Second-Generation Monopolization: Parallel Exclusion in Derivatives Markets

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Recommended Citation
Colum. Bus. L. Rev. (forthcoming)
SECOND-GENERATION MONOPOLIZATION:
PARALLEL EXCLUSION IN DERIVATIVES MARKETS

FELIX B. CHANG †

The reluctance of antitrust to condemn parallel exclusion permits oligopolies to be entrenched. This is because parallel exclusion—multiple-firm conduct that inhibits market entrants—cannot satisfy the current strictures of monopolization, which is understood to prohibit single-firm conduct. Yet this is an outdated way of conceptualizing monopolization. An expansion of monopolization—to cover parallel, non-collusive acts by an oligopoly—is due.

To push the law toward recognizing parallel exclusion, this Article examines concentration in the markets for financial derivatives, which are perennially dominated by the same big banks. Even after losses under first-generation antitrust claims, the dominant derivatives dealers have found ways to retain market power. This Article therefore delves into the market power dynamics that traditional theories have sidestepped.

As a technical exercise, this Article illustrates the relevance of market definition as a paradigm—particularly for illuminating blindspots in financial regulation. As a doctrinal endeavor, this Article buttresses the efforts of other scholars to frame parallel exclusion as a form of monopolization.

† Assistant Professor, University of Cincinnati College of Law. I am indebted to Tim Wu for his insightful comments. Thanks, too, to Tom Arthur, Sarah Jane Hughes, Ryan Scott, Sandra Sperino, Rick Steuer, and Sasha Volokh for their thoughts on earlier versions. This article benefitted greatly from the Next Generation of Antitrust Scholars Conference at NYU and presentations at Emory and Indiana University Maurer law schools. I thank Vince Jabour for research assistance. All errors are mine.
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I. INTRODUCTION

Imagine if the country’s four largest airlines controlled the primary airport serving the city of Los Angeles (“LAX”). Such an arrangement likely strikes us as unseemly, though the degree of our discomfort might depend on several factors. Antitrust gives shape to our premonitions by categorizing the harms of enabling airlines to control airports, while devising a schema for when to intervene. For instance, collusion among the large airlines to shut out their competitors would violate Section 1 of the Sherman Act, while the purchase of LAX by the world’s largest airline may run afoul of Section 2.5

However, if the four large airlines merely sat on a committee that oversees LAX’s safety standards and advocated blocking rival airlines on safety grounds, an antitrust case would be much harder—even if, year after year, the same four airlines dominate commercial flights serving Los Angeles. Without explicit agreement or single-firm conduct, in the netherworld between Sections 1 and 2 of the Sherman Act, the law is not inclined to prosecute.

Such is the quandary of parallel exclusion—“conduct, engaged in by multiple firms, that blocks or slows would-be market entrants.”6 Despite robust evidence of anticompetitive, self-entrenching conduct by oligopolies,7 the law remains stagnant.8 This Article is an effort to move the law. The Article presents concentration in the financial derivatives markets as proof of parallel

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2 E.g., how much of the market do the four airlines control, how much of the city’s traffic runs through LAX, and how exactly do the airlines “control” LAX.
3 E.g., leveraging, foreclosure, and exclusion. See Patrick Rey & Jean Tirole, A Primer on Foreclosure 11, in HANDBOOK OF INDUSTRIAL ORGANIZATION III (Mark Armstrong & Rob Porter eds., 2006); Jonathan B. Baker, Exclusion as a Core Competition Concern, 78 ANTITRUST L.J. 527, n1 (2013).
5 Id. § 2. This is especially true if the purchasing airline commands the vast majority of its relevant market.
7 See id. at 1191-95, 1202-04 (analyzing parallel exclusion in the credit card, piping, shipping, and tobacco industries, among others).
8 See infra Section II.A.
exclusion and couches the ensuing harms within the rubric of monopolization.9

While the air traffic illustration above is hypothetical, two gargantuan markets in financial services are converging today in similar fashion. They are the derivatives trading market, where derivatives instruments are bought and sold,10 and the derivatives clearing market, where derivatives trades are processed by financial intermediaries known as clearinghouses.11 Clearinghouses perform “back office” functions such as clearing, settling, and guaranteeing trades.12 Since 2010, financial reform laws have required most derivatives trades to run through these intermediaries.13 Characterized by strong economies of scale, clearinghouses are natural monopolies that financial regulations have rendered indispensable to trading.14

Yet clearinghouses are also member-driven entities whose members happen to be the dominant players in the adjacent trading (or dealer) market.15 Invariably, these dominant dealers are the largest financial institutions in the world, big banks which have become household names since the financial crisis.16 Like airports and airlines, the post-crisis derivatives landscape is one of a bottleneck facility through which an adjacent market’s activity must pass.

Derivatives markets comprise a compelling example of parallel exclusion and its harms for several reasons. First, these markets, especially for over-the-counter (“OTC”) derivatives,17 are

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9 Derivatives are financial instruments whose values fluctuate on the basis of other variables, such as interest rates, stock prices, and whether an unaffiliated party might default on a loan. See Arthur E. Wilmarth, Jr., The Transformation of the U.S. Financial Services Industry, 1975-2000: Competition, Consolidation, and Increased Risks, 2002 U. ILL. L. REV. 215, 337-73 (2002).


12 Id. See also infra Section III.A.1.


15 Id. at 84-87.

16 See infra Section III.B.

17 Derivatives can be divided into exchange-traded and over-the-counter: the first category is traded on open markets such as futures and options
perpetually captured by the same four or five players, all adept at preserving the oligopoly despite market and regulatory changes. For instance, after centralized clearing was mandated for credit default swaps, the top dealers conspired to funnel trades into the clearinghouse that they controlled and then denying rivals access to the clearinghouse. Even after settling a class action for, among other claims, collusion and monopolization, these dealers have not surrendered market shares. The traditional antitrust frameworks of collusion and monopolization, therefore, have proven insufficient to deter the oligopoly.

Second, the coalescence of the clearing and dealer markets demonstrates the ties between parallel exclusion and monopolization. Critics of this linkage between clearinghouses and dealers point to anticompetitive effects such as foreclosure and leveraging, whereby a monopolist’s control of a bottleneck facility enables the monopolist to exclude rivals from the more lucrative downstream market. Traditionally, foreclosure and leveraging were seen as monopolization offenses. Yet tradition also has it that monopolization can only be attributed to one dominant firm. In

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20 See infra Section II.B.
23 See Baker, supra note 3, at 533 (noting that exclusionary claims are most commonly framed as challenges to vertical agreements or monopolization).
24 See Hemphill & Wu, supra note 6, at 1187.
their seminal article *Parallel Exclusion*, Professors Scott Hemphill and Tim Wu propose a “shared monopoly” theory, whereby Section 2 of the Sherman Act is stretched to encompass monopolization by multiple firms. The mechanisms of exclusion in the derivatives markets validate this proposal to house parallel exclusion within monopolization.

Third, there are reasons beyond antitrust as to why certain types of parallel exclusion are intolerable. Parallel exclusion in derivatives markets shuts out rivals and injures consumers. Yet parallel exclusion also perpetuates concentration among the major dealers, and concentration is a surefire conduit of systemic risk. This, after all, is the lesson of the financial crisis. Combatting the dominance of incumbent dealers underpins much of the corporate and financial regulation of clearinghouses. In fact, breaking up dealer dominance has been an implicit goal of the Commodity Futures Trading Commission’s rules on derivatives clearing organizations. So far, though, regulatory efforts have failed in this respect.

All in all, parallel exclusion in derivatives markets is likely to constitute a pernicious kind of exclusion—more anticompetitive than efficient, and altogether risky for the financial system. Here the inability of monopolization to check parallel exclusion is an immense blindspot within antitrust, on the order of hundreds of trillions of dollars.

This Article ultimately concludes that the clearing markets do indeed perpetuate concentration in the dealer markets and, hence, exclusion is at play. Yet in some ways, the conclusion is less

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25 See id. at 1236-40.
26 See Section IV infra.
29 CFTC, DCO General Provisions, supra note 28, at 69355; Roe, supra note 27 at 1690.
31 See Hemphill & Wu, supra note 6, at 1213 (“only some fraction of parallel conduct is exclusionary and some fraction of that is both exclusionary and anticompetitive”).
32 On antitrust’s difficulty in dealing with exclusion, see Baker, supra note 3. On the size of the OTC derivatives markets, see infra Section III.A.2, III.B.2.
important than the analysis; by gauging the market power of the dominant players, this Article injects a modicum of precision into the debate over competition in the derivatives markets. A\textsuperscript{33} An assessment of market power is the very first step in a fight over exclusion.\textsuperscript{34} Even before proving that clearinghouses perpetuate dealer dominance, detractors must work through several additional steps, including whether the scheme’s anticompetitive effects outweigh the enhanced efficiencies. In measuring the market power of the key players and then tethering the findings to a cohesive framework, the Article carries out a back-to-basics analysis that has been missing on all sides of the debate.\textsuperscript{35}

Yet market power analysis of the derivatives markets is a difficult endeavor. In antitrust, the proper measure of market power has been fraught with controversy.\textsuperscript{36} The prevailing paradigm—using market share as a proxy for market power—is the target of fierce criticism.\textsuperscript{37} By undertaking a methodical, if traditional, study of market definition and market share in the derivatives world, this Article blends antitrust and financial reform scholarship in a broader way. The Article validates the market definition/market share

33 On the relationship between stability and competition for clearinghouses, compare CFTC Roundtable, supra note 22, at 67 (comments of Roger Liddell, CEO, LCH ClearNet Group), and 71 (comments of Jonathan Short, ICE Trust), with 47 (statement of Jason Kastner Vice Chairman, Swaps and Derivatives Markets Ass’n.).


paradigm by showing its ability to illuminate blindspots in financial regulation.  

The remainder of this Article unfolds as follows: Part II introduces parallel exclusion and the derivatives markets. Part III delves into market power analysis to create a fuller picture of the upstream clearing and downstream dealer markets. Part IV examines the harms of parallel exclusion in the derivatives markets, and Part V takes up the benefits.

II. PARALLEL EXCLUSION AND THE DERIVATIVES MARKETS

Scholars have long recognized the difficulty of antitrust to coherently deal with exclusion. Broadly construed, exclusion is a practice designed to “discipline or exclude rivals so that the [perpetrator] can attain or maintain monopoly power.” Such practices include monopolization, attempt to monopolize, predatory pricing, tying, and some forms of vertical integration. In doctrine, exclusion typically surfaces as a violation of Section 2 of the Sherman Act. In practice, exclusion often implicates two markets, whereby one market is manipulated to foster the perpetrator’s dominance over an adjacent market. Such is the arrangement that this Article explores: four airlines controlling an airport to protect the airlines’ dominance over commercial flights, or five derivatives dealers controlling a derivatives clearinghouse to protect their dominance over the trading market.

While there has been a sea change to bring exclusionary concerns to the forefront of competition policy, the impulse to

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38 See infra Section III.B.2.
39 In upstream (wholesale) markets, firms sell to other firms; in downstream (retail) markets, firms sell products to end-users. See OECD, DEFINING THE RELEVANT MARKET IN TELECOMMUNICATIONS 14 (2014). For this Article’s purposes, the clearing market is upstream; the trading (or dealer) market is downstream.
40 See, e.g., Baker, supra note 3, at 527. The difficulty can be attributed in part to the decades-long dominance of the Chicago School, which has been skeptical of the place of exclusion within antitrust. See id. at 528.
41 HOVENKAMP, supra note 34, at 715.
42 Id.
43 See Baker, supra note 3, at 533-34 (discussing the nuances of this association).
45 Leaders in this effort include the Post-Chicago School and the Nobel Prize-winning economist Jean Tirole. For excellent summaries, see Steven C. Salop, Economic Analysis of Exclusionary Vertical Conduct: Where Chicago Has
cabin exclusion within Section 2 of the Sherman Act lingers on.\(^{46}\) This tendency confines the prosecution of exclusion to acts by a single perpetrator.\(^{47}\) Recently, Hemphill and Wu’s work has illuminated the gray area where multiple actors are engaging in parallel exclusive behavior without express agreement. For the most part, courts have declined to recognize parallel exclusion.\(^{48}\) Here antitrust would doubtlessly benefit from a sustained study of one industry over time, where an oligopoly has engaged in recidivist exclusion, moving from one scheme of to another to maintain market power.

To that end, this Section serves as a primer on two fronts. First, this Section discusses Hemphill and Wu’s work on parallel exclusion, noting in particular the subsequent reception of this theory. Next, this Section introduces the derivatives markets, which shall function as corroboration of parallel exclusion and its harms.

### A. Parallel Exclusion

Parallel exclusion is “self-entrenching conduct, engaged in by multiple firms, that harms competition by limiting the competitive prospects of an existing or potential rival to the excluding firms.”\(^{49}\) Notably, the phenomenon occurs in the absence of explicit agreement,\(^{50}\) which makes it hard to fit parallel exclusion to antitrust’s current framework. Without express agreement, anticompetitive behavior by multiple actors does not constitute collusion;\(^{51}\) simultaneously, the behavior cannot satisfy monopolization, since there is more than one actor.\(^{52}\)

While not all parallel conduct is anticompetitive or exclusive, the pernicious strain of parallel exclusion does satisfy both thresholds.\(^{53}\) For instance, it is common practice for firms to mimic a successful product or follow a fashion trend; this would not exclude

\(^{46}\) See supra note 43.

\(^{47}\) See Hemphill & Wu, supra note 6, at 1188, 1236.

\(^{48}\) See infra Section II.A.

\(^{49}\) Hemphill & Wu, supra note 6, at 1189.

\(^{50}\) Id. at 1190.


\(^{53}\) More precisely, parallel exclusion must, at a minimum, be anticompetitive to be condemned. See Hemphill & Wu, supra note 6, at 1186 (“we do not insist that all parallel exclusion is anticompetitive, nor do we think that most parallel conduct is exclusionary”).
other market players or hurt competition. On the other hand, four major airlines sitting on a committee that oversees safety standards for LAX and independently advocating for rigorous safety standards may indeed exclude the operators of shoddily maintained aircrafts.

Even within the realm of parallel exclusion, not all practices are on balance harmful. In the example above, high standards might lock out some competitors of the four airlines from LAX, but reducing the number of airlines can simplify the airport’s operations. Additionally, safety concerns would more than offset the anticompetitive effects. Hence, to separate detrimental and benign parallel exclusion, Hemphill and Wu propose an approach that requires (i) sufficient monopoly power, (ii) anticompetitive effects, and (iii) lack of efficiency justifications.

This weighing, of anticompetitive effects and enhanced efficiencies, echoes antitrust’s treatment of exclusion generally. For example, antitrust has traditionally condemned the exclusionary effects of vertical integration only where (i) the firm or firms involved have substantial market power, (ii) integration results in significant foreclosure of a vertically related market, and (iii) the case for enhanced efficiencies is very weak. In fact, exclusion, vertical integration, and monopolization are often conflated and subsumed within a larger Section 2 analysis. Hemphill and Wu’s decision to house parallel exclusion within Section 2 must therefore contend with all its doctrinal baggage. Most prominently, Section 2 is usually understood to prohibit only single-firm behavior. Hemphill and Wu surmount this obstacle by exploring, among other paths, the “shared monopoly” theory of monopolization, which would harmonize treatment of parallel exclusionary practices by both single and multiple firms.

The “shared monopoly” theory, too, must overcome its set of obstacles, chief among them the Supreme Court’s reluctance to extend Section 2 to multiple defendants acting independently. Such precedents include Bell Atlantic Corp. v. Twombly, where the Court required more than a showing of parallel conduct or independence to move a Section 1 claim past pleading, and Brooke Group Ltd. v. Brown & Williamson Tobacco Corp., where the Court cast doubt on whether oligopolistic price coordination or conscious parallelism

54 Id. at 1214-15.
55 Id. at 1137-38. Note that this is one of two broad approaches—shared monopoly (falling under Section 2) and aggregation of contracts (falling under Section 1).
56 Hovenkamp, supra note 34, at 422. See also id. at 298.
58 Hemphill & Wu, supra note 6, at 1137-38.
59 See 550 U.S. at 553-56.
would injure consumers to the same extent as predatory pricing by a monopoly. Even if *Twombly* and *Brooke Group* are read narrowly—and Hemphill and Wu do so—in recent cases where parallel conduct was the basis for a Sherman Act claim, parallel exclusion has enjoyed mixed reception at best.

In *In re Credit Default Swaps Antitrust Litigation*, a consolidated class action against the major players in the trading of credit default swaps (“CDS”), the plaintiffs alleged that the defendants had illegally cornered the market. The causes of action included conspiring to fix the bid/ask spreads of dealers in violation of Section 1 of the Sherman Act and conspiring to block the emergence of alternate trading and clearing platforms in violation of Section 2. Conscious of the vulnerability of a shared monopoly theory, the plaintiffs staked their Section 2 claim on conspiracy to monopolize. Conspiracy to monopolize is narrower than shared monopoly but rests upon surer footing. Nonetheless, the Southern District of New York explained this “spread” as follows:

> Market makers—also referred to as “dealers”—sell to buyers, buy from sellers, and hold inventory until a match emerges. In other words, dealers (the “sell-side” of the market) sell CDS investors (the “buy-side” of the market) liquidity: the ability to trade without having to wait for a counterparty. A dealer offers a “bid” price at which the dealer will purchase and an “ask” price at which the dealer will sell. By keeping their bid lower than their ask, dealers can capture the difference, known as the “bid/ask spread.”

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60 See 509 U.S. at 227-29. Oligopolistic price coordination or conscious parallelism are practices “by which firms in a concentrated market might in effect share monopoly power, setting their prices at a profit-maximizing, supracompetitive level.” *Id.* at 227.

61 Hemphill & Wu, *supra* note 6, at 1199, 1240-41 (casting *Twombly* as a case about parallel action in the collusion or pricing context, rather than exclusion), n.246 (casting *Brooke Group* as a case about parallel pricing rather than parallel exclusion).


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64 *CDS Antitrust Litig.* Order, *supra* note 18, at 1.


66 Shared monopoly encompasses both independent and interdependent exclusion, while conspiracy to monopolize covers only the latter. See Hemphill & Wu, *supra* note 6, at 1136-36.

District of New York permitted the Section 1 claim to proceed but dismissed the Section 2 claim. The court noted that precedent thwarted the shared monopoly theory; as for conspiracy to monopolize, the court signaled—grudgingly—that it would relent only if the defendants were alleged to have conspired to form a single entity to harness monopoly power.

On the heels of In re CDS Antitrust Litig., the Fourth Circuit reversed a district court’s dismissal of a group boycott claim against several table saw manufacturers. In SD3, LLC v. Black & Decker (U.S.) Inc., the plaintiff invented and sought to commercialize technology to mitigate table saw injuries, but the defendants allegedly colluded to develop safety standards that imposed unnecessary costs on the plaintiff and prevented adoption of its device. The court found that the plaintiff had adequately pled parallel conduct and even cited to Parallel Exclusion as support for the “classically anticompetitive” effect of defendants’ conduct. However, only Section 1 was at issue, not Section 2. SD3 therefore adds no new law on monopolization.

As of now, no recent case has moved toward recognizing parallel exclusion as a form of monopolization. This stagnancy in the law bodes particularly poorly after In re CDS Antitrust Litig., a case this Article will return to several more times, because of the court’s gravitas in finance-related litigation. As the remainder of the

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68 Id. at 18.
69 Id. at 11-12.
71 See id. at 427.
72 Arguably, SD3 is a boycott case that falls into the “easier” camp within parallel exclusion, where explicit agreement can be traced and the oligopoly’s stability is easy to achieve. See Hemphill & Wu, supra note 6, at 1189-90.
73 Outside the Fourth Circuit and the Southern District of New York, the plaintiffs in a Third Circuit case have noted the following in its attempt to combine the defendants’ market shares under Section 2:

The economic reality is that the harm caused by Defendants’ collective bundling practices does not hinge on the presence or absence of agreement: the anticompetitive outcome is the same with or without a conspiracy. While some courts have declined to adopt this view, the Third Circuit has never addressed it.

Article argues, an outdated conception of Section 2 permits dominant players in the derivatives markets to exclude rivals while steering clear of Section 1’s prescriptions, with profound consequences for competition, consumer welfare, and the health of the financial system.

B. The Derivatives Markets

Nowhere is concentration in the derivatives industry more apparent than the CDS trading market, whose evolution exhibits a pattern of recidivist exclusion by the dominant dealers. Due to the high degree of customization and low degree of liquidity that characterize trading, a few dealers—large commercial and investment banks—emerged early on as the dominant market-makers. At first, these dealers were the only institutions capable of managing the peculiar risks of the market, and they profited handsomely for it. Trading revenues for credit derivatives have hovered around 10% of trading revenues for all derivatives ($530 million per quarter, out of $5.517 billion), even though credit derivatives comprise only 4.3% of all derivatives.

With time, however, innovations sprang up to reduce the market’s imperfections—and thereby erode the dealers’ margins. Trading volumes increased, and the instruments became more standardized, which in turn exerted pressure upon the market to become more transparent. All along, opacity had permitted the large dealers to mark up their bid/ask spreads, so these changes threatened their supracompetitive pricing.

74 See CDS Antitrust Litig. Order, supra note 18, at 1-2.
75 In the most recent quarter for which data was available, trading in credit derivatives generated $530 million for banks. See Office of the Comptroller of the Currency, OCC’s Q. Rep. on Bank Trading & Derivatives Activities: Second Q. 2015, 1-2 [hereinafter OCC, 2015 Q2 REPORT]. Earnings from CDS trading have historically swung wildly, from maximum quarterly earnings of $2.727 billion (out of $10.217 billion for trading in all derivatives) to maximum quarterly losses of $10.237 billion (out of $10.580 billion for all derivatives). See id. at 2.
76 Standardization came about because ISDA introduced a Master Agreement to document derivatives trades and also because CDS indices, which aggregate data for a group of referenced entities, emerged. See CDS Antitrust Litig. Order, supra note 18, at 2. See also Kathryn Judge, Intermediary Influence, 82 U. Chi. L. Rev. 573, 611-12 (2015).
The large dealers responded by capturing the intermediaries and standard-setting bodies that were ushering in these changes. First, the dealers limited the dissemination of CDS pricing information. They were able to do so because their representatives sat on the board of the Depository Trust & Clearing Corporation ("DTCC"), a financial services company which compiles real-time post-trade data. DTCC managed to secure from Markit, a company which circulates DTCC’s data, an agreement to delay dissemination of CDS pricing information to Markit’s subscribers. Markit was a named defendant in the case, and the large dealers also happened to hold ownership interests in it as well. This agreement was contrary to Markit’s own self-interest, of course, since its pool of subscribers was broader than the defendant-dealers, but sacrificing short-term economic self-interest can help to elevate independent parallel behavior to conspiracy.

Later, when an electronic platform emerged to trade CDS, the dealers undermined the venture by collectively directing all their trades to ICE Clear Credit, a clearinghouse in which the dealers held ownership interests and whose risk committee the dealers controlled. It was a creative scheme of exclusion, leverage, and foreclosure: Dodd-Frank required CDS trades to be centrally cleared; an alternative trading platform had been built by a joint venture which operated its own clearinghouse; the dealers commanded the lion’s share of CDS trading and routed traffic toward their clearinghouse; without this traffic, the upstart clearinghouse could never attain high volumes, and the closely linked exchange could never get off the ground. To bolster this effort, the dealers

79 Id. at 3. See also Global Trade Repository (GTR), DTCC, http://dtcc.com/derivatives-services/global-trade-repository (last accessed Feb. 9, 2016).
82 CDS Antitrust Litig. Order, supra note 18, at 4-5.
83 Dodd-Frank §§ 723, 763.
85 On how this strategy has been deployed elsewhere, see U.S DEP'T OF JUSTICE, TREAS-DO-2007-0018, REVIEW OF THE REGULATORY STRUCTURE ASSOCIATED WITH FINANCIAL INSTITUTIONS (2008).
allegedly convinced Markit and the International Swaps and Derivatives Association (“ISDA”), a trade group which created documentation for derivatives trading, to forego granting licenses to the upstart trading platform.\textsuperscript{86} Not surprisingly, the venture folded almost as soon as it started.\textsuperscript{87}

For all its intricacies, \textit{In re CDS Antitrust Litig.} was a straightforward case. The defendant-dealers had held secret meetings to coordinate amongst each other and with DTCC, ISDA, and Markit in violation of Section 1 of the Sherman Act. Horizontal conspiracies such as these have always enjoyed primacy in the antitrust hierarchy.\textsuperscript{88} Given the choice, plaintiffs always plead collusion over exclusion.\textsuperscript{89} Hence, the case would settle—for $1.87 billion—one year after the Southern District of New York allowed the Section 1 and ancillary claims (but not the Section 2 claim) to go forward.\textsuperscript{90}

Yet this Article is interested in the much harder scenario of what happens afterward. So far, the CDS dealer market has not loosened up. Large dealers continue to sit on the risk committee of ICE Clear Credit, whose membership roster has not expanded.\textsuperscript{91} We are also not likely to see the type of explosive evidence of conspiracy that came to light, without which this case would have failed.\textsuperscript{92} The stasis in the market despite the settlement is all the more intriguing because it hews closely to the reality that parallel action is frequently the only thing that plaintiffs can point toward. Evidence of horizontal

\textsuperscript{86} See \textit{CDS Antitrust Litig.} Order, supra note 18, at 4-5. The dealers also sat on the boards of Markit and ISDA. Id.


\textsuperscript{89} In fact, the class action complaint in \textit{CDS Antitrust Litig.} was peppered with references to collusion. See generally \textit{CDS Antitrust Litig.} Complaint, supra note 62.


\textsuperscript{91} See infra Section III.B.

\textsuperscript{92} See \textit{CDS Antitrust Litig.} Order, supra note 18, at 6 ("Plaintiffs could not have discovered through the exercise of reasonable diligence that they were injured until December 2010, when the existence of secret meetings was first uncovered by the New York Times.") (citing Story, supra note 87). This is especially true in the aftermath of \textit{Twombly}. For the defendants’ \textit{Twombly} challenges to the sufficiency of the plaintiffs’ pleadings, see Dealer-Def.’s Mem. in Supp. of their Joint Mot. to Dismiss, \textit{In re Credit Default Swaps Antitrust Litig.}, No. 1:13-md-02476, 2014 WL 996473 (S.D.N.Y. 2014) [hereinafter \textit{CDS Antitrust Litig.} Dealer Joint Mot.].
conspiracy, the easier Section 1 claim, is simply too difficult to gather. And if the dominant dealers divest ownership in the clearinghouses or own only a minor interest,\textsuperscript{93} the more established Section 2 claim of vertical integration is not available. In \textit{In re CDS Antitrust Litig.}, the defendants repeatedly pounced on the dubious status of shared monopoly and parallel conduct in antitrust.\textsuperscript{94} It was a view that the Southern District of New York ascribed to. In dismissing the Section 2 claim, the court appeared to endorse conspiracy to monopolize only under very narrow circumstances—where the plaintiffs allege that the defendants conspired to either form a single entity to possess monopoly power or seek to allocate a market.\textsuperscript{95} Under these first-generation proscriptions of monopolization, antitrust law cannot catch up to economic realities. Thus, to nudge antitrust toward a more expansive, second-generation vision of monopolization, the rest of this Article shall labor through the mechanics of parallel exclusion in the OTC derivatives markets.

Before moving on, however, this Subsection shall linger on two additional points. First, \textit{In re CDS Antitrust Litig.} should be read as one in a line of cases demonstrating the resilience of the dominant dealers at retaining market power. This includes a 2011 investigation by the European Commission into tactics by the dominant dealers to maintain their stronghold over the CDS market,\textsuperscript{96} as well as private actions by pension funds and investments banks against the large dealers, ISDA, and Markit for illegally cornering the market.\textsuperscript{97}


\textsuperscript{94} \textit{See CDS Antitrust Litig.} Dealer Joint Mot., supra note 92.

\textsuperscript{95} \textit{See CDS Antitrust Litig.} Order, supra note 18, at 13-14 (citing \textit{Arista Records LLC v. Lime Grp. LLC}, 532 F.Supp.2d 556, 580 (S.D.N.Y.2007)).

\textsuperscript{96} European Commission, Press Release, \textit{Antitrust Commission probes Credit Default Swaps market} (Apr. 29, 2011), http://europa.eu/rapid/press-release_IP-11-509_en.htm. Interestingly, the European Commission was investigating whether the dealers’ use of Markit and ICE Clear Europe, the dominant CDS clearinghouse in Europe, constituted “collusion [analogous to Sherman Act Section 1] between them or an abuse of a possible collective dominance [analogous to shared monopoly under Sherman Act Section 2].”

However it is framed,\(^9\) this impulse to exclude has characterized the dominant dealers’ behavior for decades, regardless of whether competitors, consumers, and enforcement agencies had prevailed.\(^9\)

Second, the CDS market might be the poster child of recidivist parallel exclusion, but not all markets behave the same way.\(^10\) Some markets enable dominant firms to realize their dreams of perpetual dominance because certain imperfections (including perverse consequences of regulation) create the opportunities to do so. Other markets are perfectly capable of disciplining these impulses through well-functioning competition. Thus, while this Article looks to the OTC derivatives markets to substantiate parallel exclusion, it is careful to distinguish among the markets for different derivatives and to highlight where the challenges are most pronounced.

### III. Market Power Analysis

If the four major airlines were to control LAX, we would have to pursue three lines of inquiry before condemning the arrangement.\(^10\) First, what is the nature of this “control”? Second, what are its harmful effects? Finally, what are its benefits? The first question determines whether there might be parallel exclusion, which this Section attempts to do for the derivatives markets. The remaining two questions, which will be taken up in Sections IV and V, separate harmful from benign forms of parallel exclusion.

No examination of exclusion is complete without market power analysis of the constituent markets.\(^10\) For OTC derivatives, economies of scale and network effects work in tandem to render the providers of clearing services natural monopolies with significant

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9 That is, whether this is the proclivity of intermediaries to suppress efficiencies, see Judge, supra note 76, or simply inevitable business practices.


100 Thus, it cannot be said that “a market is a market is a market”, any more than “a swap is a swap is a swap.” See Gertrude Stein, Sacred Emily (1913).

101 This Article adopts Hemphill and Wu's three-part approach. See Hemphill & Wu, supra note 6, at 1237-38 (citing United States v. Grinnell Corp., 384 U.S. 563, 570-71 (1966); United States v. Microsoft Corp., 253 F.3d 34, 51 (D.C. Cir. 2001)). This approach is common to other types of anticompetitive exclusion. See, e.g., Hovenkamp, supra note 34, at 422 (vertical integration).

102 See, e.g., U.S. Dept. of Justice, Non-Horizontal Merger Guidelines § 4.2 (1984) (stating, as the first prong of assessing anticompetitive vertical mergers, a finding that the degree of vertical integration is so extensive that entrants to one market would also have to enter the second market simultaneously).
market power. However, the downstream dealer markets are where the real profits lie; these markets are also concentrated, with virtually the same big banks controlling market activity year after year. If the clearing and dealer markets are working together, then there is a danger that the bottlenecks operating at thin margins (clearinghouses) are being deployed to maintain the dominance of the dealers in the adjacent markets.

This Section dissects the intricacies of market power in both upstream and downstream markets to assess the validity of the charge that the clearing markets are the instruments of dealer exclusion.\textsuperscript{103} Section II.A examines the market power of derivatives clearinghouses, focusing in particular on clearinghouses for interest rate swaps (“IRS”) and credit default swaps (“CDS”), two products that, prior to financial reform legislation, had largely been cleared on bilateral bases.\textsuperscript{104} Section II.B examines the market power of derivatives dealers, wading into a longstanding debate over whether this market is concentrated or not. Section II.C examines the mechanisms by which the dominant dealers control the clearinghouses.

In many ways, market power has never been more important. The recent work of economists and legal scholars has produced keen insights into how firms with market power behave.\textsuperscript{105} Simultaneously, however, the traditional measurement of market power—that is, the market definition/market share paradigm—has come under intensifying assault.\textsuperscript{106} Therefore, any discourse on market power must also thoughtfully defend its methodology for assessment. At the risk of hitching itself to a methodology that is slowly growing obsolete, this Article will utilize the market definition/market share paradigm, both because of its lasting

\textsuperscript{103} See, e.g., Chang, supra note 14; Greenberger, supra note 21; Tuberville, supra note 21.

\textsuperscript{104} Before the financial crisis, clearing was performed bilaterally, by the counterparties to a trade. In 2009, the Group of Twenty nations made centralized clearing a centerpiece of financial reform; with that push, both the U.S. and EU now require clearinghouses to be interposed into derivatives trades. See Dodd-Frank § 723, 763; EMIR arts. 1, 14-15.

\textsuperscript{105} See, e.g., ROYAL SWEDISH ACADEMY OF SCIENCES, JEAN TIROLE: MARKET POWER AND REGULATION. See also supra note 45.

influence on the courts\textsuperscript{107} and because of its capacity to uncover subtle trends in the derivatives markets.\textsuperscript{108}

Specifically, the market definition/market share paradigm produces the following observations: (i) Derivatives trading is comprised of distinct geographic markets, the largest being the U.S. and Europe, each dominated by a small oligopoly of approximately five dealers.\textsuperscript{109} These large dealers compete fiercely against each other within the oligopoly, but as a block, they adopt actions that exclude smaller competitors from breaking into the oligopoly. (ii) Derivatives clearing does not necessarily reflect the same geographic fragmentation, since the clearing of IRS is dominated by one producer while the clearing of credit default swaps CDS appears to be dominated by two producers.\textsuperscript{110} (iii) In the U.S. trading market, activity should be tracked at the bank holding company level rather than the commercial bank level.\textsuperscript{111} Doing so broadens the tunnel vision of banking regulators, who tend to focus on lending and ancillary activities.\textsuperscript{112} (iv) Understanding the delineation between commercial bank dealers and investment bank dealers helps to parse the sales strategies of the major dealers—in particular, whether IRS and CDS are being tied to the provision of credit.\textsuperscript{113}

A. The Clearing Markets

1. Network effects and natural monopoly characteristics

The producers in the upstream clearing markets are derivatives clearinghouses, a type of financial market infrastructure (“FMI”) which guarantees the trades of its members.\textsuperscript{114} If a member is unable to fulfill its obligations under a trade, the clearinghouse will

\textsuperscript{107} See, e.g., Christy Sports, LLC v. Deer Valley Resort Co., 555 F.3d 1188, 1198-99 (10th Cir. 2009).

\textsuperscript{108} See infra Section III.A.2, III.B.2.

\textsuperscript{109} See infra notes 209-10 and accompanying text.

\textsuperscript{110} See infra notes 155-56 and 160-61 and accompanying text.

\textsuperscript{111} See infra notes 205-08 and accompanying text.

\textsuperscript{112} See infra notes 200 and 206-08 and accompanying text.

\textsuperscript{113} See infra notes 188-91 and accompanying text.

\textsuperscript{114} On FMIs generally, see Bank for Int’l Settlements & OICU-IOSCO, Principles for Financial Market Infrastructures (2012), archived at http://perma.cc/Z2DB-JPWP; Federal Reserve, Oversight of Key Financial Market Infrastructures (2009), http://www.federalreserve.gov/paymentsystems/over_about.htm. The most well-known FMIs are credit cards such as Visa and payment messaging systems such as SWIFT.
step in. Membership is determined by a complicated set of criteria that abide by certain regulatory constraints.\textsuperscript{115}

By their very design, clearinghouses exhibit strong economies of scale—so strong, in fact, that clearinghouses can be classified as natural monopolies.\textsuperscript{116} A natural monopoly arises when a market is more efficiently serviced by one producer than multiple ones.\textsuperscript{117} Common examples of natural monopoly occur in industries such as utilities and telecommunications, which rely heavily on infrastructures. As infrastructures themselves, FMIs have been observed to be natural monopolies.\textsuperscript{118} For clearinghouses in particular, marginal costs decrease when the intermediary grows, due to its ability to perform two significant functions: *netting* and *compression* of trades.

A clearinghouse can net, or offset, the positions of its members. If, for instance, member A owes member B $1 million on a trade, member B owes member C $1 million on another trade, and member C owes member A $2 million on a third trade, a clearinghouse can net all three trades into one clean result: member C owes member A $1 million. Accordingly, member A and member B may not have to post additional margin, or collateral, on these trades. Overall, the margin that members must post to trade diminishes, since the clearinghouse can tap more positions to offset against one another.\textsuperscript{119}

In addition to netting, clearinghouses also have the ability to compress trades. Trade compression, also known as trade “tear ups,” is the replacement of a large trade with a set of smaller trades.\textsuperscript{120} The fundamental benchmark of a derivatives trade is its notional amount—or the face amount of the contract which acts as the basis for exchange of payments. By way of illustration, if the

\textsuperscript{115} Such constraints include an open access mandate, see 17 C.F.R. 39.12(a)(1) (2015), and limitations on capital requirements for membership, see 17 C.F.R. 39.12(a)(2)(iii) (2015).


\textsuperscript{119} For a nuanced analysis of netting, see Roe, *supra* note 27, at 1660-62.

\textsuperscript{120} ISDA, *Interest Rate Swaps Compression: A Progress Report* 2 (2012).
counterparties to a $5 million (notional) trade have offsetting positions, a clearinghouse can compress the trade by replacing it with a trade whose notional is $1 million.\footnote{Id.} The counterparties benefit because the payments they exchange with one another diminishes—for example, if one counterparty owes the other 20% of the notional, that payment will be $200,000 under the compressed trade ($1 million notional), as opposed to $1 million under the original trade ($5 million notional). Regulators favor compression because it lowers the notionals floating in the derivatives markets, thereby lowering the exposure of trading counterparties.\footnote{See TriOptima, triReduce Portfolio Compression: Optimizing Leverage Ratios and Reducing Risk, http://www.trioptima.com/uploading_images/pdf/triReduce%20EU.pdf (last accessed Oct. 13, 2015).}

Due to the network effects of established clearinghouses, insurgents find it very difficult to penetrate the clearing markets. This pattern has been seen with other FMIs; indeed, the history of payment systems reveals that network effects can quickly propel an early-mover FMI into a dominant one.\footnote{See, e.g., Wolkoff & Werner, supra note 84, at 313–14 (futures clearinghouses): U.S. Dep’t of Justice, Review of the Regulatory Structure Associated with Financial Institutions, Comments before the Dep’t of Treasury 10 (2008) (futures clearinghouses); Nandini Sukumar & Matthew Leising, LCH.Clearnet in Talks to Buy Nasdaq’s Rate Clearinghouse, BLOOMBERG NEWS (Apr. 24, 2012), archived at http://perma.cc/E884-XQPU (IRS clearinghouse); Adam J. Levitin, Priceless? The Economic Costs of Credit Card Merchant Restraints, 55 UCLA L. Rev. 1321, 1327 (2008) (credit cards); Publication of an Undertaking: Case No IV/36.120 – La Poste/SWIFT + GUF, 1997 O.J. (C335) 3, 4 (EC) (SWIFT).} This is because as an established FMI grows, it becomes increasingly cheaper for the FMI to serve existing customers and attract new ones. Marginal cost decreases even as—or, more accurately, because—the network attracts customers.\footnote{See HOVENKAMP, supra note 34, at 32.} This trait is even more pronounced with nontraditional infrastructures such as a clearinghouse; hard infrastructures such as roads and telephone networks face capacity issues,\footnote{See BRETT M. FRISCHMANN, INFRASTRUCTURE: THE SOCIAL VALUE OF SHARED RESOURCES 3-4 (2012).} but FMIs do not tend to become congested. An established clearinghouse can also fend off insurgents because members of the incumbent can trade so cheaply, due to netting and compression.

2. Defining the market

It is axiomatic that market power is a firm’s ability to increase profits by reducing output and charging a supracompétitive
price for its products. 126 Mathematically, market power can be expressed as a relationship between price and marginal cost, where the larger the markup of price over marginal cost, the greater the firm’s market power. 127 Alternatively, market power can be expressed as an inverse relationship with the firm’s elasticity of demand. 128 However, marginal cost and elasticity of demand are notoriously difficult to pin down, so quantifying market power traditionally defaults to the surrogate of (i) defining the relevant market and then (ii) measuring the market share of the scrutinized firms. 129

This Subsection defines the upstream clearing markets for two types of OTC derivatives—IRS 130 and CDS. 131 They are the paradigmatic OTC derivatives, traded in sophisticated markets directly affected by the central clearing mandate. 132 IRS comprise roughly 80% of all OTC derivatives. 133 CDS occupy a smaller share, roughly 4.3%. 134

126 Hovenkamp, supra note 34, at § 3.1.
127 This is the Lerner index: \( L = \frac{P - MC}{P} \), where \( P \) denotes price and \( MC \) marginal cost. See Landes & Posner, supra note 106, at 939; Kaplow, Why (Ever) Define Markets?, supra note 36, at 445-46.
128 \( L = \frac{-1}{E_d} \) where \( E_d \) is the firm’s demand curve.
129 Kaplow, Why (Ever) Define Markets?, supra note 36, at 446-48. Of course, measuring market share is a tricky endeavor. Its predicate step of market definition is prone to ambiguity, and its value as an approximation for market power has come under fire time after time. See supra note 106.
130 IRS are derivatives where the referent asset is the fluctuation of interest rates. For instance, assume that a borrower takes out a loan at a rate of LIBOR plus 3%, at a time when LIBOR is hovering around 2%. LIBOR fluctuates up and down; to manage the volatility, the borrower (whom we’ll call “Buyer”) purchases an IRS from a financial institution (whom we’ll call “Seller”), pursuant to which Buyer pays Seller a fixed interest rate of 5% on Buyer’s loan, and Seller pays Buyer the variable interest rate of LIBOR plus 3%.
131 CDS are derivatives whose referent asset is the potential default on another obligation. Assume that a borrower takes out a loan from a bank. To hedge against the possibility of the borrower’s default, the bank (whom we’ll call “Buyer”) might purchase a CDS from a financial institution (“Seller”), pursuant to which Seller will pay Buyer the face amount of the borrower’s loan in the event that the borrower defaults.
134 Id.
Customarily, market definition unfolds in two parts: the relevant product market and the relevant geographic market. The product market is calibrated to the smallest grouping of sales where the elasticities of demand and supply are low enough that a monopolist controlling the grouping could reduce output and increase price substantially above marginal cost. A similar inquiry is then undertaken to arrive at the relevant geographic market.

Derivatives markets complicate market definition in several ways. First, clearing markets tend toward amalgamation, while the underlying products are at their core unfungible. This tension is one of the fundamental challenges to the central clearing mandate because unfungible products are difficult to clear. Second, there is evidence that the IRS and CDS markets are fragmenting along geographic lines. The implications of these two trends will be discussed in turn.

By nature, clearing markets gravitate toward one naturally monopolistic provider. A dominant clearinghouse of, say, IRS, can harness its network effects to maintain dominance over the market. By contrast, the underlying products—the derivatives themselves—might be highly customized. Derivatives are designed and sold that way; buyers of derivatives for hedging purposes want products tailored to a narrow risk profile, while buyers for speculation purposes want to bet on a narrow set of circumstances. Either way, these transactions are intricately customized and inimitable trades.

The customization of derivatives products is salient not just for the trading market, where these products are sold; the consequences of customization also spill over to the adjacent

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135 See HOVENKAMP, supra note 34, at 92.
136 Id. at 92. Over time, this grouping has acquired the shorthand SSNIP—“small but significant and nontransitory increase in price.” Id. at 93, n.2.
138 See CFTC Roundtable at 49 (statement of Bill Hill, Morgan Stanley) (distinguishing between the clearing of a liquid, easy-to-value single-name CDS based on a corporate obligation versus the clearing of an illiquid, difficult-to-value single-name CDS based on a sovereign debt).
139 See infra note 149 and accompanying text.
141 For instance, the referent in a CDS might be whether a certain entity (e.g., a sovereign country or a large corporation) defaults on an obligation. This would be a “single-name” CDS. Or the referent might be whether a group of entities defaults on an obligation (a “multiple-name” CDS).
clearing market, where the tension between the tendency of the clearing markets to converge and the tendency of derivatives instruments toward uniqueness is sometimes irreconcilable. Some IRS and CDS simply cannot be cleared.\textsuperscript{142} While clearinghouses engraft a modicum of standardization onto the derivatives markets,\textsuperscript{143} some derivatives are too niche or too illiquid for a clearinghouse to handle.\textsuperscript{144} Hence, in circumscribing a relevant product market, we must exclude unclearable derivatives. Other types of uncleared derivatives, too, should be excluded.\textsuperscript{145}

\textbf{i. Clearing of interest rate swaps}

For IRS clearing, the relevant product market is most appropriately defined as the entire market for cleared IRS. Unclearable IRS, as well as IRS trades exempt from the clearing mandate, are therefore excluded. An alternative that defines the product market as all cleared IRS is too broad, since a clearinghouse cannot functionally guaranty trades in uncleared products and need not guaranty trades between counterparties exempt from the clearing mandate. Similarly, to define the market as the clearing of one specific type of IRS is too narrow.

This market definition should be fairly uncontroversial; it has been adopted by the few academics and industry groups that have sifted through the data necessary to calculate market shares.\textsuperscript{146} Within these parameters, the resulting upstream clearing market for IRS is approximately $404 trillion in size.\textsuperscript{147} However, the Bank for

\textsuperscript{143} Clearing demands fungibility. If a member defaults on a trade, the clearinghouse auctions off that member’s positions; “unwinding” the trade substitutes the defaulting counterparty with an altogether unaffiliated party. See CFTC Roundtable, supra note 22, at 44 (comments of Bill Hill).
\textsuperscript{144} See supra note 142.
\textsuperscript{145} “Unclearable” is not the same as “uncleared.” Unclearable trades cannot be handled by clearinghouses, while uncleared trades might be clearable but for some reason aren’t cleared—for instance, trades which are exempt from the central clearing mandate. Organizations which tabulate clearing volumes often switch between the two terms.
\textsuperscript{146} See ISDA, \textit{Interest Rate Derivatives}, supra note 142; Li & Surti, supra note 35. ISDA and Li & Surti have combed through data compiled by DTCC, Markit, TriOptima, and BIS, all of whom track notionals slightly differently.\textsuperscript{147} ISDA, \textit{Interest Rate Derivatives}, supra note 142, at 2-5. As of June 30, 2013, clearinghouses were handling approximately $404 trillion in interest rate derivatives. Id. at 3. Trade compression eliminated $239 trillion in notionals, resulting $144-157 trillion in uncleared products, comprised of uncleared derivatives ($65 trillion), derivatives products denominated in currencies that
International Settlements ("BIS"), which compiles derivatives statistics, double-counts cleared derivatives. In other words, BIS counts a trade between clearinghouse members A and B as (i) one trade between party A and the clearinghouse-guarantor and, separately, (ii) one trade between party B and the clearinghouse-guarantor (see Figure 1). Adjusted for double-counting, the size of the cleared IRS market becomes $202 trillion.\footnote{Id. at 3.}

**Figure 1: Double-Counting of Cleared Trades**

Left: One trade between two clearinghouse members.
Right: The same trade novated to the clearinghouse and then booked as two trades.

\[\text{ii. Clearing of credit default swaps}\]

For CDS clearing, market definition is more protean. In the adjacent trading market, liquidity pools—i.e., trading activity—for most derivatives have been fracturing for some time, so that instruments based on U.S. referents are traded primarily among U.S. dealers and instruments based on European referents are traded primarily among European dealers. This trend is most pronounced in the IRS markets, where in fourth quarter 2014, 87.7\% of the euro IRS transactions occurred exclusively between European dealers.\footnote{See ISDA, Cross-Border Fragmentation of Global Derivatives: End-Year 2014 Update 2-3 (2014). As a counterpoint, however, fragmentation in the U.S. dollar IRS market is more subtle. For details, see id. at 9-10.}

No comparable studies of market fragmentation have been undertaken for the CDS markets; however, at present there are two major clearinghouses for CDS, both operated by the Intercontinental Exchange ("ICE")—ICE Clear Credit, “the world’s first dedicated CDS clearing house,” and ICE Clear Europe, which serves the European CDS market.\footnote{Credit Derivatives, INTERCONTINENTAL EXCHANGE, https://www.theice.com/credit-derivatives (last accessed Oct. 13, 2015).}

Fragmentation of the downstream trading market has not affected the upstream clearing of IRS. As the next Subsection shows,
one giant clearinghouse, SwapClear, provides the lion’s share of clearing services for the world’s IRS trades. Yet the CDS clearing markets are serviced by two dominant providers, whose footprints are beginning to splinter along geographic lines.\footnote{For products cleared by each entity, see ICE Clear Credit, INTERCONTINENTAL EXCHANGE, https://www.theice.com/clear-credit (follow the link to “CDS Cleared Contracts”); ICE Clear Europe CDS, https://www.theice.com/clear-europe/cds (follow the link to “CDS Cleared Contracts”).}

For now, there is still overlap between the two ICE clearinghouses. Thus, this Article treats the global market for CDS clearing as one market, rather than partitioning it into a U.S. market and a European market.\footnote{This is the approach of Lin & Surti, supra note 35, at 8. Nonetheless, there are two other possibilities: (i) defining two clearing markets, corresponding to CDS based on U.S. versus European referents, and (ii) defining a submarket for European-based CDS within the broader market for all cleared CDS. Either alternative risks being criticized for prejudicing the ICE clearinghouses by rendering a finding of high market share (and, therefore, market power) inevitable. See Kaplow, Why (Ever) Define Markets?, supra note 36, at 440.} This approach yields a market that, in second quarter 2013, was $5.171 trillion in size.\footnote{Robust analysis of the CDS clearing market is difficult to come by. For one study breaking down the CDS market into cleared and uncleared segments, see DTCC, Trade Information Warehouse Reports, available at http://www.dtcc.com/repository-otc-data (follow link to “Centrally Cleared Credit Trade Analysis”) (calculating new cleared trades at $5.171 trillion, or 27.38%, out of a total gross notional of $18.88 trillion).} Not adjusted for double counting, the figure becomes $10.342 trillion.\footnote{DTCC adjusts for double counting. See DTCC, Centrally Cleared Credit Trade Analysis, available at http://www.dtcc.com/repository-otc-data (follow link to “Explanation of Centrally Cleared Trade Analysis”).}

3. Calculating market shares

In the IRS clearing market, one entity towers above all else: SwapClear, the IRS clearinghouse owned by LCH.Clearnet.\footnote{On how SwapClear rose to prominence, see Natasha de Terán, How the World’s Largest Default Was Unraveled, FIN. NEWS (Oct. 13, 2008), archived at http://perma.cc/JB66-52TV.} In 2013, SwapClear processed $391 trillion of the $404 trillion IRS clearing market (96.8%) (see Table 1).\footnote{ISDA, Interest Rate Derivatives, supra note 142, at 3; Lin & Surti, supra note 35, at 8.} By contrast, CME Group cleared $6 trillion (1.49%) and the Japan Securities Clearing Corporation (“JSCC”) $6.6 trillion (1.63%).\footnote{ISDA, Interest Rate Derivatives, supra note 142, at 3.}

In the CDS clearing market, ICE Clear Credit and ICE Clear Europe are the largest firms. ICE reported that these two firms cleared a combined $10.2 trillion in CDS trades in 2012 and $10.7 trillion in 2013.\footnote{For products cleared by each entity, see ICE Clear Credit, INTERCONTINENTAL EXCHANGE, https://www.theice.com/clear-credit (follow the link to “CDS Cleared Contracts”); ICE Clear Europe CDS, https://www.theice.com/clear-europe/cds (follow the link to “CDS Cleared Contracts”).}
trillion in 2013.\textsuperscript{158} This comports with the growth of the overall CDS trading and clearing markets from 2012 to 2013.\textsuperscript{159} If we assume that in second quarter 2013, the two ICE clearinghouses handled approximately $10.2 trillion in CDS trades,\textsuperscript{160} then it becomes clear that these two entities are the dominant providers, handling 98.6\% of centrally cleared CDS trades ($10.342 trillion).\textsuperscript{161} The other providers—CME CMDX in North America, Eurex Credit Clear and LCH.Clearnet SA in Europe, and JSCC and Tokyo Financial Exchange in Japan—are much smaller.\textsuperscript{162}

**Table 1: Market Shares for the Dominant IRS and CDS Clearinghouses**

<table>
<thead>
<tr>
<th>Clearing Market</th>
<th>Notionals for All Cleared Trades</th>
<th>Dominant Clearinghouse (“CH”)</th>
<th>Notionals Cleared by Dominant CH</th>
<th>Market Share of Dominant CH</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRS</td>
<td>$404 trillion</td>
<td>SwapClear</td>
<td>$391 trillion</td>
<td>96.8%</td>
</tr>
<tr>
<td>CDS</td>
<td>$10.342 trillion</td>
<td>ICE Clear Credit and ICE Clear Europe</td>
<td>$10.2 trillion</td>
<td>98.6%</td>
</tr>
</tbody>
</table>

The dominance of SwapClear, ICE Clear Credit, and ICE Clear Europe corroborates the hypothesis that clearinghouses are natural monopolies. By all estimates, the clearing markets for OTC derivatives are poised to grow, as more trades fall into the scope of the central clearing mandate.\textsuperscript{163} This trend can only strengthen the lock of SwapClear and ICE on market share; with time, these entities will enjoy greater revenue and be able to net even more trades.


\textsuperscript{159} See ISDA, CDS Market Summary, Chart 3 (2013) (tracing the growth of CDS new market activity from $15.0 trillion in 2012 to $17.3 trillion in 2013).

\textsuperscript{160} Trading in derivatives instruments fluctuates wildly. See Todd Skarecky, CDS Clearing Data, Clarus Financial Technology, http://www.clarusft.com/cds-clearing-data/ (Apr. 14, 2015). Data on CDS trading and clearing therefore can get murky at times, depending on the time period analyzed. Another variable is the extent to which ICE’s figures double-count the CDS based on European referents which are cleared at both ICE Clear Credit and ICE Clear Europe.

\textsuperscript{161} See supra note 154 and accompanying text; Lin & Surti, supra note 35, at 8 (SwapClear and the two ICE clearinghouses “novate close-to-100 percent of centrally cleared derivatives trades in their respective markets.”).

\textsuperscript{162} BIS, OTC Derivatives Statistics at End-December 2014, 11 n.6 (2015).

\textsuperscript{163} See, e.g., ISDA, 2014 Year in Review, supra note 132.
However, for a conclusion of high market power, two other variables are relevant: the elasticity of consumer demand and the elasticity of rivals’ supply.\(^{164}\) Consideration of these two factors means that the relationship between market share and market power is more nuanced than a straightforward tautology. Although difficult to measure directly, both sets of demand can be easily estimated as fairly inelastic. In the clearing markets, consumers (i.e., traders) must have their trading activities centrally cleared, with few exceptions.\(^{165}\) Consumers cannot seamlessly switch between clearinghouses because network effects make it expensive to choose smaller providers. Thus, the elasticity of demand is low. Antitrust sometimes takes comfort in competition for a market, even if there is little competition within a market.\(^{166}\) But regulation erects such high barriers for entry that the few insurgent firms managing to register as clearing organizations will have a difficult time wrenching away market share from incumbents.\(^{167}\) Hence, the elasticity of supply is low. These patterns are consistent with our observations that the clearing markets are dominated by natural monopolies.

B. The Dealer Markets

1. Concentration and oligopoly characteristics

The downstream dealer market is characterized by a high degree of concentration among an oligopoly of four or five large dealers—who, incidentally, happen to be highly regulated banks and bank holding companies. In the U.S., the Office of the Comptroller of the Currency (“OCC”) publishes quarterly reports on bank derivatives positions.\(^{168}\) These reports reveal that the same institutions always top the list: since 2000, JPMorgan Chase Bank, Citibank, and Bank of America (or their predecessors) have ranked

\(164\) See Landes & Posner, supra note 106, at 939-47.

\(165\) Dodd-Frank includes exceptions for some end-user as well as for hedging purposes. Critics have charged that these exceptions are large enough to frustrate the spirit behind the law. See William F. Kroener III, Dodd-Frank Financial Reform and Its Impact on the Banking Industry, SS038 ALI-ABA 247 (2010).

\(166\) See HOVENKAMP, supra note 34, at 34.

\(167\) For the compliance obligations of derivatives clearing organization, see Dodd-Frank Title VIII, 12 U.S.C. 5461 et seq. But see Crane, supra note 37, at 34 (arguing that exclusion is most concerning not where entry barriers are high, but in a zone of “middling power” where entry barriers are surmountable absent anticompetitive conduct). Professor Crane’s insight is more relevant to the dealer markets than the clearing markets.

among the largest five dealers. Goldman Sachs Bank joined that list during the financial crisis. In its most recent report, the OCC noted that “[d]erivatives activity in the U.S. banking system continues to be dominated by a small group of large financial institutions. Four large commercial banks [the above four] represent 91.1% of the total banking industry notional amounts.”

Facially, at least, a combined market share this high for the largest four dealers (the “four-firm concentration ratio” or “CR4”) far exceeds commonly held thresholds for a tight oligopoly. This degree of concentration confers to the top dealers the greatest cut of the lucrative derivatives trading revenues, which can reach $7-8 billion per quarter. However, as the rest of this Subsection explores, concentration in the dealer markets is more complex than the CR4 would suggest.

Concentration has been alleged as the consequence of central clearing—specifically, the control that dominant dealers exert over the indispensable facility of clearinghouses. JPMorgan Chase, Citibank, Goldman Sachs Bank, and Bank of America are all members of SwapClear, ICE Clear Credit, and ICE Clear Europe. If these institutions set high bars to clearinghouse membership, then rival dealers will be unable to gain entry—a scenario that appears to be playing out since the membership profile of the dominant IRS and CDS clearinghouses remains unchanged from year to year.

170 See, e.g., OCC, Q. REP. ON BANK TRADING & DERIVATIVES ACTIVITIES: FIRST Q. 2014, tbl. 1; FIRST Q. 2013, tbl. 1; FIRST Q. 2012, tbl. 1; FIRST Q. 2011, tbl. 1; FIRST Q. 2010, tbl. 1; FIRST Q. 2009, tbl. 1.
171 OCC, 2015 Q2 REP., supra note 75, at 1.
172 See, e.g., William G. Shepherd, Concentration Ratios, in NEW PALTGRAVE DICTIONARY OF ECONOMICS (1st ed. 1987) (CR4 of 80%); Dep’t of Justice, Merger Guidelines (1968) (75%).
173 See OCC, SECOND QUARTER 2015 REPORT, supra note 171, at Graph 9. In recent years, trading revenues have comprised, on average, 10-13% of the gross revenues for the top four banks. See id. at Graph 10. For Goldman Sachs, a bank with a long history of trading, revenues have reached as high as 65-71% of gross revenues. See id.
174 See supra note 103.
176 See Krattenmaker & Salop, supra note 45.
177 See infra Section IV.A.
It would be as if, returning to our prior analogy, the four dominant airlines set the access criteria for LAX so high as to exclude smaller airlines.\footnote{Coincidentally, air traffic through LAX is dominated by four carriers. See Los Angeles International Airport Top 10 Carriers, January 2015 through August 2015, Los Angeles World Airports, http://www.lawa.org/uploadedfiles/LAX/statistics/aircarrier-2015.pdf.} LAX is a labyrinthine infrastructure run nearly at cost, by the issuance of bonds subject to voluminous disclosures.\footnote{See Airport Basics, Los Angeles World Airports, http://www.lawa.org/ourLAX/ourLAX.aspx?id=9143.} Yet it is also a bottleneck for air traffic into Los Angeles and can be manipulated to suppress competition in the airlines market, where the real revenues lie.\footnote{See CFTC Roundtable, supra note 22, at 47 (statement of Jason Kastner).}

Before charges of exclusion can be leveled, though, market power must be assessed. It turns out that market definition and the calculation of market shares are even trickier for the downstream dealer markets than for the upstream clearing markets. There are strong disagreements over whether the dealer markets truly are concentrated. From the OCC’s viewpoint, a perennial four-firm oligopoly cornering over 90% of the trading market means that the market is concentrated.\footnote{Supra notes 169, 171.} However, ISDA, the derivatives dealer trade group, maintains that trading is a global market, and when dealer notionals are evaluated from a global perspective, concentration diminishes.\footnote{See ISDA, Dealer Concentration, supra note 35.} At the other end, the BIS gauges dealer concentration by slicing the market into discreet products—for example, IRS based on the U.S. dollar, Canadian dollar, euro, Swiss franc, Sterling, Swedish krona, and Japanese yen.\footnote{See BIS, OTC Derivatives Statistics, supra note 133, at Table 9a.} The result, counterintuitively, is that concentration is rather low.\footnote{See id.} As Professor Kaplow expects, the various sides of the debate appear to be defining the market broadly or narrowly in defense of their arguments.\footnote{See Kaplow, Why (Ever) Define Markets?, supra note 36, at 470-74.}

Even if the market is concentrated, explanations might vary as to why it is so. With CDS, dealers have historically been large, well-capitalized financial institutions because default on an underlying obligation can require the dealer to pay a substantial amount to close out the position.\footnote{Litan, supra note 181, at 28. See also CDS Antitrust Litig. Markit Mem., supra note 93, at 5 (describing the “cliff risks” of CDS).} Dealers, for their part, hedge their positions by entering into offsetting swaps with other large,
well-capitalized financial institutions—thereby consolidating the notionals, as well as the risks, within a small circle of big banks. 187

Another possible explanation is that derivatives products, in particular IRS, may be purchased as a condition for obtaining a loan. 188 In lending to a borrower at a variable rate, a bank might ask that the borrower take out an IRS, to mitigate the volatility of fluctuating rates and also protect the bank’s interest in the underlying credit. 189 Coincidentally, three of the top derivatives dealers are also the nation’s largest commercial banks: JPMorgan Chase, Bank of America, and Citibank. 190 This coincidence might be the result of decisions by borrowers to purchase swaps from well-capitalized dealers; or it might be attributed to the tying of swaps to loans—a requirement imposed by the lender upon the borrower to buy swaps from an affiliate of the lender. 191

For our purposes, the above details affect how the market is defined to either validate or dispel claims of concentration. How broadly the geographic and product markets are drawn affects our perspective on concentration. So, too, does how we account for the market shares of (i) large lending institutions that are smaller participants in the derivatives trading market and, conversely, (ii) large derivatives dealers that are smaller participants in the lending market. In defining the dealer market and then calculating the market shares, the remainder of this Subsection addresses these considerations.

187 Litan, supra note 181, at 28.
191 If so, then commercial banks are leveraging their dominance in the lending market (where, these days, low interest rates constrict return on investment) into dominance in the dealer market (where the profits are much greater). See Felix B. Chang, Death to Credit as Leverage: Using the Bank Anti-Tying Provision to Curb Financial Risk, 9 NYU J. L. & Bus. 851 (2013).
2. Defining the market

i. The product market

The easiest way to define the byzantine dealer market is to proceed, as above, with a straightforward analysis of the relevant product and geographic markets. The central question in defining the product market is whether we look at the dealer market for all derivatives or whether we define the market around specific products. The OCC examines notional amounts for all derivatives, as well as futures (exchange-traded), options (OTC and exchange-traded), forwards (OTC), spot foreign exchange, swaps (OTC), and credit derivatives (OTC). BIS breaks down the markets into even smaller slivers—e.g., IRS by referent currency.

This Article opts to combine all IRS into one market and all CDS into another market, so as to align with the product market definition for clearing services. In doing so, this Article uses OCC data on notional amounts for the “swaps” and “credit derivatives” categories, which correspond closely (but not perfectly) to IRS and CDS.

Beyond antitrust, the proclivity of financial regulators is to aggregate notional amounts for all derivatives products (exchange-traded and OTC), to generate an easy snapshot of derivatives notionals as compared to assets held. This snapshot helps regulators gauge the extent of leverage. Yet this is too broad a perspective for our purposes. Additionally, it might make sense to define the product

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192 See supra Section II.A.2.
193 A future is the obligation to buy or sell a position when the value of that position attains a predetermined price (the “strike” price).
194 An option is the right to buy or sell a position when the value of that position attains the strike price. Options can either be exchange-traded or OTC.
195 Like futures, a forward is the obligation to buy or sell at a preordained strike price; however, forwards are customized and traded over-the-counter, rather than on exchanges.
196 A spot foreign exchange is a one-time foreign exchange (i.e., currency exchange) transaction between two parties.
197 OCC, 2015 Q2 REP., supra note 75, at tbl. 1.
198 See BIS, OTC Derivatives Statistics, supra note 133, at Table 9a.
199 The correspondence is imperfect because “IRS” is slightly broader than “swaps,” as defined by the OCC. See OCC, 2015 Q2 REP., supra note 75, at 12. Credit derivatives, by contrast, are comprised almost entirely of CDS. See id. at tbl. 12.
200 E.g., see id. at tbl. 1.
201 On the other hand, BIS defines the market too narrowly, by carving up IRS into referent products. See supra note 183-84 and accompanying text.
market around *all OTC derivatives*, since the dealers that dominate the IRS and CDS markets also dominate the OTC forwards and options markets. Because clearinghouses have the capacity to net across different instruments—and will likely do so in the future—amalgamating all OTC derivatives into one market anticipates that shift in the upstream market.

An ancillary question is whether the product market should track dealers which are commercial banks. Given that IRS and CDS might be tied to loans, trading at the commercial banks would seem the appropriate benchmark. However, this Article argues that the market should be defined around the trading activities of bank holding companies (“BHCs”). A BHC is a company that owns or controls one or more banks; the subsidiaries might be engaged in commercial lending, or they might be engaged in other activities, such as investing or selling insurance. Today, with tighter capital adequacy requirements for banks, derivatives trading activity has migrated away from commercial banks and into the realm of other affiliates. Notional amounts at the BHC level illustrate this movement.

Although trading figures for commercial banks creates the impression of a four-firm oligopoly, the figures for BHCs reveal that the dealer market has been cornered by *five* firms: JPMorgan Chase, Citigroup, Goldman Sachs, Bank of America, and Morgan Stanley. A five-firm oligopoly is more difficult to condemn than a four-firm one, since exclusionary schemes will be harder to garner

202 See OCC, 2015 Q2 REP., supra note 75, at tbl. 1.
203 See, e.g., Duffie & Zhu, supra note 140 (arguing that a universal clearinghouse which can net across assets maximizes netting efficiency). At the very least, however, the demarcation between exchange-traded and OTC derivatives should be preserved, because the clearing and trading of exchange-traded products is quite different. See Wolkoff & Werner, supra note 84.
204 See supra notes 188-91 and accompanying text.
208 (see infra? or OCC?)
209 See id. at tbl. 1.
210 See id. at tbl. 2.
support from five players than four. Nonetheless, this is the more accurate approach; as Subsection III.C demonstrates, clearinghouse membership rosters always include Morgan Stanley, in addition to affiliates of the large commercial banks. Morgan Stanley, like Goldman Sachs, had traditionally been an investment bank that, during the financial crisis, reorganized into BHC with a commercial bank subsidiary to avail itself of federal funds.

ii. The geographic market

For the geographic market, this Article advocates carving out the U.S. as a standalone market. Clearing markets, by contrast, are global because netting can be performed rather effortlessly across borders; clearinghouses also draw members from large financial institutions around the world. Derivatives dealers, too, can trade across distances easily, but their consumers’ preferences tend to be more local.

The trading activities of HSBC North America Holdings, Inc. (“HSBC”), for instance, reflect the localized nature of the dealer market. A subsidiary of the London-based HSBC Holdings plc, HSBC ranks seventh in its total derivatives notional according to the OCC. While HSBC is a global player in the financial markets, especially in Europe and Asia, its position is far weaker in the U.S. Indeed, affiliates of HSBC are members of every major

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211 See Hemphill & Wu, supra note 6, at 1230 (oligopoly size is “important in determining the stability of parallel exclusion”).
212 See Michael J. de la Merced et al., As Goldman and Morgan Shift, a Wall St. Era Ends, N.Y. TIMES, Sept. 21, 2008, http://dealbook.nytimes.com/2008/09/21/goldman-morgan-to-become-bank-holding-companies/. Today, Goldman Sachs and Morgan Stanley have diverged slightly in that most of Goldman Sach’s trading activities is undertaken at the commercial bank level, while most of Morgan Stanley’s trading activities is conducted outside the commercial bank. Compare OCC, 2015 Q2 Rep., supra note 75, at tbl. 1, with id. at tbl. 2.
213 See infra Section III.C.
214 For instance, a Dallas-based airline might purchase an oil swap from a Houston- or Chicago-based dealer; the dealer itself will hedge its exposure with one of the dominant U.S.-based dealers.
215 See OCC, 2015 Q2 Rep., supra note 75, at tbl. 2. HSBC’s swaps notional total $2.928 billion, compared with $18.754 billion for fifth-ranked Morgan Stanley and $4.370 billion for sixth-ranked Wells Fargo, and HSBC’s credit derivatives total $221 million, compared with $1.646 billion for fifth-ranked Morgan Stanley and $28 million for sixth-ranked Wells Fargo. Id.
clearinghouse, but their market share within the U.S. cannot compare with the shares of the large U.S. dealers.

Thus, the dealer markets are most appropriately defined as the overall market for IRS and the overall market for CDS—or, alternatively, all OTC derivatives—sold in the U.S. For now, the best source on the size of these markets is the OCC’s quarterly reports. The OCC’s methodology, however, is vulnerable on two fronts: it factors in the global trading activity of U.S. dealers, and it fails to account for the U.S. trading activity of dealers domiciled outside the U.S. In the absence of data focusing solely on activity in the U.S. geographic market, we must contend with the OCC’s numbers, along with all its infirmities. Regarding the role of non-U.S. dealers, that concern is less powerful—consumers of derivatives products purchase from the providers in their local or national market. Further, if the tying of swaps to loans is prevalent, then it is all the more likely that derivatives are sold by affiliates of the local or national lender.

From the OCC’s numbers, we can calculate the sizes of the dealer markets as approximately $142.069 trillion for IRS, $12.410 trillion for CDS, and $234.308 trillion for all OTC derivatives (see Table 2).

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216 See infra Section III.C.
218 See ISDA, Dealer Concentration, supra note 35, at 1-2.
219 See supra notes 188-91 and accompanying text.
221 OCC, 2015 Q2 Rep., supra note 75, at tbl. 2. Importantly, these figures are not adjusted for double-counting from inter-dealer transactions. See ISDA, Dealer Concentration, supra note 35, at 1. The OCC pulls these numbers from the call reports filed by banks and BHCs. Therefore, if Goldman Sachs and JPMorgan Chase have entered into a $10 million trade, the trade will be reported by both parties in their call reports, for a total of $20 million.
Table 2: Assets and Notional Amounts (in Millions)
for Selected U.S. Bank Holding Companies\textsuperscript{222}

<table>
<thead>
<tr>
<th>BHC (Top 8)</th>
<th>Total Assets</th>
<th>Total Derivatives</th>
<th>OTC Swaps (IRS)</th>
<th>OTC Credit Derivatives (CDS)</th>
<th>All OTC Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citigroup</td>
<td>$1,829,370</td>
<td>$55,293,239</td>
<td>$31,174,749</td>
<td>$2,396,456</td>
<td>$49,534,050</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>$859,932</td>
<td>53,008,470</td>
<td>30,819,292</td>
<td>2,288,185</td>
<td>48,781,825</td>
</tr>
<tr>
<td>JPMorgan Chase</td>
<td>2,447,994</td>
<td>52,957,671</td>
<td>27,403,246</td>
<td>3,680,160</td>
<td>49,965,822</td>
</tr>
<tr>
<td>Bank of America</td>
<td>2,152,082</td>
<td>45,662,998</td>
<td>24,934,086</td>
<td>2,123,589</td>
<td>41,937,487</td>
</tr>
<tr>
<td>Morgan Stanley</td>
<td>825,755</td>
<td>32,975,519</td>
<td>18,753,632</td>
<td>1,645,781</td>
<td>29,547,494</td>
</tr>
<tr>
<td>Wells Fargo</td>
<td>1,720,617</td>
<td>6,042,653</td>
<td>4,369,687</td>
<td>28,460</td>
<td>5,573,317</td>
</tr>
<tr>
<td>HSBC North America</td>
<td>277,249</td>
<td>4,571,245</td>
<td>2,928,512</td>
<td>220,682</td>
<td>4,463,742</td>
</tr>
<tr>
<td>State Street</td>
<td>294,571</td>
<td>1,320,548</td>
<td>8,921</td>
<td>229</td>
<td>1,308,194</td>
</tr>
<tr>
<td>Total for the Top 25 Holding Companies</td>
<td>14,156,743</td>
<td>255,241,727</td>
<td>142,068,615</td>
<td>12,410,184</td>
<td>234,308,624</td>
</tr>
</tbody>
</table>

3. Calculating market shares

Market shares at the BHC level show that a five-firm oligopoly that has cornered well over 90% of the relevant markets (see Table 3).\textsuperscript{223}

Table 3: Market Shares for the Dominant U.S. Dealers

<table>
<thead>
<tr>
<th>BHC (Top 5)</th>
<th>OTC Swaps (IRS)</th>
<th>OTC Credit Derivatives (CDS)</th>
<th>All OTC Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citigroup</td>
<td>21.94%</td>
<td>19.31%</td>
<td>21.14%</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>21.69%</td>
<td>18.44%</td>
<td>20.82%</td>
</tr>
<tr>
<td>JPMorgan Chase</td>
<td>19.29%</td>
<td>29.65%</td>
<td>21.32%</td>
</tr>
<tr>
<td>Bank of America</td>
<td>17.55%</td>
<td>17.12%</td>
<td>17.90%</td>
</tr>
<tr>
<td>Morgan Stanley</td>
<td>13.20%</td>
<td>13.26%</td>
<td>12.61%</td>
</tr>
</tbody>
</table>

\textsuperscript{222} The figures are taken from OCC, 2015 Q2 Rep., supra note 75, at tbl. 2. Dealers ranked 6-8 are included for comparative purposes.

\textsuperscript{223} See id.
But what do these market shares mean? Asked another way, what insights can we glean about market power from the fact that this much of the market belongs to the top five dealers? Without some archetype for appropriate market concentration, these numbers are meaningless.\footnote{This is one of Professor Kaplow's most emphatic critiques of the market definition/market share paradigm. \textit{See Kaplow, Why (Ever) Define Markets?}, supra note 36, at 459-62. \textit{See also} Crane, supra note 37, at 35-39.}

Fortunately, market share need not be assessed in a vacuum. We can look to other factors to gain an understanding of the market power that is exercised by these five firms.\footnote{Context is extremely important; a five-firm oligopoly in derivatives trading will be very different than a five-firm oligopoly in other industries. To fill out the context, antitrust has devised tools such as anticompetitive effects and procompetitive justifications.} As we shall see, there might be intense competition within the oligopoly (that is, among the five large dealers),\footnote{\textit{See CDS Antitrust Litig. Dealer Joint Mot., supra note 92, at 21 ("there are no factual allegations that the twelve dealer-defendants failed to compete with each other in their OTC trading of CDS (to the contrary, they compete fiercely")").} but the oligopoly stifles exogenous competition (that is, competition from the smaller dealers).

One way to forecast the behavior of the five dealers is to do a deeper dive into market concentration. Decades ago, the prevailing measure of concentration was the four-firm concentration ratio.\footnote{\textit{Hovenkamp}, supra note 34, at 565-66.} Measured at the BHC level, the CR4 is 80.47% for IRS, 84.52% for CDS, and 81.18% for all OTC derivatives.\footnote{\textit{See supra} Table 3.} These CR4s surpass the thresholds at which exacting scrutiny of mergers is triggered. A CR4 greater than 75% is ostensibly so high that a market is presumed to be conducive to coercion.\footnote{\textit{See Hovenkamp, supra} note 34, at 566 (noting that a consensus emerged among the courts that a CR4 exceeding 75% was conducive to coercion). On the other side, ISDA has measured the CR4 at 40.0% for interest rate derivatives, 40.8% for credit derivatives, and 39.5% for all derivatives. \textit{See ISDA, Dealer Concentration, supra} note 35, at 3. This is because ISDA insists that derivatives activity is global in nature and, thus, the market should be defined globally. \textit{See id.} at 1-2. In doing so, global notionals are divided among roughly 14 dealers rather than five. \textit{Id.} at n.2.} The contemporary approach to market concentration is the Herfindahl-Hirschman Index (“HHI”), which is the sum of the squares of the market shares of all firms within a market. This measure accounts for “both the distribution of the market shares of the top four firms and the composition of the market shares of the smaller dealers.”

\textit{But what do these market shares mean? Asked another way, what insights can we glean about market power from the fact that this much of the market belongs to the top five dealers? Without some archetype for appropriate market concentration, these numbers are meaningless.}
outside the top four firms.” For the relevant dealer markets, the approximate HHIs are as follows: over 1807 for IRS, over 2061 for CDS, and over 1815 for all OTC derivatives. These numbers fall into the “moderately concentrated” range under today’s Department of Justice (“DOJ”) Merger Guidelines.

As for whether the HHI or the CR4 is the better benchmark in this industry, the answer is difficult to pin down. The CR4 is a better predictor of collusion where the major players are similar in size, while the HHI better depicts a non-cooperative oligopoly where the major players differ in size. The derivatives dealer market is somewhere in between: the largest five dealers are similar, but not identical in size, and each of the five is several times larger than all dealers outside the oligopoly. The slight differences within the group of five are likely not significant enough that any single dealer is the price leader; in fact, the pattern from quarter to quarter seems to be that the order of the top four dealers will shift. Neither the HHI nor the CR4 alone fully portrays the dynamics of the dealer market, especially since each measure entails its own narrative—collusion for CR4 and non-cooperative oligopoly for HHI. On balance, though, because this Article focuses on parallel (that is, independent) exclusion, the HHI narrative is more fitting. However, In re CDS Antitrust Litig. shows that collusion is hardly beyond the pale for the large dealers.

A second way to make sense of the market share calculations is to analyze the entry barriers. Unlike the clearing markets, the downstream dealer markets are not beset by large sunk costs and high regulatory barriers. Indeed, the OCC’s quarterly reports show that a number of firms are active in the derivatives markets. Yet this does not mean that these “moderately concentrated” markets,
under the DOJ’s HHI benchmark, are beyond reproach. Far from it. Where a small group of firms enjoys “middling market power,” exclusion is arguably of greater concern, since entry barriers are surmountable and anticompetitive conduct is required to keep rivals out. The persistence of concentration—at the hands of the same dealers—therefore suggests that exclusion is at work.

Perennial dominance by the same firms therefore constitutes a third feature that helps interpret concentration in the dealer markets. An oligopoly’s stability bespeaks exclusion. As will be discussed in greater detail in the next Subsection, stability confirms that the dealer oligopoly’s high market shares translates into—or is evidence of—substantial market power, in a manner that enables exclusion.

The picture that emerges from the calculation of market shares, then, is one where competition is suppressed at the national level. The clearing markets for IRS and CDS might be global, but the trading markets are broken up into countries or regions, each dominated by a small circle of financial institutions that have an uncanny ability to maintain dominance regardless of market transformations.

C. Stability of the Dealer Oligopoly

Parallel exclusion requires a finding that there is sufficient market power to produce anticompetitive effects. Simply noting that two complementary markets are concentrated is not enough to conclude that parallel exclusion is at work, much less pernicious exclusion whose anticompetitive effects outweigh its procompetitive justifications. The four major airlines serving LAX, for instance, collectively control over 60% of the airport’s traffic, but without more, this does not amount to exclusion. For this reason, Professors Hemphill and Wu add another factor to the market power inquiry: the stability of the excluders. Where the dominant players are few, exclusionary schemes are likelier to succeed.

236 See supra note 232 and accompanying text.
237 See Crane, supra note 37, at 34, 52-54.
238 Hemphill & Wu, supra note 6, at 1222-26.
239 See Hemphill & Wu, supra note 6, at 1237.
241 Hemphill & Wu, supra note 6, at 1237-38.
242 Id.
This intuition bears out in the derivatives markets, whose infrastructures are more susceptible to capture by major dealers than airports are by major airlines. It turns out that the major dealers drive clearinghouse membership and risk standards, and even when those standards change, clearinghouse membership profiles remain the same. This stasis validates the intimations of market power from market share analysis. It also fits within a wider trend: the ingenuity of the dealer oligopoly at preserving dominance.

For years, the five large dealers have controlled trading in OTC derivatives; their precise ordering within the oligopoly might have shifted from quarter to quarter, but as a block they have pulled far ahead of all other dealers. Thus, other than reorientation inside and outside the oligopoly, no other dealer has managed to break into the oligopoly. In this respect, the evolution of the CDS dealer market is especially poignant. The top five dealers dominated the market before In re CDS Antitrust Litig. and during its proceedings. The OCC has not yet reported notional amounts for the quarters following settlement, but the results are not likely to change. The membership rosters for ICE Clear Credit and ICE Clear Europe, which are updated more frequently and which can serve as loose proxies for the headway of smaller dealers, barely changed before, during, and after the case.

This pattern of stagnancy is replicated across the IRS and CDS clearinghouses. As Table 4 shows, there is a remarkable degree of correlation among the members of SwapClear, ICE Clear Credit, and ICE Clear Europe. Affiliates of the major players in the U.S. dealer markets are all represented, along with Wells Fargo in some instances. The other members are drawn from large Canadian, European, and Japanese financial institutions.

243 See infra notes 253-55 and accompanying text.
244 See, e.g., supra notes 215, 234.
246 See infra notes 253-55 and accompanying text.
247 On dangers of correlation, see supra Section IV.C; Roe, supra note 27, at 1677–78.
Table 4: Correlation among Large Members of the Major IRS and CDS Clearinghouses

<table>
<thead>
<tr>
<th></th>
<th>SwapClear&lt;sup&gt;249&lt;/sup&gt;</th>
<th>ICE Clear Credit</th>
<th>ICE Clear Europe&lt;sup&gt;250&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank of America&lt;sup&gt;251&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Barclays</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>BNP Paribas</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Citigroup</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Credit Suisse</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Deutsche Bank</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>HSBC</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>JPMorgan</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Morgan Stanley</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Nomura</td>
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<tr>
<td>Société Générale</td>
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<tr>
<td>The Bank of Nova Scotia</td>
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<td>UBS</td>
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<tr>
<td>Wells Fargo</td>
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</tbody>
</table>

The hermeneutic nature of clearinghouses was at issue in *In re CDS Antitrust Litig.*, where the plaintiffs alleged that even well-capitalized applicants could not break in as members. Despite the settlement, the membership profiles today are virtually identical to the membership profiles when the case was pending. From June


<sup>249</sup> SwapClear has two lists—“U.S.-Domiciled Service Members” and a much larger group of “Global Service Members.” All the entries here are taken from the U.S.-domiciled member list, except Bank of America, HSBC, and The Bank of Nova Scotia, which appear under the global members list.

<sup>250</sup> ICE Clear Europe’s members trade in CDS and futures. This table includes only CDS traders. Among these entities, only Bank of America, Citi, JPMorgan, and Morgan Stanley are domiciled in the U.S. The other members (e.g., Goldman Sachs) hold membership in the name of European affiliates.

<sup>251</sup> Merrill Lynch is counted as an affiliate of Bank of America.

<sup>252</sup> See *CDS Antitrust Litig.*, Order, supra note 18, at 5. See also Story, supra note 87 (reporting that Bank of New York Mellon, MF Global, and State Street had been unable to gain admission to the CDS clearinghouses).
2015 to February 2016, for instance, the only change to ICE Clear Credit was that The Royal Bank of Scotland pulled out.\textsuperscript{253} During this time, ICE Clear Europe saw no change in its members who trade in CDS.\textsuperscript{254} Meanwhile, among its U.S.-domiciled members, SwapClear saw no change either.\textsuperscript{255}

This inertia is all the more astonishing, given the strong regulatory pressure to loosen membership criteria. Since Dodd-Frank mandated central clearing for OTC derivatives, the Commodity Futures Trading Commission ("CFTC") and Securities and Exchange Commission ("SEC") have implemented rules aimed at tempering the likelihood that incumbent dealers would use clearinghouses to shut out insurgent dealers.\textsuperscript{256} As a consequence, clearinghouse membership requirements have changed dramatically; minimum capitalization requirements, for example, have gone from $1 trillion\textsuperscript{257} to $100 million\textsuperscript{258} to now $50 million.\textsuperscript{259} It is telling, though, that in all this time, the membership profile of the major clearinghouses has hardly changed. If the members of the major clearinghouses are the same institutions that dominant trading, then clearinghouses are merely an artifice whose creation by regulators might have been well-intended but whose operation has the unintended effect of cementing the dominant dealers' positions in the downstream markets.

The mechanisms that dominant dealers have deployed to protect their dominance are noteworthy. \textit{In re CDS Antitrust Litig.}

\textsuperscript{253} \textit{ICE Clear Credit: Participants, INTERCONTINENTAL EXCHANGE}, https://www.theice.com/clear-credit/participants (archived pages from June, Aug., Oct., and Dec. 2015 and Feb. 2016). On a bi-monthly basis starting from June 2015, the author compiled and compared the membership rosters for the major IRS and CDS clearinghouses to memorialize the changes.

\textsuperscript{254} See \textit{ICE Clear Europe: Membership, INTERCONTINENTAL EXCHANGE}, https://www.theice.com/clear-europe/membership#iceu-J (archived pages from June, Aug., Oct., and Dec. 2015 and Feb. 2016). ICE Clear Europe members who trade only in futures were excluded from this tally.


\textsuperscript{256} See, e.g., 17 C.F.R. 39.12(a)(1) (product and participant eligibility); 39.12(a)(2)(iii) (maximum capitalization requirement capped at $50 million).

\textsuperscript{257} Previously imposed by LCH.Clearnet. See \textit{TURING, supra} note 116, at § 5.6(3); CFTC Roundtable, \textit{supra} note 22, at 25-26.

\textsuperscript{258} See \textit{ICE Clear Credit, Clearing Rules} § 201(b)(ii) (2011), on filed with author. Previously, ICE Clear Credit's requirement was $5 billion in adjusted net capital. See \textit{MF Global Class Action Compl., supra} note 97, at para. 66, 71.

teaches that dealers had resorted to naked collusion to shut out their competitors. Dealer actions appear to be less interdependent now. Collectively, however, the major dealers continue play an outsized role in setting clearinghouse risk standards. The Risk Committee of ICE Clear Credit, the clearinghouse at the center of the case, is comprised of 12 members, three of whom are independent members and nine of whom are clearinghouse members. Presently, the nine insider-members are Bank of America, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, JPMorgan, and Morgan Stanley.\(^{260}\) Five of these are the major U.S. dealers; the other four are major European dealers. ICE Clear Credit’s Risk Committee is reconstituted annually, but the primary criterion for membership on the committee is high Participation Activities, defined as aggregated volume of trades by notional amount.\(^{261}\) And so, even if ICE Clear Credit has promulgated checks on the committee’s authority,\(^{262}\) the committee can shape margin requirements, member contributions to the guaranty fund, and, even more broadly, any “determination” that the clearinghouse makes pursuant to its own rules.\(^{263}\)

If the nine dealer-members of ICE Clear Credit’s risk management committee arrive independently at policies which frustrate the admission of otherwise qualified applicants, what then? For all the structural reforms imposed by financial regulators and the settlement of *In re CDS Antitrust Litig.*, such denials of access would delay the loosening of clearinghouse membership, thereby retaining the lock of large dealers on the downstream market as well as their cut of lucrative trading revenues for as long as artificially possible. As the law stands on monopolization, no recourse is available.

Understandably, the major dealers *should* play some role in shaping clearinghouse policies, since they bear the brunt of risk from derivatives trading.\(^{264}\) After all, notionals are concentrated in the top


\(^{262}\) See, e.g., *id. Rule 501 (the ICE Clear Credit Board not obligated to abide by the Risk Committee’s recommendations).* ICE, too, is at the mercy of the dealers. Because dealers have cornered the lion’s share of CDS notionals, ICE ensures long-term survival by aligning with the dealers more than it would by admitting more members.

\(^{263}\) See *id.* Rules 502, 615.

\(^{264}\) See *ICE Clear Credit Regulation and Governance*, supra note 260, at 3.
dealers, who likely post more collateral and contribute more to the guaranty fund than smaller dealers. Because clearinghouses work to mutualize risk, they must ensure that membership is restricted to well-capitalized and well-run institutions that can weather the shock of another member’s default. It must also be conceded that the outsized role of large dealers in the downstream market is to be expected, given the risks associated with market-making for derivatives.\footnote{Yet those risks may have been attendant in the markets’ early years; today, transparency from the indexing of IRS and CDS and the injection of liquidity from higher trading volumes have greatly mitigated those concerns.} As to the control over clearinghouses wielded by large dealers, it is altogether too easy for incumbent members to hide behind risk mitigation justifications for exclusionary practices.\footnote{More importantly, risk mutualization works best among diverse parties, so a one-dimensional clearinghouse membership profile can end up transmitting, rather than dissipated, systemic risk.} As to the control over clearinghouses wielded by large dealers, it is altogether too easy for incumbent members to hide behind risk mitigation justifications for exclusionary practices.\footnote{Finally, the trends in the OTC derivatives markets at inception are less relevant today. How the large dealers behave now, in the face of market and regulatory transformations, can subject them to renewed antitrust scrutiny. The evidence above suggests that the dealers are acting to keep rivals off the clearinghouses, albeit acting independently without coordination. The dealers certainly have the market power to do so, and the clearinghouses have the market power to facilitate exclusion.}

The attention lavished by this Section upon the market definition/market share paradigm may seem unnecessary and even old-fashioned by today’s standards. Over the last few decades, antitrust has become comfortable enough with inferring market power from anticompetitive effects that market power need not be gauged by way of market definition.\footnote{Nevertheless, this Article opts for the traditional approach (and, consequently, a long Section}
on market power) because the ultimate goal is different than a re-
examination of market definition—it is to push Section 2 jurisprudence toward recognizing shared monopoly, so as to redress parallel exclusion. In the service of that goal, this Article aims to head off any criticism over the rigor of its analysis of market power. While market definition provides the ancillary benefit of highlighting blindspots in financial regulation, its major benefit is to pre-empt the distracting arguments that would have flowed from going straight to anticompetitive effects.

IV. HARMS OF PARALLEL EXCLUSION

Exclusionary schemes do not draw censure unless their anticompetitive effects outweigh the enhanced efficiencies. Alternately conceived, their harms must outweigh their benefits. This Section evaluates the harms of parallel exclusion in derivatives markets, leaving the benefits and the balancing to Section V. The harms are evaluated from three different standpoints: competition (Section IV.A), consumers (Section IV.B), and systemic risk (Section IV.C).

The effects of concentration in the derivatives markets have been explored elsewhere. As such, this Section will strive to connect the Article to other scholarly trends. One trend is the burgeoning idea that competition and systemic risk are dueling interests, which itself is a variation of the old debate in banking over whether competition enhances stability. Another trend is a recent pivot to antitrust for solutions to problems in finance—for example, the impulse of financial intermediaries to impede transparency and efficiency. Channeling the malleability that these scholars see in antitrust, this Section frames “harms” broadly, so as to encompass

270 For a summary, see infra notes 109-13 and accompanying text.
271 Hovenkamp, supra note 34, at 298; Hemphill & Wu, supra note 6, at 1237-38.
272 See, e.g., Chang, supra note 14; Greenberger, supra note 21; Litan, supra note 181; Tuberville, supra note 21.
not only anticompetitive effects but also the health of the financial system.\footnote{Of course, this proposition must contend with the antitrust injury standing requirement. See \textit{supra} notes 319-22 and accompanying text.}

A. \textit{To Competition}

Exclusionary schemes harm competition. Under the theories of leveraging and foreclosure, the dominance of a firm in one market (e.g., an airport or a clearinghouse) can be parlayed into dominance in another market (commercial air traffic or derivatives trading) if there is sufficient nexus between the two markets.\footnote{See \textit{Hovenkamp}, \textit{supra} note 34, at 348-49. For criticisms, see Richard S. Markovits, \textit{ Tie-ins, Reciprocity, and the Leverage Theory Part II: Tie-ins, Leverage, and the American Antitrust Laws}, 80 \textit{YALE L.J.} 195 (1970); Richard A. Posner, \textit{The Chicago School of Antitrust Analysis}, 127 \textit{U. PA. L. REV.} 925, 929 (1979).} Leveraging and foreclosure work all the better if one market is controlled by a natural monopoly that is indispensable to an adjacent market, and the dominant firms in the adjacent market direct the natural monopoly.\footnote{With a natural monopoly, market power in at least one market is assured. From this was borne the essential facilities doctrine. See \textit{Aspen Skiing Co. v. Aspen Highlands Skiing Corp.}, 472 \textit{U.S.} 585, 587 (1985); Stephen M. Maurer \& Suzanne Scotchmer, \textit{The Essential Facilities Doctrine: The Lost Message of Terminal Railroad}, (UC Berkeley Public Law Research Paper No. 2407071 2014), \texttt{http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2407071}. Detractors of this doctrine are numerous and eminent. See, e.g., Phillip Areeda, \textit{Essential Facilities: An Epithet in Need of Limiting Principles}, 58 \textit{ANTITRUST L.J.} 841 (1990); \textit{Hovenkamp, The Antitrust Enterprise: Principle and Execution} 237 (2005); \textit{Verizon Communications Inc. v. Law Offices of Curtis V. Trinko} 540 \textit{U.S.} 398 (2004).}

In derivatives markets, the anticompetitive effects of convergence in clearing and trading are not theoretical, but real. Contemporaneous with \textit{In re CDS Antitrust Litig.}, was an action by the brokerage firm MF Global against virtually the same set of defendants for cornering the CDS trading market by restricting access to ICE Clear Credit.\footnote{See MF Global Complaint, \textit{supra} note 97.} \textit{In re CDS Antitrust Litig.} itself shows how large dealers forestalled the development of exchanges and alternative clearinghouses, innovations that would have moved the CDS market more quickly along its trajectory toward transparency and efficiency.\footnote{See \textit{supra} text accompanying notes 83-85.}

Consolidation and settlement of the cases brought about certain reforms—for example, commitment by ICE to build an open-
access, anonymous CDS trading platform similar to an exchange.\textsuperscript{280} Fortuitously, the platform appears to replicate the exchange that the large dealers had driven to the ground, in a move that became the basis for suit.\textsuperscript{281} On the surface, the new platform almost certainly spells the demise of dealer dominance—once the venture gets off the ground.\textsuperscript{282} In a strange twist, however, the platform’s success depends on widespread adoption of central clearing.\textsuperscript{283} This is because central clearing provides independent assurance of creditworthiness, without which no trader would agree to transact with an anonymous counterparty.\textsuperscript{284} Yet ICE Clear Credit’s risk committee is controlled by dominant dealers, who are loath to see the platform take off. Even if it does succeed, the platform would only operate for one type of CDS, leaving more complex CDS still within the province of large dealers.\textsuperscript{285}

It remains to be seen whether ICE Clear Credit’s dealer-dominated risk committee embraces the trading platform, or whether the committee find ways of obstructing and delaying the platform’s implementation. If the latter transpires, then one casualty will be innovation. While denying rival dealers access to ICE Clear Credit inhibits competition in the dealer markets, blocking an alternate trading platform prevents a seismic transformation that could upend the dealer model altogether. Of course, innovation—in particular, disruptive innovation—is often a tradeoff for the stability of natural monopolies; where a natural monopoly facilitates parallel exclusion, innovation is sure to suffer alongside price.\textsuperscript{286}

Competition and innovation can be ethereal concepts. To crystallize the harms of parallel exclusion, we must also identify who is harmed. The vast majority of derivatives dealers are not members

\begin{itemize}
  \item \textsuperscript{281} \textit{See} supra note 84 and accompanying text.
  \item \textsuperscript{282} The platform is all-to-all and anonymous, which means that buyers and sellers transact with one another much like on an exchange, without having to go through the closed and opaque intermediary of dealers.
  \item \textsuperscript{283} \textit{See} Kentz, \textit{supra} note 280. \textit{See also} DTCC, \textit{supra} note 153 (calculating that only 27.38% of the CDS trading volume is centrally cleared).
  \item \textsuperscript{284} \textit{Id}.
  \item \textsuperscript{285} That is, single-name CDS. \textit{Id}. \textit{See also} supra note 141.
  \item \textsuperscript{286} On parallel exclusion’s capacity to harm price and innovation, see Hemphill & Wu, \textit{supra} note 6, at 1185, 1210-12.
\end{itemize}
of SwapClear, ICE Clear Credit, or ICE Clear Europe.\textsuperscript{287} This includes State Street and Bank of New York (“BNY”) Mellon, the eighth and ninth largest BHCs, respectively, as well as predecessors of the sizeable brokerage firms MF Global and Newedge, all of whom previously failed to join ICE Clear Credit.\textsuperscript{288} Exclusion from the clearinghouses primarily harms this set of dealers by suppressing their trade revenues; for they can satisfy the central clearing mandate only by paying to access clearinghouses through the current members.\textsuperscript{289}

Focusing on competitors skews our impression of the stakes, though, as a fight between trillionaires and billionaires. Each of the five dominant dealers holds just under or well over $1 trillion in assets, while State Street and BNY Mellon wield hundreds of billions.\textsuperscript{290} This is, in reductionist terms, a conflict between big banks and colossal banks, or hedge funds and colossal banks, in which neither side tends to arouse our sympathies. For this reason, the remainder of the Section examines the effects of parallel exclusion on consumers and systemic risk, so as to paint a more holistic picture. It is also helpful to bear in mind the ultimate

\textsuperscript{287} See SwapClear: Our Clearing Members, supra note 248; ICE Clear Credit: Participants, supra note 248; ICE Clear Europe: Membership, supra note 248. Citi, Goldman Sachs, JPMorgan, Bank of America, and Morgan Stanley are members of all three clearinghouses. Affiliates of HSBC are as well, but HSBC is a financial conglomerate headquartered outside the U.S. Wells Fargo, however, is a U.S.-based entity that, anomalously, holds belongs to SwapClear and ICE Clear Credit. But Wells Fargo is also a traditional commercial bank—and a goliath at that. Its commercial bank subsidiary is the fourth largest in the U.S., with assets north of $1 trillion. See OCC, 2015 Q2 REP., supra note 75, at tbl. 1. Perhaps its forays into the IRS and CDS markets are the result of leveraging (by way of tying) that dominance as a purveyor of credit.

\textsuperscript{288} See Story, supra note 87. MF Global would eventually sue the large dealers before going defunct. See MF Global Complaint, supra note 97. Newedge, having merged into Société Générale, is on SwapClear. See Daniel P. Collins, \textit{New Day for NewEdge, Or Should We Say SocGen?}, \textsc{Futures Mag}, July 11, 2014, http://www.futuresmag.com/2014/07/11/new-day-newedge-or-should-we-say-socgen; SwapClear: Our Clearing Members, supra note 248.

\textsuperscript{289} The difference in revenues is hard to measure, but perhaps Wells Fargo offers a benchmark. Its derivatives notional are $4.370 trillion for IRS and $28.5 billion for CDS, as compared to State Street’s $8.921 billion for IRS and $229 million for CDS and BNY Mellon’s $457.9 billion for IRS and 0 for CDS. See OCC, 2015 Q2 REP., supra note 75, at tbl. 2.

\textsuperscript{290} Id. Again, Wells Fargo is an outlier: as the lone trillionaire which holds membership to some clearinghouses but is not active in derivatives trading, its bread and butter is lending.
casualties of distorted competition: higher prices and less innovation.291

B. To Consumers

Parallel exclusion in derivatives markets not only inflates prices for financial products but also reduces their availability.292 Consequently, end-users of derivatives must pay more or forego hedging options altogether,293 in turn passing off increased costs to their customers. Existing literature has already examined these possibilities for the derivatives markets,294 so they will be canvassed broadly here. In short, this line of analysis unfolds according to traditional antitrust principles, which hold that exclusion constricts consumption by raising prices.295

Inverting the above proposition yields a more interesting corollary: by countering exclusion and its impulse to inflate pricing, the law spurs increased consumption—consumption, that is, of financial instruments whose valuations can fluctuate wildly.296 This might be a frightening prospect for financial regulators, who have witnessed the precipitation of scandals and crises by way of derivatives trading.297 But then, antitrust is indifferent about the fallout of increased consumption.298 Its balancing of harms and benefits tends to revolve around an economic vision of consumer welfare.299 In fact, where natural monopolies serve as gatekeepers to

291 On this point, the maxim that “antitrust protects competition, not competitors” is helpful. See Brown Shoe Co. v. United States, 370 U.S. 294, 320 (1962). This has been taken to mean, among other things, that injury to “a single competitor, standing alone, does not prove the anticompetitive effect necessary to establish antitrust injury.” HCI Technologies, Inc. v. Avaya, Inc., 241 F. App’x 115, 123 (4th Cir.2007) (citations omitted).
293 See Story, supra note 87 (“Pension funds today use derivatives to hedge investments. States and cities use them to try to hold down borrowing costs. Airlines use them to secure steady fuel prices. Food companies use them to lock in prices of commodities like wheat or beef.”).
294 See Chang, supra note 14, at 84-85.
295 In the context of parallel exclusion, see Hemphill & Wu, supra note 6, at 1210.
296 See Wilmarth, supra note 9, at 337-73.
297 Notable examples are Orange County, Jefferson County, the City of Detroit, Procter & Gamble, ALG, Lehman Brothers, and of course the financial crisis.
298 See, e.g., Brook Group, 509 U.S. (cigarettes).
public goods, antitrust does not even care whether public goods are actually good for the public. Thus, curtailing parallel exclusion means that financial regulators must step up their game in protecting consumers.  
Here again, some concrete examples are helpful. While today Southwest Airlines is one of the four largest commercial air carriers in the country, it started out as a small carrier in Texas, operating purely intra-state so as to avoid federal regulation. Two larger, federally regulated carriers sued to enjoin Southwest’s operations but lost. For passengers, Southwest has revolutionized air travel, in particular by eschewing the tedious hub-and-spoke method of operation and whetting the market for discount, no-frills airfare. By comparison, the major IRS and CDS clearinghouses have yet to accommodate the entry of smaller, more nimble dealers who do not fit the profile of dominant dealers in the U.S. markets. If more diverse members are permitted to join, then price reductions and innovations for consumers will follow.

Of course, if that happens, then the current dealers are likely to pull back from the market. As derivatives become less bespoke, they command less supracompetitive a premium.

from paying higher prices to firms that have unfairly gained or maintained market power.

300 See, e.g., 17 C.F.R. § 23.400(c) (2015); Business Conduct Standards for Swap Dealers and Major Swap Participants with Counterparties, 77 Fed. Reg. 9734, 9783 (Feb. 17, 2012). Of course, clearing and standardization of derivatives help as well, by ensuring that trades are adequately collateralized and products are not too illiquid or strange.


302 Id.


304 That is, having approximately $1 trillion in assets, dominating across multiple types of derivatives, and having been a derivatives market-maker from the very beginning. For one example, see Katy Burne, Citadel Makes Inroads into Swaps Arena, WALL ST. J., June 22, 2015, http://www.wsj.com/articles/citadel-makes-inroads-into-swaps-arena-1434997210.

C. To Systemic Risk

Opening up the pool of clearinghouse members diversifies the dealer markets, which has the added benefit of dissipating risk. The risks associated with OTC derivatives are multifaceted and played a major role in the financial crisis.\textsuperscript{306} Regulators proposed clearinghouses as one pathway to dissipate risk, by having a pool of members mutualize, or share, the risk;\textsuperscript{307} however, this process works best when clearinghouse membership is reasonably diverse.\textsuperscript{308} In the dominant IRS and CDS clearinghouses, diversification has not yet happened because dealers have managed to exclude rivals, thereby perpetuating the concentration of both notionals and risk within a small circle.\textsuperscript{309} Recognizing this propensity of exclusion, financial regulators have crafted rules governing clearinghouses that include mandating open access for dealers and restricting high capitalization requirements for members.\textsuperscript{310} Tellingly, in announcing the promulgation of one set of rules, the CFTC suggested that concentration and systemic risk are intertwined and that if more firms join clearinghouses, both sets of concerns will diminish.\textsuperscript{311}

Conflating concentration and systemic risk—and thereby intertwining antitrust and financial regulation—is not without precedent. Recently, corporate and finance legal scholars have proposed using antitrust to counter the self-entrenching impulse of financial intermediaries,\textsuperscript{312} to set a threshold for liabilities that financial institutions can amass (so as to pre-empt public bailout and the too-big-to-fail phenomenon, or “TBTF”),\textsuperscript{313} to more precisely

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{306} See, e.g., Federal Deposit Insurance Corporation, \textit{The Orderly Liquidation of Lehman Brothers Holdings Inc. under the Dodd-Frank Act}, 5 FDIC Q. No. 2 (2011).
\item \textsuperscript{307} CFTC, DCO General Provisions, \textit{supra} note 28, at 69415.
\item \textsuperscript{308} “Reasonably” because open access must still be balanced against a clearinghouse’s prerogative to screen members for risk. \textit{See} 17 C.F.R. 39.12(a)(1)(i), (iii).
\item \textsuperscript{309} See \textit{supra} notes 287-88 and accompanying text.
\item \textsuperscript{310} See 17 C.F.R. 39.12(a)(1), (a)(2)(iii).
\item \textsuperscript{311} See CFTC, DCO General Provisions, \textit{supra} note 28, at 69355 (a $50 million capitalization requirement for members “will increase the number of firms clearing swaps, which will make markets more competitive, increase liquidity, reduce concentration, and reduce systemic risk”).
\item \textsuperscript{312} Judge, \textit{supra} note 76.
\item \textsuperscript{313} Macey & Holdcroft, \textit{supra} note 274.
\end{itemize}
\end{footnotesize}
define TBTF by correlating it with monopoly power,\textsuperscript{314} and to curtail systemic risk by preventing the tying of swaps to loans.\textsuperscript{315}

Nevertheless, these are odd ways of conceptualizing antitrust; for just as antitrust does not care whether “public goods” are actually “good for the public,” it very likely does not care about ancillary benefits that are far outside its traditional focus. In other words, before we can turn to antitrust for guidance, we must define the goals of antitrust, which is an endeavor rife with pitfalls and disagreement. There is some consensus that consumer welfare is important.\textsuperscript{316} Beyond economic goals, the fight is intense over whether antitrust accommodates social and political goals, such as dissipating the political power that concentrated industries wield.\textsuperscript{317} All in all, financial stability and systemic risk seem to be too far beyond the scope of even liberal constructions of antitrust goals.\textsuperscript{318}

Further complicating any attempt to synchronize competition and finance goals is the antitrust injury rule, a requirement imposed upon private litigants to prove “injury of the type the antitrust laws were intended to prevent.”\textsuperscript{319} The antitrust injury rule has operated as a check on private antitrust actions for decades;\textsuperscript{320} it was invoked in

\begin{enumerate}
\item[315] Chang, \textit{supra} note 191.
\item[318] On the imprecise correlation between antitrust and TBTF, see Adam J. Levitin, \textit{In Defense of Bailouts}, 99 GEO. L.J. 435 (2011) (“Restricting bigness may mitigate systemic risk, but doing so by no means eliminates it because systemic risk is not solely a function of size.”); Barak Orbach & Grace Campbell Rebling, \textit{The Antitrust Curse of Bigness}, 85 S. Cal. L. Rev. 605, 651 (2012) (“the antitrust methodology examines whether markets are functioning competitively, but it has no tools to explore whether a financial institution is too big or too systemically significant to fail”).
\item[319] Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc., 429 U.S. 477, 489 (1977). The Court went on to say the following: “The injury should reflect the anticompetitive effect either of the violation or of anticompetitive acts made possible by the violation.” \textit{Id.}
\end{enumerate}
In re CDS Antitrust Litig. as well, though without success. The rule is actually the last of a three-part inquiry, whereby plaintiffs must show (i) an injury, (ii) caused by the violation of antitrust laws, (iii) that qualifies as an antitrust injury.

The above realities mean that a dealer that is excluded from the IRS or CDS clearinghouses cannot invoke the concentration of systemic risk as an injury in itself. When it comes to the weighing of anticompetitive effects and enhanced efficiencies, systemic risk almost certainly plays no role. At most, plaintiffs can hope for a nod to systemic risk as one of a broad class of harms implicated by concentration in the dealer markets, which can—but need not necessarily—be considered by the court or regulator.

Current scholarly trends do give some hope to the possibility of accounting for systemic risk. At the same time that corporate and finance law scholars are challenging their traditional paradigms, antitrust scholars are also undergoing introspection. Some are questioning how competition policy could have permitted financial institutions to amass so much power. Others question the relevance of antitrust if it cannot deal with the political and social fallout of concentration in the financial markets. While curtailing systemic risk likely has no formal place in the current rubric of exclusion, it is drawing attention as a noteworthy consequence of more rigorous application of antitrust laws.

This Section examines how the benefits of parallel exclusion offset, in whole or in part, its harms in the derivatives markets. The Section begins conventionally, with enhanced efficiencies. For parity with this Article’s comprehensive approach to harms, this Section also evaluates the argument that narrowing the pool of dealers and

321 See Hovenkamp, supra note 34, at 659.
322 Hovenkamp. See also Associated Gen. Contractors, 459 U.S. at 534 (Congress “did not intend the antitrust laws to provide a remedy in damages for all injuries that might conceivably be traced to an antitrust violation”).
324 Maurice E. Stucke, Reconsidering Antitrust’s Goals, 53 B.C. L. Rev. 551, 624 (2012) (“Antitrust’s current objectives of promoting consumer welfare and efficiency are poorly defined . . . . The quest distanced antitrust from important policy issues (such as systemic risk) and rendered antitrust less relevant. Consequently, now is the time to reconsider antitrust’s political, social, and moral concerns.”).
clearinghouse members mitigates risk. Finally, this Section provides a framework for balancing.

A. Enhanced Efficiencies

Dealer control over clearinghouses can minimize transaction costs and eliminate double markups—that is, one set of fees being charged for clearing and another set for execution (trading).325 This argument is most pertinent to vertically integrated clearinghouses, where the provider of execution services actually owns the clearinghouse. In such instances, the derivatives consumer need only transact once—with the market-maker, who can then procure clearing without having to undergo another round of bargaining. This saves the consumer the trouble of independently searching out a clearinghouse, as well as incurring separate fees for clearing.326

Clearing and execution are apt for integration because the services complement each other so well: unless an exception applies, a trade cannot be fully executed without being cleared. Bringing both spheres under common ownership minimizes the impulse of each constituent provider to inflate its prices and externalize the impact of markups to the complementary provider.327

Technically, however, it is imprecise to characterize IRS and CDS clearinghouses as vertically integrated. SwapClear is owned and operated by a subsidiary of LCH.Clearnet Group Ltd., a U.K. company.328 LCH.Clearnet Group is majority owned (57%) by the London Stock Exchange Group, with the remainder owned by its members and other exchanges.329 ICE Clear Credit and ICE Clear Europe are owned and operated by the Intercontinental Exchange, Inc. (“ICE”); these entities, too, are not majority-owned by the downstream dealers.330 To be sure, vertical integration does abound

325 See Craig Pirrong, Clearing Up Misconceptions on Clearing, REG., Fall 25 (2008).
326 See id.
327 See id.
330 See Intercontinental Exchange, Inc., Schedule 14A, 55, Mar. 30, 2015. When ICE purchased The Clearing Corporation (“TCC”) to launch its first CDS clearinghouse, see supra note 93, the venture was structured around a Cayman Islands exempted limited partnership with two classes of limited partners: one class of interests was held by ICE and its affiliates, and the other class of interests was held by shareholders of TCC, with profits split evenly between the two classes, see Letter from ICE and TCC to the SEC, Feb. 26, 2009, 7, available at https://www.sec.gov/rules/exorders/2009/ice-trust-exreq.pdf. The TCC shareholders were affiliates of Bank of America, Barclays,
in the derivatives world.\textsuperscript{331} With IRS and CDS, however, the upstream and downstream markets coalesce not by common ownership, but by the control that downstream players exert as members of the upstream facility. Thus, the mechanisms of exclusion proceed slightly differently.\textsuperscript{332}

In theory, then, because clearinghouses are not majority owned by dealers, the avoidance of extra transaction costs and double markups is not automatic. The majority owners of clearinghouses may well decide to pursue supracompetitive pricing. Yet transactional and pricing efficiencies still hold in practice because the major dealers, as clearinghouse members, will have negotiated ex ante for clearing services and factored clearing prices into the overall cost of execution charged to end-users. As they stand, the costs of clearing are fairly low and continue to decline.\textsuperscript{333} This pricing structure may be less a result of vertical integration or dealer control than the clearing functionality itself. Clearing is a regulated process in a highly regulated industry.\textsuperscript{334} If the industry were to charge excessive prices, then the central clearing mandate would be eviscerated, drawing even more intense regulatory scrutiny. The closest analog to the industry is, again, that of an infrastructure


\textsuperscript{331} CME Group, for instance, owns and operates proprietary clearinghouses that only clear products sold on CME exchanges. For criticisms, see U.S. Dept. of Justice, Review of the Regulatory Structure Associated with Financial Institutions, Comments before the Dept. of the Treasury 10 (Jan. 31, 2008). In Europe, clearing and execution silos dot the derivatives landscape. For criticisms, see Mike Reece, \textit{Competition or Consolidation?: The Outlook for Interoperability Among European CCPs}, \textit{THOUGHT} (J.P. Morgan), May 1, 2012

\textsuperscript{332} With parallel exclusion, a group of dealers are acting independently, rather than one exchange refusing to allow its clearinghouse to clear products on a rival exchange.


\textsuperscript{334} E.g., Dodd-Frank Title VIII, 12 U.S.C. 5461 et seq.
or public utility operating at close to cost (e.g., an airport); the fear of anticompetitive effects arise not so much from the utility itself but from the self-serving impulses of those who direct the utility, particularly if they also hold a dominant stake in an adjacent market (e.g., airlines).

B. **Credit Risk Mitigation**

An additional justification of exclusion, one based not an antitrust but on finance, is that it is the prerogative of clearinghouses to set risk standards.\(^{335}\) By extension, if large dealers steer the standard-setting process, that too is not inappropriate, since large dealers best understand the risks of derivatives—particularly the credit risks implicated by a democratization in trading.\(^{336}\) After all, large dealers hold most of the notionals and shoulder most of the credit risks and, therefore, rightfully play a significant role in setting clearinghouse standards.\(^{337}\)

Caveats and counterarguments abound. The markets’ embrace of standardization and transparency have alleviated some of the credit risk concerns.\(^{338}\) Further, risk is best mitigated when dispersed across a diverse pool of members, but thus far, the IRS and CDS clearinghouses have not significantly opened up.\(^{339}\) Ultimately, clearinghouses cede too much of their risk management discretion to entities clouded by strong incentives to keep trading and execution closed off to competitors.\(^{340}\)

C. **Weighing the Harms against the Benefits**

The anticompetitive effects of parallel exclusion in derivatives markets, along with the harms to consumers, outweigh the efficiencies. The propensity of large dealers to sustain wide bid/ask spread is too well-documented\(^{341}\) and the setbacks to innovation too significant\(^{342}\) to be offset by efficiencies that rest upon

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\(^{336}\) Credit risk is the risk that a counterparty will fail to honor its contractual obligations. See Feder, *supra* note 17, at 689, 722.

\(^{337}\) See *supra* note 264 and accompanying text.

\(^{338}\) See *supra* note 266 and accompanying text.

\(^{339}\) See *supra* notes 253-55 and 266-67 and accompanying text.


\(^{341}\) See *supra* Section II.B.

\(^{342}\) See *supra* Section IV.B.
dubious assumptions. Within antitrust’s traditional rubric on exclusion, this scheme should not be permitted to stand.

What animates this Article, however, is the aim of infusing the exclusion rubric with an awareness of financial risk. Systemic risk is exacerbated, by keeping clearinghouse membership closed and the dealer oligopoly impermeable, far more than credit risk mitigated by virtue of the same behavior. This tips the scales even more dramatically against parallel exclusion.

However, accounting for extra-antitrust concerns such as financial risk may further muddle an already confused framework. The assessment of market power has been fraught with controversy, and anticompetitive effects and efficiencies have been subjected to similarly intense debate over antitrust’s objectives. Piling on financial risk will not simplify the enforcer’s task of weighing the harms and the gains. If anything, it vitiates an institutional design that has partitioned competition and financial stability as competences for antitrust and financial regulators, respectively.

Of course, the current institutional design need not be sacrosanct. The failure of both sets of regulators to head off the financial crisis suggests that the regulatory design is too rigid to anticipate and correct for its own blindspots. This track record does not bode well for the OTC derivatives markets. Even if monopolization jurisprudence develops to the point of curtailing parallel exclusion, today’s dominant dealers will exit the markets, and new hedging strategies will arise in the interstices between

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343 See supra notes 328-38 and accompanying text.
344 See supra notes 34, 56.
345 For an especially poignant description of the quandary, see Richard A. Posner, Reflections on Judging 6 (2013) (“What is reasonable or sensible will often depend on moral feelings, common sense, sympathies, and other ingredients of thought and feeling that can’t readily be translated into a weighing of measurable consequences.”). Due perhaps to the complexity of its substance, antitrust has had a history of obfuscating procedure. See, e.g., Twombly, 550 U.S. (pleadings); Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio Corp., 475 U.S. 574 (1986) (summary judgment).
346 The boundaries are somewhat fluid though. Financial regulators are empowered to consider the effects upon competition in their rulemaking. The literature on regulatory capture proffers antitrust as a countermeasure to wrest control from interested regulators.
347 For example, as traditional financial intermediaries faced heightened regulation, risk functions were outsourced to less regulated intermediaries in the capital markets. Charles K. Whitehead, Reframing Financial Regulation, 90 B.U. L. Rev. 1, 16-20 (2010); Kathryn Judge, Fragmentation Nodes: A Study in Financial Innovation, Complexity, and Systemic Risk, 64 Stan. L. Rev. 657, 665-67 (2012). Astonishingly, even where change has been slow and incremental, regulators have failed to exhibit the imagination necessary to rein in the unintended consequences. See, e.g., Omarova, supra note 220.
financial regulation and antitrust. After all, derivatives themselves were innovations responding to the desire of end-users to transfer or modulate market risks in novel ways.

Market definition, however, may offer a way of thwarting the possibility that new alternatives to derivatives will precipitate another crisis. Anticipating substitute products is a key part of market definition; antitrust regularly contends with competing narratives about substitutability and cross-elasticities in drawing the relevant market. Financial regulators, however, are often slow to predict the unregulated spaces that regulated firms turn to. By plodding through a rigorous market definition/market share analysis for derivatives and their substitutes, regulators may be able to chase down the market-makers for new products and at least arrest the velocity with which unregulated markets expand. This more nimble, functional approach can help regulators overcome their institutional predispositions to detect the trends linking disparate products and players.

VI. CONCLUSION

One glaring deficiency of the traditional, “first-generation” approach toward monopolization is its insistence on anticompetitive conduct by a single firm. The inability of antitrust to recognize a “second generation” of monopolization harms from parallel exclusion consigns the OTC derivatives markets to a degree of concentration that imperils competition, consumers, and systemic risk.

The dominant derivatives dealers wield the market power to harm competition. Today, these dealers drive the standard-setting processes of derivatives clearinghouses, natural monopolies in the upstream market. Large dealers can independently decide to adopt risk guidelines that prevent their rivals from joining clearinghouses—which, due to the indispensability of the clearing function to trading, raises the rivals’ costs. This is but the latest in a

348 See supra note 305.
349 See Hu, supra note 17, at 1465-67.
350 See HOVENKAMP, supra note 34, at 110-18.
352 More research must be done to flesh out how this might unfold.
pattern of recidivist exclusion characterizing the dealer oligopoly. In the past, large dealers have resisted market and regulatory transformations by colluding to stifle innovations in both clearing and trading.

Market power in the clearing and trading markets is made manifest by a rigorous application of the traditional market definition/market share paradigm. For all its infirmities, this paradigm is useful as a way of illuminating blindspots in financial regulation. Of course, this blending of antitrust principles and financial regulation must contend with larger questions on institutional design and the goals of antitrust. This Article anticipates that addressing those issues can help slow the speeds at which financial complexity outpaces regulation.