facilities next to existing gamma sterilization facilities. Furthermore, Synergy's business plan for X-ray sterilization assumed that it would be able to earn 15 percent of existing U.S. revenue from contract gamma sterilization services (according to Synergy's internal estimate), including from Steris, over a period of six to ten years, by the end of which Synergy hypothesized that it would have five X-ray sterilization facilities running at capacity.[23]

The time horizon over which the potential entrant would enter is also relevant for assessing the relevant market. Over a longer time horizon, customers may choose alternatives that they would not choose in the short-run (i.e., for technical reasons noted above), and other substitute products may emerge as a competitive constraint. The lengthy time period that Synergy projected for full entry with X-ray might have sparked a debate about how much impact these services could actually have on competition, and whether, as we discuss below, that competitive impact may have been achieved without Synergy's entry. Given the FTC's arguments regarding possible future supply shortages in cobalt 60, the long time horizon might also have raised questions as to the extent of future competition from E-beam sterilization.

In sum, while the general economic principles that underlie market definition for merger analysis involving current competitors can be applied for mergers between potential competitors, caution is warranted in interpreting the sources of evidence used to evaluate how customers will make decisions on substitution between existing and new products.

Of course, market definition is only a means to identify the set of firms that would be viable competitors in the but-for world (where new entry is attempted rather than the proposed merger) or that would exercise a competitive constraint on the merged entity (where the proposed merger proceeds), and in turn to evaluate how the merger will affect competition, as we discuss next.

Analyzing the Effect of a Potential Competition Merger on Future Competition

Analysis of Structural Measures of Competition. A potential competition merger presents different challenges from a merger of incumbent firms in estimating changes in market concentration and resulting competitive effects. As discussed earlier, the first step is to assess whether entry by the merger party would have occurred in the but-for world. In the absence of such predicted entry, the merger would have no likely competitive impact, given that the merging parties do not currently compete in the relevant market. Assuming that such entry would have occurred in the absence of the merger, assessing changes in market concentration in a potential competition case requires estimating the likely magnitude

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of deconcentration in the relevant market that the assumed potential entrant would induce in the but-for world.

Some degree of deconcentration may result from adding a new market participant, but estimating the extent of deconcentration in the but-for world requires assumptions (based on the factual record) about the likelihood, scale, and timing of potential entry, and predictions about the behavior of incumbent firms in anticipation of and following new entry. Consequently, estimating postmerger shares and HHIs in this scenario is more speculative and involved than in the analysis of mergers between actual competitors, and the weight to be accorded to such estimates will depend on the plausibility of new entry occurring.

Synergy's business plan would have been a logical starting point for estimating how much of a deconcentrating effect Synergy's entry with X-ray sterilization might have had in the but-for world. As discussed earlier, the underlying assumptions regarding price and customer demand in the business plan would have required reconsideration, given that customers appeared to be unwilling to switch to X-ray sterilization. Uncertainty about the plausibility of assumptions in Synergy's business plan suggests a range of possible outcomes and the difficulty of assigning a probability to each outcome.

The focus of economic analysis of competitive effects from a potential competition merger is to examine whether the magnitude of deconcentration would be sufficiently large that prohibiting the merger would result in significant benefits to consumers that would not be outweighed by the benefits of the merger. The consumer benefit resulting from an increase in competition could stem from reduced prices and/or the introduction of new technology that the entrant brings to the market. The merged firm might still have an incentive to bring the new technology to the market if it is determined to be a profitable use of resources (i.e., if cannibalization of its existing product is not very high). Thus, it is not clear that the merger would necessarily prevent customers from accessing the benefit of new technology. Of course, it could be argued, as the FTC did in its challenge of the Steris-Synergy merger, that even if the merged firm introduces the new product (X-ray sterilization services), customers lose the benefit of having Synergy as an independent producer of the new technology to compete with existing producers.[24]

The Horizontal Merger Guidelines consider market shares and concentration measures as one piece of evidence in assessing whether a merger may substantially lessen competition.[25] Thus, in addition to examining these structural metrics of competition, it is important to analyze the likely direct competitive effects of the proposed merger.

Assessment of Unilateral Effects. The central question in assessing the competitive effects of a potential competition merger is whether the merger would lead to a substantial lessening of future competition (1) by eliminating the competitive constraint on price increases that would have been imposed by the potential entrant, or (2) by reducing the incentives of the merged firm to innovate, given that a new product may cannibalize sales of the merging incumbent firm's existing products. This was one of the concerns highlighted by the FTC in its court case to enjoin the Steris-Synergy merger, specifically that postmerger Steris "likely has significantly less incentive to bring competitive [X]-ray sterilization services" to the market, in comparison to "an independent Synergy."[26]

A key component of assessing unilateral effects of any merger is estimating the diversion of sales between the merging parties. This acts as a measure of substitutability between the merging firms' products and gauges the incentives of the firms to increase prices postmerger above levels that would have prevailed absent any merger. The diversion ratio, along with the profit margins of the parties, are the key inputs into calculating the Gross Upward Pricing Pressure Index (GUPPI), which measures the incentive of two producers of differentiated products to raise prices following a merger.[27]

The sources from which information to calculate these metrics are typically drawn include win-loss bidding files maintained by the merging parties, and other ordinary-course documents that identify customers won and lost among incumbent firms. However, these historical records will not show customers won and lost with the potential new entrant, so there may be no basis to compute or estimate cross-price elasticities and diversion ratios. Because the merging parties do not currently compete, there is no substitution to be measured between their respective products.

Customer surveys are sometimes used in the absence of data on customer switching patterns to estimate diversion ratios. However, such surveys are not entirely reliable to the extent that the competing product to which the merging incumbent's customers would be asked to switch does not yet exist, and thus customers may not yet know whether substitution is even feasible. While no customer survey evidence was introduced during the *Steris-Synergy* preliminary injunction hearing, customer staements made to the FTC discussed customers' willingness to switch to Synergy's X-ray sterilization from gamma sterilization. However, as discussed above, these statements would need to be weighed against Synergy's inability to get customers to commit to a baseload volume of X-ray sterilization at its proposed new facilities.

As *Steris-Synergy* illustrates, estimating diversion ratios and GUPPIs in potential competition cases requires heavy reliance on other types of qualitative and quantitative information from the potential entrant's business plan for entry or the merging incumbent's ordinary-course documents that discuss the potential impact of such entry.[28] Such information typically falls into the following categories:

- estimates of current and future market size;
- extent to which the entrant can generate sales from expanding the market as opposed to capturing business from existing incumbent firms;
- timing and scale of entry by the potential entrant and possible future expansion of output;
- other characteristics of the entry decision, such as location of possible production facilities and pricing;
- baseline churn[29] experienced by the merging incumbent; and
- projected margin(s) of the potential entrant.

This information may be sensitive to the assumptions on which it rests, rendering it necessary to evaluate a range of entry scenarios and potential competitive effects. This is especially true if entry involves a limited rollout of some kind where future expansion decisions (e.g., development of subsequent production facilities), depends on success of early production facilities. Synergy's limited initial rollout of two (of five proposed) X-ray sterilization facilities (in two geographic locations) suggests this would have been a factor in assessing the likely competitive effects of its merger with Steris.

In potential competition cases involving the introduction of a new product or technology, as in *Steris-Synergy*, consideration should also be given to (1) whether the potential entrant is uniquely situated to bring this technology to market; (2) whether other firms could enter with the same technology; and (3) whether existing nonmerging incumbent firms could expand production to offer the new technology in response to a postmerger price increase, and thus offset any adverse competitive effects.

The FTC took the position that Synergy was uniquely situated to enter the U.S. market with X-ray sterilization and that no other existing firm was similarly positioned to offer this service at the same scope and in the same time frame. In particular, the FTC pointed to the fact that Synergy had signed an exclusivity agreement with a provider (IBA) of large-scale X-ray sterilization equipment and had already made progress in executing its business plan. However, the merging parties asserted that, at the time of the FTC's complaint, no company, including Synergy, had an exclusive agreement with IBA for X-ray sterilization technology, making this large-scale provider of X-ray sterilization technology available to partner with any firm wanting to pursue new entry. In their view, if Synergy had indeed succeeded with X-ray sterilization as alleged by the FTC, other potential entrants, such as existing contract E-beam sterilization providers, could have entered readily as well. This type of entry might have been aided by the ability of these firms to convert E-beam sterilization machines into X-ray sterilization machines.[30]

Conclusion

The FTC's failed challenge to the Steris-Synergy merger highlights the difficulties in litigating potential competition mergers. The court in the preliminary injunction hearing decided to focus on the question of whether entry would have occurred in the but-for world as a threshold issue. This approach suggests that the enforcement agencies will need convincing evidence on this point before a court will consider evidence of the likely effects of such entry on future competition. This may be true even where, as in the *Steris-Synergy* case, the potential entrant's ordinary course documents suggest that new entry may result in lower prices or other procompetitive effects. Whether such predictions by the potential entrant are based on valid assumptions will be an important consideration for enforcement agencies to weigh before challenging a potential competition merger. While establishing the likelihood of entry is typically more of a factual issue, economic analysis has an important role to play in validating the assumptions underlying the potential entrant's business plan, particularly assumptions relating to pricing, customer demand, and competitive responses from incumbents.

Enforcement agencies may also need to prove that the potential entrant is uniquely situated to enter. Such proof may be easier to establish in some settings than others, based on the observability of characteristics that increase the likelihood of entry. For example, in merger cases involving products that require regulatory approval for entry (such as pharmaceuticals), a potential competitor might be deemed to be uniquely situated to enter the market if no other firms are sufficiently far along in the regulatory process to have the ability to enter within a reasonable time frame. This might explain why most of the recent challenges brought by the enforcement agencies relating to potential competition matters involved pharmaceutical firms.

Even for a potential competition merger in a relevant market that does not yet exist (the so-called potential-potential competition cases), evidence may be needed to show that no other firms apart from the merging parties could realistically enter the new market with the same scope and in the same time frame. For example, in the Nielsen-Arbitron merger, customers of Nielsen and Arbitron (and the majority of voting FTC Commissioners) believed this to be the case, particularly because both parties were already independently developing their own cross-platform measurement services.[31] The visibility of enforcement agencies into the readiness of alternate potential entrants is often more limited, giving the merging parties greater leeway to show that other firms may pursue entry.

The court's decision in the *Steris-Synergy* case also suggests that a potential entrant's business plan may be insufficient to

show that the firm is uniquely positioned for successful entry, even if the firm has made some progress toward entry. These difficulties suggest that potential competition merger challenges are more likely to arise where regulatory or other factors afford greater observability of the pipeline of potential entrants, as in pharmaceuticals.

Economic analysis of potential competition mergers requires careful consideration of factual assumptions underlying the key inputs to merger review, including construction of the but-for world, market definition, and unilateral or other competitive effects, and careful account of key differences that such mergers present in applying the normal tools of economic analysis to evaluate these issues. ■

[1] Nielsen Holdings N.V. & Arbitron Inc., FTC File. No. 131-0058, at 2 (Sept. 20, 2013) (dissenting statement of Joshua Wright, Comm'r, FTC).

[2] In particular, the FTC was concerned about contract radiation sterilization services: E-beam, gamma, and future Synergy X-ray. *See* Plaintiff FTC's Complaint for Temporary Restraining Order and Preliminary Injunction, FTC v. Steris Corp. & Synergy Health plc, Docket No. 1:15-cv-01080, ¶ 30 (N.D. Ohio May 29, 2015) [hereinafter FTC *Steris* PI Complaint]). E-beam sterilization involves exposing a product or foodstuff to an accelerated stream of electron beams, while gamma sterilization involves exposing a product or foodstuff to a radiative isotope, specifically cobalt 60. By comparison, X-ray sterilization involves exposing a product or foodstuff to electron beams passed through an X-ray tube and converted to photons.

[3] *See* Order Denying FTC's Motion for a Temporary Restraining Order and Preliminary Injunction, FTC v. Steris Corp. & Synergy Health plc, Docket No. 1:15-cv-1080, at 6–7 (N.D. Ohio Sept. 24, 2015) [hereinafter *Steris* PI Order]).

[4] *See* U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines §§ 9.1–9.3, at 29 (2010) [hereinafter Horizontal Merger Guidelines], https://www.justice.gov/atr/merger-enforcement (described as the "timeliness, likelihood, and sufficiency" of entry).

[5] *See id.* § 9, at 27–28.

[6] *See* FTC Steris PI Complaint, *supra* note 2, ¶ 36; *see also* Transcript of Preliminary Injunction, FTC v. Steris Corp. & Synergy Health plc, Docket No. 1:15-cv-01080, at 46:6-17 (N.D. Ohio Aug. 17, 2015 [hereinafter *Steris* PI Hearing Transcript, Day One]; Transcript of Preliminary Injunction Hearing, FTC v. Steris Corp. & Synergy Health plc, Docket No. 1:15-cv-01080, at 368:21–369:10 (N.D. Ohio Aug. 18, 2015 [hereinafter *Steris* PI Hearing Transcript, Day Two].

[7] *See* FTC *Steris* PI Complaint, *supra* note 2, ¶¶ 47, 106, 120.

[8] To model the impact of such possible supply shortages on existing prices (and the prices that Synergy could charge), the economic analysis would need to (1) examine the timing of these supply shortages relative to the timing of entry; (2) establish the amount of higher production costs that incumbent firms like Steris would pass on to their customers (and whether the amount passed on might differ based on the expectations regarding future competition from Synergy), and (3) resolve whether such supply shortages would actually materialize. No such analysis was put forth by the FTC or the merging parties as part of the preliminary injunction hearing.

[9] *See Steris* PI Hearing Transcript, Day Two, *supra* note 6, at 305:19–307:18.

[10] Customers requiring sterilization of certain (class II and class III) medical devices must obtain regulatory approval from the Food & Drug Administration for the customers' chosen sterilization method to certify that the sterilization method can meet the proper level of sterility to ensure no harm to a patient. Furthermore, these customers are required to certify the selected sterilization method at each and every facility where its medical devices would be certified using the selected sterilization method. *See Steris* PI Hearing Transcript, Day Two, *supra* note 6, at 517:13–518:8; *see also Steris* PI Hearing Transcript, Day One, *supra* note 6, at 77:9-21.

[11] *See Steris* PI Order, *supra* note 3, at 31–32; *see also Steris* PI Hearing Transcript, Day One, *supra* note 6, at 63:24–64:25.

[12] *See Steris* PI Order, *supra* note 3, at 31–32; *see also Steris* PI Hearing Transcript, Day One, *supra* note 6, at 43:4-21, 77:921.

[13] *See Steris* PI Order, *supra* note 3, at 17, 27–37 ("The evidence shows that all the other numbers upon which the business model was based were the product of guesswork and assumptions.").

[14] The focus of this discussion is on defining the relevant product market. There may also be geographic market considerations that must be taken into account in potential competition cases, particularly in instances where the potential entrant's geographic scope of entry may limit its ability to effectively compete for all of the incumbents' customers. Geographic market considerations will also be relevant to calculating the merging parties' pre- and postmerger market shares and the change in concentration resulting from the merger.

[15] In other words, there are no data with which one can perform the typical SSNIP test. *See* Horizontal Merger Guidelines, *supra* note 4, § 4.1, at 8–13.

[16] *See* FTC Steris PI Complaint, *supra* note 2, ¶¶ 4, 7, 38, 41, 44, 51.

[17] *See id.* ¶¶ 4, 32–36, 43 (describing the various features of gamma sterilization and X-ray sterilization).

[18] FTC *Steris* PI Complaint, *supra* note 2, ¶¶ 34–38.

[19] *See* Answer of Defendant Synergy Health plc's Response, FTC v. Steris Corp. & Synergy Health plc, Docket No. 1:15-cv-1080, ¶¶ 3, 4, 7 (N.D. Ohio June 12, 2015 [hereinafter Synergy's Response to FTC Complaint]); *see also* Defendant Steris Corp.'s Answer to Plaintiff FTC's Complaint, FTC v. Steris Corp. & Synergy Health plc, Docket No. 1:15-cv-1080, ¶¶ 3, 4, 7, 36 (N.D. Ohio June 12, 2015 [hereinafter Steris's Response to FTC Complaint].).

[20] *See* Steris's Response to FTC Complaint, *supra* note 19, ¶¶ 41, 68.

[21] *See Steris* PI Hearing Transcript, Day Two, *supra* note 6, at 290:10–291:6; 367:10–368:17, 385:11–388:4.

[22] *See Steris* PI Order, *supra* note 3, at 28–31 ("[D]espite the level of interest expressed by a handful of healthcare products manufacturers in x-ray technology, Synergy could not identify a single customer who would provide the financial commitment required to build x-ray sterilization facilities in the United States.").

[23] *See* PI Hearing Transcript, Day Two, *supra* note 6, at 299:13-24, 316:6–317:19; *see also* Transcript of Preliminary Injunction Hearing, FTC v. Steris Corp. & Synergy Health plc, Docket No. 1:15-cv-1080, at 596:24–598:17 (N.D. Ohio Aug. 19, 2015 [hereinafter *Steris* PI Hearing Transcript, Day Three].).

[24] *See* FTC *Steris* PI Complaint, *supra* note 2, ¶¶ 109–110.

[25] *See* Horizontal Merger Guidelines, *supra* note 4, § 2.1.3, at 3; *see also* Carl Shapiro, *The 2010 Horizontal Merger Guidelines: From Hedgehog to Fox in Forty Years*, ANTITRUST L.J. 701 (2010); Deborah A. Garza, *Market Definition, the New Horizontal Merger Guidelines, and the Long March Away from Structural Presumptions*, ANTITRUST SOURCE (Oct. 2010), http://www.americanbar.org/content/dam/aba/publishing/antitrust_source/Oct10_Garza10_21f.authcheckdam.pdf.

[26] *See* FTC *Steris* PI Complaint, *supra* note 2, ¶ 110.

[27] See Horizontal Merger Guidelines, *supra* note 4, § 6.1, at 20–22 .

[28] *See* Carl Shapiro, *Mergers with Differentiated Products*, ANTITRUST, Spring 1996, at 23.

[29] Churn reflects customer attrition as measured by the number of customers and/or the volume (units or dollars) of sales that are lost by one firm to other firms.

[30] *See Steris* PI Hearing Transcript, Day Two, *supra* note 6, at 424:15–425:25.

[31] Statement of the FTC, Nielsen Holdings N.V. & Arbitron Inc., FTC File. No. 131-0058 (Sept. 20, 2013).