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ARTICLES

ON DERIVATIVES MARKETS AND SOCIAL WELFARE: A THEORY OF EMPTY VOTING AND HIDDEN OWNERSHIP

Jordan M. Barry,[*] John William Hatfield,[**] and Scott Duke Kominers[†]

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*I*N the past twenty-five years, derivatives markets have grown expo-
nentially. Large, modern derivatives markets increasingly enable in-
vestors to hold economic interests in corporations without owning vot-
ing rights, and vice versa. This leads to both empty voters—investors
whose voting rights in a corporation exceed their economic interests—
and hidden owners—investors whose economic interests exceed their
voting rights.

   We present formal analysis that shows how, when financial markets
are opaque, empty voting and hidden ownership can render financial
markets unpredictable, unstable, and inefficient. By contrast, we show
that when financial markets are transparent, empty voting and hidden
ownership have dramatically different effects: they follow predictable
patterns, encourage stable outcomes, and promote efficiency. Our anal-
ysis lends insight into the operation of securities markets in general and
derivatives markets in particular. It also provides a new justification for
a robust mandatory disclosure regime and facilitates analysis of pro-
posed substantive securities regulations.*

INTRODUCTION

In late 2005, Henderson Land made an offer to acquire all outstanding shares of Henderson Investment, its partially owned subsidiary, for a substantial premium.[1] Henderson Investment's minority shareholders reacted favorably,[2] and the transaction appeared highly likely to be consummated.[3] Buoyed by Henderson Land's offer, the market price of Henderson Investment shares rose forty-four percent.[4]

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[1] See Jonathan Li, HK Henderson Invest Hldrs Reject 2nd Buyout Bid, Dow Jones Int'l News, Jan. 20, 2006, available at Factiva, Doc. No. DJI0000020060120e21k000hg; Henderson Land Development Co. Ltd. & Henderson Investment Ltd., Joint Announcement: Proposed Privatisation of Henderson Investment Ltd. by Henderson Land Development Company Limited (Nov. 18, 2005), http://www.hilhk.com/en/pdf/investor/circulars/2005/Ann20051109.pdf. The offer allowed Henderson Investment shareholders to exchange 2.5 shares of Henderson Investment for one share of Henderson Land. Henderson Land Development Co.: Bid Is Sweetened for Proposal to Take Investment Unit Private, Wall St. J., Dec. 13, 2005, available at Factiva, Doc. No. J000000020051213e1cd0001v. We are grateful to Henry T.C. Hu and Bernard Black for unearthing this example, as well as many others that we discuss in this paper. See Henry T.C. Hu & Bernard Black, Equity and Debt Decoupling and Empty Voting II: Importance and Extensions, 156 U. Pa. L. Rev. 625, 671 tbl.1 (2008) (listing eighty-two decoupling examples from the years 1988–2008).

[2] Henry T.C. Hu & Bernard Black, The New Vote Buying: Empty Voting and Hidden (Morphable) Ownership, 79 S. Cal. L. Rev. 811, 834 (2006).

[3] Florian Gimbel & Francesco Guerrera, Henderson Stock Lending Fears—Unusually Heavy Volumes of Borrowed Shares Ahead of Decisive Vote—Critics Claim the Practice Is a Form of Market Abuse, Fin. Times (Asia), Feb. 15, 2006, at 15, available at Factiva, Doc. No. FTFT000020060215e22f0000u (stating that Henderson Land's proposal "was surprisingly blocked by shareholders").

[4] Patricia Cheng, Hedge Funds Find Loophole in H.K.—Voting Rules Enable Investors to Disguise Their Intentions, Int'l Herald Trib., Feb. 16, 2006, at 1R, available at Factiva, Doc. No. INHT000020060216e22g0003b.

In January 2006, however, market watchers were surprised to discover that Henderson Investment's minority shareholders had rejected Henderson Land's offer.[5] According to reports, a lone hedge fund surreptitiously acquired enough Henderson Investment shares to block the transaction.[6]

What transformed this development from merely surprising to downright troubling was that this same hedge fund had also placed large bets that the price of Henderson Investment's shares would drop.[7] As a result, it stood to profit if Henderson Investment decreased in value. In other words, the hedge fund blocked the takeover because the takeover was *good* for Henderson Investment and the hedge fund wanted to make Henderson Investment *less* valuable.

This is unusual because the same shares that gave the hedge fund the right to vote on Henderson Investment's future also gave it a multimillion-dollar economic interest in Henderson Investment. These voting rights ("control rights") and economic interests ("economic rights" or "ownership rights") typically come bound together with each share of stock. The traditional justification for packaging these rights together is that ownership rights encourage shareholders to exercise their control rights in ways that will maximize the corporation's value.[8]

But, as the Henderson Investment example shows, even if economic and control rights are initially fused, they may later be separated from each other. This phenomenon, known as decoupling, frequently entails the use of financial derivatives,[9] and the explosive growth of financial derivatives markets has fueled a surge in decoupling behavior.[10] Decoupling can result in empty voting, in which a shareholder's control rights exceed her ownership rights. In some cases, shareholders can even have a negative economic interest, like the hedge fund did in the Henderson

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[5] Gimbel & Guerrera, supra note 3, at 15. A majority of votes were cast in favor of the transaction, but not enough to satisfy the stringent supermajority requirement. Hu & Black, supra note 2, at 834.

[6] Alex Frew McMillan, Hong Kong Studying Voting Issues on Borrowed Shares, Infovest21 News, Jan. 25, 2006, available at Factiva, Doc. No. INFNSP0020080429e21p0004t.

[7] See id.

[8] See, e.g., Sanford J. Grossman & Oliver D. Hart, One Share-One Vote and the Market for Corporate Control, 20 J. Fin. Econ. 175, 175–78 (1988).

[9] Derivatives are securities whose value depends on (that is, derives from) other securities. Stephen A. Ross et al., Corporate Finance 695 (6th ed. 2002). For detailed discussion and examples, see infra Sections I.B–C.

[10] See Hu & Black, supra note 1, at 629, 661 tbl.1; see also infra Sections I.B–C.

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Investment example.[11] Conversely, decoupling can also lead to hidden ownership, in which a shareholder's ownership rights exceed her control rights.[12]

Decoupling incidents have cast a long shadow over financial markets worldwide: They have generated front-page headlines,[13] produced cloak-and-dagger corporate takeover attempts,[14] and led to the ousters of CEOs at major banks.[15] Regulators worldwide have scrambled to respond.[16]

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[11] Hu & Black, supra note 2, at 815, 834‑35; see also Shaun Martin & Frank Partnoy, Encumbered Shares, 2005 U. Ill. L. Rev. 775, 787‑804 (2005) (referring to this phenomenon as encumbered shares).

[12] Hu & Black, supra note 2, at 815; see also Martin & Partnoy, supra note 11, at 804‑05.

[13] See, e.g., Simon Targett, Top Pension Funds Plan Securities Lending Code, Fin. Times (London), June 14, 2004, at 1, available at Factiva, Doc. No. FTFT000020040614e06e00064; John Waples, Ritblat Hits at CSFB and Laxey for Vote 'Conspiracy,' Sunday Times (London), July 21, 2002, § 3, at 1.

[14] See, e.g., Katharina Bart, Backlash for Swiss Bank: Politicians Consider ZKB Privatization Amid Options Dispute, Wall St. J. (Sept. 18, 2007), http://online.wsj.com/article/SB119 008035885030743.html; Jacob Greber, Reinsurer Rejects Bid by Scor of $2.5 Billion, Int'l Herald Trib., Feb. 20, 2007, at 16; Adam Jones & Haig Simonian, Converium Accepts New Scor Bid, Fin. Times (Eur.), May 11, 2007, at 17, available at Factiva, Doc. No. FTFT000020070511e35b00002; Haig Simonian, Victory Jitters Strike Swiss Industrialists: Loopholes in Disclosure Rules Allow Austrian Corporate Raider to Build Large Stakes in Its Targets by Stealth, Fin. Times (London), Mar. 19, 2007, at 24, available at Factiva, Doc. No. FTFT000020070319e33j0002w.

[15] See, e.g., Haig Simonian, ZKB Head Quits in Row on Disclosure, Fin. Times (London), May 8, 2007, at 24, available at Factiva, Doc. No. FTFT000020070508e35800038. Decoupling incidents have also led to police raids. See Katie Reid, ZKB, Deutsche Offices Raided by Swiss Watchdog, Reuters (May 24, 2007), http://www.reuters.com/article/2007/ 05/24/idUSL2463554520070524.

[16] To take a few examples, these jurisdictions include the United States, Canada, the United Kingdom, Switzerland, Hong Kong, Australia, Italy, and the Netherlands. For the United States, see, for example, Order Approving Proposed Rule Change to Amend NYSE Rule 452, Securities Act Release No. 34-60215, 96 SEC Docket 654, 654‑60 (CCH) (Feb. 1, 2010) (restricting brokers' ability to vote shares they do not beneficially own); David J. Berger & Richard Cameron Blake, 2009 Proxy Season Update, WSGR Alert (Wilson, Sonsini, Goodrich & Rosati, Palo Alto, Cal.), Apr. 2009, at 2, available at http://www.wsgr.com/ publications/pdfsearch/wsgralert_proxyseason.pdf ("Institutional investors have urged the SEC to adopt the proposed amendment, citing . . . . the CVS Caremark 2007 director election and Washington Mutual 2008 director election . . . ."). For Canada, see, for example, Janet McFarland, Hedge Funds Praise OSC Ruling on Sears, Globe & Mail (Can.), Sept. 15, 2006, at B5. For the United Kingdom, see, for example, UK Takeovers: Changes to the Takeover Code Disclosure Regime, Weil Briefing (Weil, Gotshal & Manges, London, Eng.), Mar. 2010, at 1‑4, available at http://www.weil.com/files/Publication/2bf5fec7-4526-4a91-ad5a-5c8b048c23f9/Presentation/PublicationAttachment/e89dcacf-22f1-4109-8f2e-788b5288117f /Changes%20to%20takeover%20disclosure%20regime_rep.pdf (discussing new disclosure rules for cash-settled derivatives and other changes to the UK's disclosure regime). For Switzerland, see, for example, Dieter Gericke & Emanuel Dettwiler, Disclosure of Share-

Formulating a suitable response has proven challenging. Although some decoupling incidents are quite troubling, there are other instances in which decoupling seems beneficial. For example, if managers misbehave, activist shareholders can use decoupling strategies to acquire additional voting interests more cheaply than would otherwise be possible.[17] These shareholders can then use their additional (empty) voting power to pressure managers to improve their behavior.[18]

Regulators need a way to distinguish between beneficial and problematic decoupling, or else they risk throwing the baby out with the bathwater.[19] Typically, regulators and others use models to understand markets and evaluate policy options. Hence, a good model is key to for-

holdings: Tightened Requirements, Homburger Bulletin (Homburger, Zurich, Switz.), Nov. 30, 2007, available at http://www.homburger.ch/fileadmin/publications/HBDISCSH_01.pdf (discussing 2007 amendments); Alexander Vogel & Andrea Sieber, Disclosure Rules in Switzerland: Recent Developments, US.PracticalLaw.Com, http://us.practicallaw.com/0-502-1078 (last visited Mar. 30, 2013) (discussing 2007 and 2011 amendments expanding Swiss disclosure laws in response to decoupling incidents). For Hong Kong, see, for example, Deacons, Hong Kong: Disclosure of Interests in Securities of Hong Kong Listed Companies: SFC Consultation Conclusions, HG.org (Oct. 24, 2005), http://www.world servicesgroup.com/publications.asp?action=article&artid=850 (discussing a 2005 Hong Kong Securities and Futures Commission proposal that would require increased disclosure of derivatives positions); Slaughter & May, A Guide to the Securities and Futures Ordinance 1, 17-18 (Apr. 2003), available at http://www.slaughterandmay.com/media/39272/ a_guide_to_the_securities_and_futures_ordinance.pdf (discussing earlier changes to Hong Kong regulatory rules requiring increased disclosure of derivatives positions). For Australia, compare Glencore Int'l AG v Takeovers Panel (2006) 151 FCR 77, 80-85, 97-98 (Austl.) (reviewing the Australian takeover panel's response to Glencore's decoupling behavior), with Corporations Amendment (Takeovers) Act 2007 (Cth) sch 1 (Austl.) (changing the law in response to the court's ruling). For Italy, see, for example, Italy's Consob Rules IFIL Not Obliged to Bid for Fiat, but Swap Deal Probed, AFX News (Feb. 8, 2006, 10:04 AM), http://www.finanznachrichten.de/nachrichten-2006-02/2015831-italy-s-consob-rules-ifil-not-obliged-to-bid-for-fiat-but-swap-deal-probed-020.htm (discussing a decoupling incident that sparked investigations by Italy's securities regulator and Italian prosecutors). For the Netherlands, see, for example, Jan Willem van der Staay, Public Takeovers in the Netherlands, Global M&A Yearbook 2000, Corp. Fin. 83 (2000) (discussing decoupling incidents and Dutch regulators' responses).

[17] See, e.g., Laxey Gets Digging in Switzerland, FT Alphaville (Nov. 2, 2007, 9:26 AM), http://ftalphaville.ft.com/2007/11/02/8581/laxey-gets-digging-in-switzerland/ (describing one example of investors employing an empty voting strategy to influence management).

[18] See id.

[19] See infra Section I.E (discussing other potential benefits of decoupling).

mulating an appropriate regulatory response to decoupling.[20] A bad model, like a cloudy lens, will produce a distorted picture.[21]

The primary tool that economists use to analyze markets is the competitive equilibrium model.[22] This model chiefly focuses on prices. The heart of the competitive equilibrium model is the idea that there is a set of prices at which the market will clear. In other words, if the price of each item is set at the "right" level, everyone who wishes to purchase or sell anything may do so.

Unfortunately, the competitive equilibrium model is unsuitable for analyzing decoupling. We show that corporate shareholders' control rights, which give shareholders the power to affect corporate behavior, can render competitive equilibria inefficient or nonexistent. Worse, when control rights can be bought and sold independently of ownership rights—as modern derivatives markets increasingly allow—we show that competitive equilibria essentially never exist.

We propose an alternative model, built on the concept of the "core outcome."[23] The hallmark of a core outcome is that no group of actors can change its behavior in a way that makes the group as a whole better off. We demonstrate that core outcomes have numerous attractive properties that make them well-suited for analyzing decoupling: In contrast with competitive equilibria, core outcomes always exist and are always efficient. They can always be achieved through voluntary trading, and are stable—once the market reaches a core outcome, it should remain there. Finally, core outcome analysis enables us to predict both the types of portfolios that actors will hold and the decisions that firms will make. Predicted portfolios resemble the diversified portfolios that most inves-

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[20] See Kurt Lewin, Field Theory in Social Science 169 (Dorwin Cartwright ed., 1951) ("[T]here is nothing so practical as a good theory.").

[21] Cf. Werner Heisenberg, Physics and Beyond: Encounters and Conversations 63 (Ruth Nanda Anshen ed., Arnold J. Pomerans trans., 1971) ("It is the theory which decides what we can observe." (quoting Albert Einstein)); John Maynard Keynes, The General Theory of Employment Interest and Money 383 (1936) ("[T]he ideas of economists . . . both when they are right and when they are wrong, are more powerful than is commonly understood. . . . Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist.").

[22] See, e.g., Robert J. Michaels, Transactions and Strategies: Economics for Management 151 (2010) ("The perfectly competitive model is one of our most important analytical tools.").

[23] This concept is adapted from a cooperative game theory concept known as "the core." See Roger B. Myerson, Game Theory: Analysis of Conflict 427–36 (1991).

tors hold in the real world.[24] All of these features persist even when ownership and control rights can be bought and sold separately.

Taken together, our results illuminate the effects of large derivatives markets. By effectively separating ownership and control rights, large, opaque derivatives markets can render financial markets unpredictable, unstable, and inefficient. Our analysis shows how these negative consequences can be avoided if major market actors have knowledge of each other's economic and control rights.[25] Our analysis therefore provides a strong justification for a comprehensive mandatory disclosure regime for securities markets, including derivatives markets.[26] Ours is the first formal model to demonstrate these phenomena. It also provides a powerful lens for examining substantive measures proposed to address decoupling.

Part I of this Article provides background on decoupling and financial derivatives. Part II explains the concept of competitive equilibrium, catalogs its failings when applied to decoupling, and illustrates how derivatives markets greatly exacerbate those failings. Part III presents the core outcome, our proposed alternative to competitive equilibrium, and demonstrates its key properties. Part IV examines the real-world implications of these models. It explores the consequences of core outcome analysis for several areas of policy interest, including derivatives markets and securities regulation. Part V extends our analysis by investigating the effects of relaxing some of these models' assumptions. Throughout the Article, we include citations to a companion paper that contains formal proofs of our results.[27]

I. THE CLASSICAL THEORY AND THE MODERN WORLD

This Part begins by briefly presenting the traditional efficiency justification for giving voting rights to corporate shareholders. It then illustrates

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[24] See William N. Goetzmann & Alok Kumar, Equity Portfolio Diversification, 12 Rev. Fin. 433, 433–35 (2008) (discussing portfolio diversification by U.S. investors).

[25] See Companion Paper, infra note 27, at 3.2.

[26] See infra Section IV.D. The lack of disclosure and the opacity of many decoupling transactions have also hampered regulators' attempts to analyze how market actors currently utilize decoupling strategies. See, e.g., Eur. Sec. & Mkts. Auth., Call for Evidence: Empty Voting (Sept. 14, 2011), available at http://www.esma.europa.eu/system/files/2011_288.pdf (asking market participants to provide information about empty voting incidents).

[27] See Jordan M. Barry et al., Shareholder Decisionmaking in the Presence of Empty Voting and Hidden Ownership (Aug. 25, 2013), available at scottkom.com/articles/ Barry_Hatfield_Kominers_Empty_Voting.pdf [hereinafter Companion Paper].

how derivatives enable investors to separate ownership and control rights. It proceeds to discuss how the rapid growth of derivatives markets has fueled decoupling behavior, undermining the traditional efficiency justification for shareholder voting rights and challenging securities regulators. It concludes by exploring how decoupling can nonetheless benefit society.

A. The Classical Theory

The interests of shareholders are central to U.S. corporate law. Corporate managers have fiduciary duties to the corporation's shareholders.[28] Managers are overseen by the corporation's board of directors.[29] Directors are elected by the corporation's shareholders[30] and, like managers, directors are legally obligated to further shareholders' interests.[31] In addition, shareholders must directly approve certain major corporate actions, such as liquidations,[32] large asset sales,[33] and mergers.[34]

It is not immediately obvious why shareholder interests deserve so much attention.[35] Shareholders are not the only people that the corporation affects; its choices can have serious effects on its employees,[36] creditors,[37] and customers,[38] as well as society at large.[39] Why should the interests of shareholders be paramount?

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[28] Dodge v. Ford Motor Co., 170 N.W. 668, 684 (Mich. 1919); see also N.Y. Bus. Corp. Law § 717(b) (Consol. 1983 & Supp. 2013); 15 Pa. Cons. Stat. Ann. § 1717 (West 1995); Stephen M. Bainbridge, Corporation Law and Economics 410-17 (2002).

[29] Bainbridge, supra note 28, at 194-95.

[30] See, e.g., Del. Code Ann. tit. 8, § 211(b) (2011).

[31] *Dodge*, 170 N.W. at 684.

[32] See, e.g., Del. Code Ann. tit. 8, § 275(b) (2011).

[33] See, e.g., id. § 271(a).

[34] See, e.g., id. § 251(c).

[35] See Edwin M. Epstein, The Good Company: Rhetoric or Reality? Corporate Social Responsibility and Business Ethics Redux, 44 Am. Bus. L.J. 207, 212–16 (2007). Some other countries' laws place relatively less importance on shareholders' interests. See Terence L. Blackburn, The *Societas Europea*: The Evolving European Corporation Statute, 61 Fordham L. Rev. 695, 744–45 (1993) (discussing the status of workers' interests in European corporate structures).

[36] Bainbridge, supra note 28, at 466.

[37] See Sudheer Chava et al., Managerial Agency and Bond Covenants, 23 Rev. Fin. Stud. 1120, 1121–22 (2010) (considering how corporate activities affect bondholders and bondholders' responses).

[38] See Shawn L. Berman et al., Does Stakeholder Orientation Matter? The Relationship Between Stakeholder Management Models and Firm Financial Performance, 42 Acad. Mgmt. J. 488, 490 (1999).

[39] See E. Merrick Dodd, Jr., For Whom Are Corporate Managers Trustees?, 45 Harv. L. Rev. 1145, 1162 (1932); E. Merrick Dodd, Jr., Is Effective Enforcement of the Fiduciary Duties of Corporate Managers Practicable?, 2 U. Chi. L. Rev. 194, 205 (1935).

The classic justification for shareholders' control rights, and for their centrality in corporate law more generally, stems from shareholders' economic interest in the corporation. Shareholders, by virtue of their share ownership, are entitled to whatever profits remain after the corporation satisfies its other obligations.[40] As the residual claimants of the firm's assets,[41] they are, in a sense, the economic "owners" of the firm; they ultimately reap the benefits, or bear the costs, of any change in the firm's value. Accordingly, shareholders want to maximize the corporation's value,[42] and making shareholders' interests central encourages managers and directors to do so.[43] A long line of legal and economic scholarship supports and reinforces this view.[44] Critically, this whole line of argument rests on the correspondence between shareholders' economic interests and their voting interests.[45] But, in the last few decades, the connection between shareholders' economic and voting interests has become increasingly frayed because of rapid growth in derivatives markets.

B. Decoupling and Derivatives

A derivative is a security whose value derives from the value of another security or securities.[46] This abstract concept can be easily understood through a simple example. Consider a contract that provides for the sale of a specified quantity of something—for example, a computer, a bag of potatoes, or a barrel of oil—at a particular price on a set day in

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[40] Bainbridge, supra note 28, at 469–70; Frank H. Easterbrook & Daniel R. Fischel, The Economic Structure of Corporate Law 67–70 (1991).

[41] This assumes that the corporation is not in bankruptcy; then, creditors' interests become paramount. Bainbridge, supra note 28, at 431.

[42] Id. at 469 n.16.

[43] Some have questioned whether it would be better to prioritize only some shareholders' interests, such as long-term owners. See, e.g., Lynne L. Dallas, Short-Termism, the Financial Crisis, and Corporate Governance, 37 J. Corp. L. 265, 276-77 (2012).

[44] See, e.g., Bernard Black & Reinier Kraakman, A Self-Enforcing Model of Corporate Law, 109 Harv. L. Rev. 1911, 1945–46 (1996); Frank H. Easterbrook & Daniel R. Fischel, Voting in Corporate Law, 26 J.L. & Econ. 395, 403 (1983); Grossman & Hart, supra note 8, at 175; Milton Harris & Artur Raviv, Corporate Governance: Voting Rights and Majority Rules, 20 J. Fin. Econ. 203, 226-28 (1988).

[45] See Martin & Partnoy, supra note 11, at 788.

[46] Ross et al., supra note 9, at 695.

the future. Such a contract is known as a futures contract[47] and the item being sold is termed the underlying asset, or simply the underlying.[48] The value of the futures contract directly depends on the value of the underlying.[49] If the underlying is a security—such as a share of Microsoft stock—then the futures contract is a derivative.[50]

For example, consider a futures contract that provides for the sale of one share of Microsoft stock in three months' time for a sale price of $10. Since Microsoft stock trades freely in public markets, the value of that futures contract depends on the value of Microsoft stock. Three months from now, if shares of Microsoft stock are being bought and sold for $14, a contract to buy a share for only $10 is a valuable asset;[51] the stock purchaser will pay $10 for stock that she can immediately sell for $14.[52] On the other hand, if Microsoft stock is trading at $6 per share, the obligation to buy at $10 is a costly liability;[53] the stock purchaser must pay $10 for something that she could easily buy for only $6.[54] Thus, the value of the futures contract depends on, and derives from, the value of Microsoft stock.

Now suppose that Alice has ten shares of Microsoft stock, currently worth a total of $100. Alice then enters into a futures contract with Bob. Pursuant to that contract, Bob agrees to buy ten shares of Microsoft stock from Alice in three months for a total price of $100. Consider what happens if the price of Microsoft stock increases from $10 a share to $20 a share. The total value of Alice's Microsoft shares increases from $100 to $200. However, Alice gets no benefit; pursuant to the terms of her contract with Bob, she must still sell her shares to Bob for $100. Similarly, if the price of Microsoft shares drops from $10 to $5, Alice is not hurt—she still gets to sell her shares to Bob for $100. As long as Alice and Bob honor their contract, Alice has no economic interest in Microsoft stock and she does not care about its value.

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[47] Depending on the specifics, such a contract may be a similar derivative known as a forward contract. The differences between forwards and futures are generally irrelevant for our purposes. See id. at 695–702.

[48] Id. at 695.

[49] Id.

[50] Id.

[51] Similarly, the obligation to sell Microsoft shares at $10 is a costly liability.

[52] This neglects transaction costs, taxes, and so forth. See R. H. Coase, The Problem of Social Cost, 3 J.L. & Econ. 1, 15 (1960).

[53] Alternatively, the right to sell Microsoft at $10 is valuable.

[54] Equivalently, she must pay $10 for stock with an objective value of only $6.

But while Alice has no economic interest in her ten Microsoft shares, for the next three months, she remains the legal owner of those shares and retains all the accompanying legal rights, including the right to vote those shares. When an actor's control rights exceed her economic rights, like Alice's do here, that actor is termed an empty voter, and the act of exercising those control rights is referred to as empty voting.[55] The phrase "empty voting" derives from the idea that the shareholder's vote has been emptied[56] of the economic consequences it would typically have for her.[57]

In some cases, an empty voter will have an outright *negative* economic interest in the corporation. In these instances, the empty voter actively wants the corporation to decrease in value. For instance, suppose that Alice enters into a futures contract with Bob in which she promises to deliver more shares of Microsoft stock than she currently owns: From Alice's perspective, the futures contract is just an obligation to deliver Microsoft shares at some specified point in the future. So long as she acquires the necessary shares before she is obligated to deliver them to Bob, all will be well. The most common means of acquiring Microsoft shares is to purchase them in the market. Thus, the cost to Alice of fulfilling the contract is the market price of Microsoft stock;[58] the lower the market price of Microsoft stock, the less it will cost Alice to fulfill her obligations and the better off she will be.

An example helps illustrate this point. Suppose that Alice initially owns five Microsoft shares, each worth $10, and agrees to sell Bob ten Microsoft shares in three months for $100. If the value of a Microsoft share increases from $10 to $15, the total value of Alice's five original Microsoft shares increases from $50 to $75, a gain of $25. However, the total value of the shares that Alice must deliver to Bob under the futures

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[55] See Hu & Black, supra note 2, at 815; see also Martin & Partnoy, supra note 11, at 780 (using the term "economically encumbered" shares).

[56] Relative to a shareholder with identical voting power and no other interest in the corporation, the shareholder has a reduced economic interest; she has less "skin in the game," so to speak.

[57] Hu & Black, supra note 2, at 815. To be clear, her vote need not be emptied of all economic consequences. Alternatively, if she has a negative economic interest in the corporation, her vote still holds economic consequences, but they run in the opposite direction of what one would ordinarily expect. See id.

[58] This is true even if Alice already owns the underlying securities, because, absent her contractual obligation to give them to Bob, Alice could sell them for their market price. Cf. Hal R. Varian, Intermediate Microeconomics: A Modern Approach 327 (5th ed. 1999) (discussing opportunity cost).

contract increases from $100 to $150, a gain of $50. Since Alice's obligations under the contract have increased by $50 while the value of her holdings has only increased by $25, the rise in Microsoft's stock price has made her $25 worse off.

On the other hand, consider Alice's position if Microsoft's share value declines to $5. The total value of Alice's five original Microsoft shares drops from $50 to $25, a loss of $25. However, the total value of the shares that Alice must deliver to Bob under their contract drops from $100 to $50. Thus, Alice is now better off; although the value of her holdings decreases by $25, the cost of fulfilling her contractual obligations to Bob decreases by an even larger amount ($50). Given Alice's incentives, she should consistently vote against Microsoft's interests—to the chagrin of Microsoft's other shareholders.[59]

Thus far we have focused on Alice; what of Bob's position? Once the futures contract is made, Bob has an economic interest in Microsoft shares, but not a voting interest: Under the terms of the contract, he will receive Microsoft shares. Thus, he reaps the benefit or bears the loss of any change in those shares' value. But, until the end of the contract, Bob will not actually own any Microsoft shares, and therefore will not be entitled to vote in shareholder elections. Thus, in contrast to Alice, Bob's economic interest in Microsoft exceeds his voting interest.

When a person's economic rights exceed his control rights, as Bob's do in the examples above, it is referred to as hidden ownership.[60] This terminology stems from the fact that, in many cases, acquiring a specified threshold of voting power in a corporation creates an obligation to disclose one's interest.[61] Because Bob has no voting rights, he may avoid these disclosure obligations and his economic ownership will remain hidden from public view.

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[59] Cf. Bainbridge, supra note 28, at 469 n.16 (noting that shareholders generally share the desire to maximize firm value).

[60] Hu & Black, supra note 1, at 629.

[61] See, e.g., Sec. Exch. Comm'n, Form 3: Initial Statement of Beneficial Ownership of Securities, available at http://www.sec.gov/about/forms/form3data.pdf (last visited July 5, 2013) ("This Form must be filed by . . . any beneficial owner of greater than 10% of a class of equity securities registered under Section 12 of the Exchange Act, as determined by voting or investment control over the securities . . . ."); Sec. Exch. Comm'n, Schedule 13D, http://www.sec.gov/answers/sched13.htm (last visited July 5, 2013) (explaining that beneficial owners possessing five percent or more of the voting power of a class of a company's equity securities must file Schedule 13D).

Sometimes a hidden owner can easily acquire or control a voting interest proportional to his economic interest. Such an interest is termed morphable, as it may "morph" into an interest with both economic and voting rights.[62] For example, suppose Bob and Alice enter into a futures contract under which Bob will purchase Alice's Microsoft shares for a particular price on a particular date. Alice informally agrees that, until that date, she will vote the shares in accordance with Bob's preferences.[63] Bob's position constitutes hidden and morphable ownership.[64]

C. The Scope and Structure of Derivatives Markets

The examples above provide clear illustrations of how economic and control rights may be decoupled, but they are by no means the only ways. Modern finance offers a multitude of ways for an investor to hold divergent interests with respect to the economics and control of a corporation: She can engage in short sales.[65] She can trade call or put options on the company's stock.[66] She can trade credit default swaps on the company's debt.[67] The list goes on.[68] These scenarios vary significantly,[69] but they all arise through the use of derivatives.[70]

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[62] Hu & Black, supra note 2, at 815–16.

[63] Note that Alice would likely consent—because she already owns the shares she has promised to deliver, she has no economic interest in Microsoft; thus, she only cares about Microsoft shareholder votes to the extent they affect her other interests. See infra notes 88–89 and accompanying text.

[64] Hu & Black, supra note 2, at 815–16. Alice would be an empty voter.

[65] An investor who sells short borrows a security, and then sells it. The investor later buys an identical security to give back to the lender. The investor profits if the security's price drops after she sells it. Ivo Welch, Corporate Finance 167 (2d ed. 2011).

[66] A call (put) option conveys the right, but not the obligation, to buy (sell) a specified quantity of another security on a particular date at a specified price, known as the strike price. If the strike price is lower (higher) than the market price for the underlying security, the option can be quite valuable. Fischer Black & Myron Scholes, The Pricing of Options and Corporate Liabilities, 81 J. Pol. Econ. 637, 637–38 (1973); see also Martin & Partnoy, supra note 11, at 789.

[67] A credit default swap resembles an insurance policy against default by a specified borrower: The buyer receives a payment from the seller if the borrower fails to make payments on a particular debt obligation. Since buyers only receive payment if the borrower defaults, the value of the credit default swap closely (and inversely) depends on the value of the borrower's debt and equity. See Frank Partnoy, Infectious Greed: How Deceit and Risk Corrupted the Financial Markets 372–73 (2009).

[68] See Martin & Partnoy, supra note 11, at 789–92 (collecting examples).

[69] Id. (discussing incentives of shareholders with varied derivatives holdings).

[70] To be clear, we do not mean to imply that decoupling requires the use of derivatives. See Ian Ayres & Joe Bankman, Substitutes for Insider Trading, 54 Stan. L. Rev. 235, 236–39

For many years, the derivatives market was quite small compared to the public market for stocks. Thus, it was generally impractical to use derivatives to acquire (or sell) significant economic or voting interests in a public company.[71] Over the past few decades, however, derivatives markets have grown explosively and decoupling has become increasingly commonplace.[72]

For example, in 1985, the year that the swaps and derivatives dealers formed their industry trade association, the size of the swaps market was estimated at $100 billion.[73] While clearly considerable, this paled in comparison to the $2.2 trillion U.S. market for publicly traded stocks.[74]

Since then, derivatives markets have become so enormous that it is difficult to conceptualize their size.[75] In June 2012, the size of global derivatives markets was estimated at almost $650 trillion.[76] That is more than ten times

(2001) (discussing connections between certain firms' securities that investors can utilize); Hu & Black, supra note 2, at 844–46 (same). Our point is simply that derivatives make decoupling far cheaper and easier, and therefore much more likely to occur. Even decoupling strategies that do not require derivatives—such as investing in a competitor whose value increases whenever the first company's value decreases—are much easier and cheaper to execute by using derivatives. See Hu & Black, supra note 2, at 823, 831–32.

[71] Cf. Partnoy, supra note 67, at 250–58 (discussing the difficulty of finding counterparties for sufficiently large derivatives transactions).

[72] Scholars debate the chief causes of this growth. Derivatives often enable parties to hedge risk more cheaply than they could otherwise, but they also can allow parties to speculate or avoid regulations or taxes. See Victor Fleischer, Regulatory Arbitrage, 89 Tex. L. Rev. 227, 229–30 (2010).

[73] Partnoy, supra note 67, at 44–45 (discussing the formation of the International Swap Dealers Association ("ISDA")). Numbers quoted herein are notional amounts, which is, roughly, the amount of money at stake in the contract. Typically, this is much larger than the amount of money that actually changes hands in the course of the contract. See id. at 148–49.

[74] Ctr. for Research in Sec. Prices, U.S. Stock Database, http://www.crsp.com/products/ stocks.htm (subscription required) (The amount is the TOTVAL output for NYSE/AMEX/ NASDAQ/ARCA in December 1985 in database) (on file with Virginia Law Review Association). This number comes from the TOTVAL variable in the Center for Research in Security Prices ("CRSP") database for December 31, 1985, which captures the total market value for all non-ADR securities on the NYSE, AMEX, NASDAQ, and ARCA with valid prices.

[75] See Partnoy, supra note 67, at 4–6, 402 (discussing the modest beginnings of derivatives trading and the tremendous size the derivatives market later reached). To be clear, much of the derivatives market is not directly related to corporate equities or debt. See Comm. of Eur. Sec. Regulators, Standardisation and Exchange Trading of OTC Derivatives 5 (2010), available at http://www.esma.europa.eu/system/files/10_610.pdf (estimating that, together, interest rate and foreign exchange contracts constitute approximately eighty percent of over-the-counter derivatives, as measured by notional amounts). Nonetheless, the point remains that markets for derivatives, including those related to firms, have become much larger.

[76] Monetary & Econ. Dep't, Bank for Int'l Settlements, Statistical Release: OTC Derivatives Statistics at End-June 2012, at 1 (2012), available at bis.org/publ/otc_hy1211.pdf (reporting the notional value of outstanding derivatives contracts as $639 trillion).

the combined value of all publicly traded stocks worldwide at its peak.[77] It is more than forty times the economic output of the United States[78]—and almost eight times the economic output of the entire world[79]—that year.

The tremendous growth of derivatives markets has enabled a surge in decoupling incidents. Professors Hu and Black, who have been at the forefront of decoupling scholarship, have catalogued significant decoupling incidents stretching back over two decades.[80] They found five times as many examples from 2000–2003 as from 1995–1999,[81] and nineteen times as many from 2004–2006.[82] As derivatives markets grow,[83] decoupling seems likely to be an increasingly frequent occurrence.

In addition, the structure of the derivatives market both fosters opacity and regularly creates both empty voting and hidden ownership. Most derivatives are entered into "over the counter."[84] In other words, an investor who wants to acquire a derivative goes to an investment bank or similar entity and privately negotiates a contract. The investment bank's goal is to earn a profit by charging the investor a fee to enter into the transaction. The bank generally does not want the risk that comes with the contract, so it typically hedges that risk. These hedging transactions frequently render the bank an empty voter and the investor a hidden and morphable owner.

For example, suppose an investor wants to enter into a derivative contract that mimics the economic effects of owning ten shares of Microsoft stock[85]: The bank pays the investor whenever Microsoft stock increases

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[77] Compare id., with World Fed'n of Exchs., 2010 WFE Market Highlights 2 (2011), http://www.world-exchanges.org/files/file/stats%20and%20charts/2010%20WFE%20Market%20Highlights.pdf (reporting maximum WFE total of $60.855 trillion in 2007).

[78] United States—Annual GDP 1990–2012, Statista.com (Feb. 2013), http://www.statista.com/statistics/188105/annual-gdp-of-the-united-states-since-1990/ (identifying U.S. GDP as $15.685 trillion in 2012).

[79] CIA, World Factbook (May 7, 2013), www.cia.gov/library/publications/the-world-factbook/geos/xx.html (estimating 2012 world GDP (purchasing power parity) as $83.12 trillion).

[80] Hu & Black, supra note 1, at 661 tbl.1 (collecting examples).

[81] See id. (finding ten examples from 2000–2003, but only two from 1995–1999).

[82] See id. (finding thirty-eight examples from 2004–2006).

[83] In the first half of 2011, for example, the derivatives market grew by an estimated eighteen percent. Monetary & Econ. Dep't, Bank for Int'l Settlements, supra note 76, at 1.

[84] Comm. of Eur. Sec. Regulators, supra note 75, at 28 ("OTC . . . derivatives trading currently accounts for approximately 85–90% of the market . . . .").

[85] Such contracts, commonly termed swaps or contracts for difference, sometimes receive more favorable tax or regulatory treatment than stock. For example, the dividends that U.S. corporations pay to non-U.S. shareholders are subject to a thirty percent withholding tax. 26 U.S.C. §§ 871(a)(1)(A), 1441(a)–(b) (2006 & Supp. 2012). For years, payments made under swaps contracts generally were not subject to this tax, even if those payments were economically identical to dividends. Fleischer, supra note 72, at 247–48; see also 26 U.S.C. § 871(m)

in value,[86] and the investor pays the bank whenever Microsoft stock decreases in value. So, if the price of a Microsoft share increases by $10, the bank pays the investor $100.[87] If the price of a Microsoft share decreases by $10, the investor pays the bank $100. The bank's profits will fluctuate depending on the value of Microsoft stock.

The bank can counteract this fluctuation by purchasing ten Microsoft shares: If the price of Microsoft shares increases by $10, the bank must still pay the investor $100, but the ten Microsoft shares that the bank owns are worth $100 more. Similarly, if Microsoft's share price falls by $10, the bank receives $100 from the investor, but the ten Microsoft shares in the bank's portfolio are worth $100 less. Any fluctuations in the value of Microsoft's stock affect the value of the bank's contract with the investor and the value of the bank's stock portfolio in ways that exactly offset each other.

By design, the bank now has no economic interest in Microsoft. Yet, as a Microsoft shareholder, it gets to vote in Microsoft corporate elections. Thus, the bank is an empty voter. The investor has an economic interest in Microsoft, but no control rights, making it a hidden owner. And, since the investment bank has no economic interest in Microsoft, but does have an interest in its relationship with its client the investor, the bank may well be willing to vote its shares according to the investor's wishes.[88] Thus, the investor's hidden ownership is likely to be morphable as well.[89]

Finally, because all it takes to create a derivative is for two parties to agree to create it, there is no natural limit on how large derivative markets can become. In our initial examples, Alice actually gives Bob Mi-

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(2006 & Supp. 2012) (limiting this tax arbitrage opportunity); Eric D. Chason, *Naked and Covered in Monte Carlo: A Reappraisal of Option Taxation*, 27 Va. Tax Rev. 135, 137 (2007) (arguing in favor of taxing options to "eliminate inefficient tax arbitrage and ensure equitable treatment of taxpayers").

[86] It also makes payments when Microsoft issues dividends.

[87] This is the product of $10 per share and ten shares.

[88] The bank may have offsetting interests in particular cases. For example, Microsoft may also be a client of the bank, and Microsoft management might want the bank to vote its shares in the opposite way than the investor does. See *BNS Post Says U.S. Hedge Fund Looks to Block Sears Deal*, Canada Stockwatch, Apr. 10, 2006, available at Factiva, Doc. No. CNSW000020060410e24a0012y (describing a similar situation in which Scotiabank voted with the interests of one client, Sears Holdings, instead of another client, the hedge fund Pershing Square).

[89] Alternatively, since the bank has already accomplished its goal of earning fees from arranging the transaction, it will likely be willing to unwind the transaction, cancelling the contract and selling its Microsoft shares to the investor at the market price. The investor would then be entitled to vote by virtue of her share ownership.

crosoft shares.[90] By contrast, in the investment bank example, the parties simply make cash payments to each other when the value of Microsoft shares changes; the parties never transfer any Microsoft shares.[91] Hence, such derivatives do not require either contracting party to own the underlying security. This means that derivatives markets can always grow and, as they do, decoupling becomes ever cheaper and more commonplace.

D. Problems of Decoupling

Increased decoupling raises several potential problems. Recall that, under the classical theory, the justification for giving shareholders control rights is that doing so maximizes the value of the corporation, which in turn maximizes social welfare.[92] That argument relies on shareholders' economic interests being aligned with the value of the corporation. Actors use their voting rights to further their interests;[93] if shareholders benefit when the company's value increases, they will use their voting rights to maximize the company's value, which will also maximize social welfare. But, if a shareholder's economic interests do not align with the value of the corporation, she will not use her control rights to maximize the company's value. The worse the alignment between shareholders' interests and corporations' values, the worse the classical theory predicts that outcomes will be. In particular, if shareholders have a net negative economic interest in the company, they should favor projects that aggressively squander corporate resources and destroy value.

The direct correspondence between shareholders' economic and control rights is important for another reason as well.[94] Disclosure rules are

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[90] These types of derivatives are termed physically settled, because the underlying security physically changes hands. See Adam W. Glass et al., Disclosure Requirements for Cash-Settled Equity Total Return Swaps—A Multi-Jurisdictional Survey, Wallstreetlawyer.com: Securities in the Electronic Age (West Legalworks, New York, N.Y.), Oct. 2008.

[91] Such derivatives are termed cash-settled. Id.

[92] See sources cited supra note 44.

[93] See Richard Posner, Economic Analysis of Law 3–4 (8th ed. 2011) (discussing the pervasive classical economic assumption that actors are self-interested).

[94] We assume, in this discussion, that mandatory disclosure of large ownership stakes is socially beneficial. Some scholars have argued to the contrary. See Frank H. Easterbrook & Daniel R. Fischel, The Proper Role of a Target's Management in Responding to a Tender Offer, 94 Harv. L. Rev. 1161, 1166 n.15, 1178–79 (1981); Alan Schwartz, Search Theory and the Tender Offer Auction, 2 J.L. Econ. & Org. 229, 230 (1986). We revisit this question in Section I.E, infra.

fundamental to modern securities laws worldwide.[95] The triggers for these disclosure obligations vary, however. Some are based on economic ownership.[96] Others focus on how much voting power an actor controls.[97]

Decoupling makes it easier for an investor to structure her holdings in a way that circumvents regulation.[98] This is true with respect to both the ownership thresholds that trigger public filings[99] and the interests that those filings must detail.[100] The more that investors can custom-tailor their holdings, the easier it is for them to exploit any gaps in the regulatory net. This increases the pressure on regulators to construct a regulatory net with fewer and smaller gaps.[101]

Finally, there is a potential fairness issue. Anecdotal evidence surrounding decoupling strategies frequently links these strategies with hedge funds and extremely wealthy individual investors.[102] Since most

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[95] See, e.g., Stephen M. Bainbridge, Mandatory Disclosure: A Behavioral Analysis, 68 U. Cin. L. Rev. 1023, 1023, 1025–26 (2000); Mathias M. Siems & Michael C. Schouten, The Evolution of Ownership Disclosure Rules Across Countries 10–19 (Univ. of Cambridge Ctr. for Bus. Research, Working Paper No. 393, 2009).

[96] See Hu & Black, supra note 2, at 839–40 (discussing examples from Italy and Australia).

[97] Id. at 836 (discussing examples from New Zealand).

[98] See generally Jordan M. Barry, Response, On Regulatory Arbitrage, 89 Tex. L. Rev. See Also 69 (2010) (discussing circumstances in which actors are most likely to avoid regulation through such structuring); Fleischer, supra note 72, at 229 (same). To take a dramatic example, a telecommunications minister allegedly used hidden ownership to conceal his twenty-five percent stake in a multibillion-dollar telecommunications company he was charged with regulating. See Heidi Brown & Chris Noon, Russian Billionaire's Alfa Group Sued in Federal Court, Forbes.com (June 9, 2006, 2:23 PM), http://www.forbes.com/2006/06/09/fridman-alfa-group-cx_cn_0609autofacescan06.html; Geoffrey T. Smith, Russian Minister Laundered Money to Buy Mobile Operator, Cellular-News, Dow Jones Newswires, May 23, 2006, available at http://www.cellular-news.com/story/17496.php.

[99] Disclosure regimes sometimes fail to require disclosure for functionally equivalent holdings. See Hu & Black, supra note 2, at 817 (discussing whether investor Perry's cash-settled derivatives positions triggered disclosure obligations under New Zealand law); GPG Bid for Rubicon Hits Snag, Dominion Post (Wellington), Sept. 9, 2002, at C1 (discussing same); see also Hu & Black, supra note 2, at 866 tbl.3 (illustrating variance among the interests triggering U.S. disclosure obligations).

[100] See Hu & Black, supra note 2, at 866 tbl.3 (illustrating this variance); id. at 867–75 (discussing same).

[101] See Fleischer, supra note 72, at 288 (discussing problems associated with increased regulation efforts); Frank Partnoy, Financial Derivatives and the Costs of Regulatory Arbitrage, 22 J. Corp. L. 211, 216 (1997) (discussing how unintended use of derivatives can burden regulatory systems). Even if regulators succeed in building a tighter net, that will generally mean that more investors will be burdened by regulation, which itself has costs. See Coase, supra note 52, at 18 (discussing the costs of regulation).

[102] See Hu & Black, supra note 1, at 661 tbl.1 (collecting examples).

investors are not extremely wealthy and cannot invest in hedge funds, they have less access to decoupling strategies. This is particularly troubling if decoupling strategies confer an advantage over other strategies.[103]

A number of dramatic examples from Switzerland illustrate each of these points.[104] In 2007, Swiss law required public disclosures by any shareholder with a 5% or larger interest in a Swiss public company.[105] That year, several investors shocked the market by announcing ownership interests in major Swiss public companies[106] that ranged from 20%[107] to a jaw-dropping 68%.[108] These investors avoided Swiss disclosure requirements by constructing their ownership interests out of derivatives that did not count toward the 5% threshold.[109] At the center of these transactions were a few very wealthy individuals, their investment vehicles, and a hedge fund.[110]

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[103] Presumably, actors who use decoupling strategies believe that such strategies confer an advantage; otherwise, they would not use them.

[104] See Hu & Black, supra note 1, at 655–59.

[105] Id. at 655; see also Bundesgesetz uber die Borsen und den Effektenhandel [BEHG] [Federal Act on Stock Exchanges and Securities Trading] Mar. 24, 1995, SR 954.1, art. 20, para. 1 (Switz).

[106] These companies included Sulzer AG, an engineering firm; Ascom, an electronics company; Unaxis, a technology company; Saurer, a machinery maker; Implenia, a construction group; and Converium, an insurance company. See Hu & Black, supra note 1, at 655–58. In January 2007, before these takeover attempts were announced, these companies' combined value was several billion dollars. See, e.g., Implenia, Annual Report 2006, at 24 (2007) ("[The company's] stock-market capitalisation as at 31 December 2006 was CHF 470.1 million."); Sulzer, Annual Report 2006, at 33 (2007) ("As of December 31, 2006, the corporation's market capitalization was CFH 5 045 947 610.").

[107] Chris Flood, Dexia 'Hidden Jewel' Highlighted, Fin. Times (London), Jan. 19, 2007, at 36, available at Factiva, Doc. No. FTFT000020070119e31j000dc (discussing Victory Industrial's stake in Ascom).

[108] Hu & Black, supra note 1, at 656–57 (discussing Victory Industrial's stake in Unaxis).

[109] Call options on corporate stock were counted towards the 5% threshold, but not cash-settled futures, swaps, or similar derivatives. See Federal Act on Stock Exchanges and Securities Trading [SESTA], art. 20, para. 2; Verordnung der Eidgenössischen Bankenkommission uber die Börsen und den Effektenhandel [BEHV-EKB] [Ordinance of the Swiss Federal Banking Commission on Stock Exchanges and Securities Trading] June 25, 1997, SR 954.193, art. 13, para. 1 (Switz.); Verordnung der Eidgenössischen Finanzmarktaufsicht über die Börsen und den Effektenhandel [Ordinance of the Swiss Financial Market Supervisory Authority on Stock Exchanges and Securities Trading] Oct. 25, 2008, SR 954.193, art. 15, para. 1 (Switz); Hu & Black, supra note 1, at 655; Simonian, supra note 14. Many of these transactions were later unwound so that the acquirer held the shares directly. See discussion supra Section I.C.

[110] Key players in these various takeover attempts included Viktor Vekselberg, a billionaire Russian oligarch, and his company Renova (Sulzer); multi-millionaires Georg Stumpf

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These events prompted significant responses from regulators and market participants. Two large banks, Zürcher Kantonalbank ("ZKB") and Deutsche Bank, were heavily involved in arranging some of the derivatives that acquirers used to build their ownership.[111] Swiss police raided both banks' offices.[112] ZKB's CEO and several other high-ranking executives resigned or were fired, and the bank changed its policy with respect to such transactions.[113]

Swiss regulators promptly expanded the securities used in calculating an investor's ownership to include a wider range of derivatives.[114] The Swiss Parliament reduced the disclosure threshold from 5% to 3% and expanded the class of derivatives that trigger disclosure even further.[115] These actions tightened the regulatory net, making it harder to evade the disclosure regime.[116] However, these measures do not address all gaps.[117]

It bears emphasis that Switzerland ranks among the world's largest financial centers. Approximately $1 trillion worth of shares are publicly traded on Swiss stock exchanges.[118] Furthermore, Swiss securities laws have much in common with those of other major financial centers, including the United States and the European Union.[119] If dramatic decou-

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and Ronny Pecik, their company Victory Holdings, and its subsidiaries (Ascom, Saurer, Sulzer, and Unaxis); billionaire Martin Ebner and his company Patinex (Converium); and hedge fund Laxey Partners (Unaxis and Implenia). See Carl Mortished, Swiss Investigate Vekselberg Firm over Stake-Building in Engineer, Times (London), Apr. 27, 2007, at 67; see also Jones & Simonian, supra note 14; Simonian, supra note 14; Waples, supra note 13.

[111] See Mortished, supra note 110.

[112] Carl Mortished, Deutsche's Zurich Offices Raided in Options Inquiry, Times (London), May 25, 2007, at 56; Reid, supra note 15.

[113] Simonian, supra note 15. ZKB did not leave the derivatives market; it merely decreed that it would not knowingly participate in hostile takeovers of its clients. Id.

[114] See Gericke & Dettwiler, supra note 16, at 1–2; Vogel & Sieber, supra note 16.

[115] See Gericke & Dettwiler, supra note 16, at 1–2; Vogel & Sieber, supra note 16.

[116] By requiring more investors to file disclosures, these changes impose additional recordkeeping costs on investors as a class, including those who will never attempt a takeover.

[117] Hu & Black, supra note 1, at 659.

[118] CIA, World Factbook (May 7, 2013), https://www.cia.gov/library/publications/the-world-factbook/geos/sz.html (listing the market value of all publicly traded shares on Swiss markets at $932.2 billion at the end of 2011). Switzerland easily surpassed many larger economies in this respect, including Russia ($796.4 billion), CIA, World Factbook (May 7, 2003), https://www.cia.gov/library/publications/the-world-factbook/geos/rs.html, and Italy ($431.5 billion), CIA, World Factbook (May 7, 2003), https://www.cia.gov/library/publications/the-world-factbook/geos/it.html.

[119] See Siems & Schouten, supra note 95, at 10–19 (discussing similarities between disclosure requirements in UK, Swiss, U.S., EU, and other countries' corporate and securities laws).

pling episodes can happen in Switzerland, then they can happen anywhere—and increasingly have.[120]

E. Potential Benefits of Decoupling

The Swiss experience illustrates some of decoupling's perils. Choosing an appropriate regulatory response to decoupling, however, is complicated by the fact that decoupling is not always bad. The classical theory generally assumes that maximizing the value of the corporation is efficient;[121] in other words, what is best for the corporation is best for society.[122] This assumption is often justified on the ground that public and private law gives corporations optimal incentives; that is, laws and contracts address negative externalities[123] and align the corporation's incentives with the social good.[124]

But, in practice, there are instances in which the course of action that is best for a corporation is not the best for society at large. In such circumstances, it is better for society if the corporation's shareholders do not select the option that maximizes the value of the corporation. Empty voting makes such outcomes more likely. In these cases, empty voting seems to be an outright social positive. Thus, decoupling may sometimes be a good thing.

For example, suppose that shareholders of widget manufacturer AcmeCo are considering a takeover offer from rival widget manufacturer BuyerCo. Assume that BuyerCo is motivated to pursue the transaction because acquiring AcmeCo will give BuyerCo a monopoly on widget

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[120] See Hu & Black, supra note 1, at 661 tbl.1 (collecting many examples).

[121] See sources cited supra note 44.

[122] See Hearings on Nominee Designates Before the S. Comm. on Armed Services, 83d Cong. 26 (1953) (statement of Charles E. Wilson, Nominee Designate to be Secretary of Defense) ("[W]hat was good for our country was good for General Motors, and vice versa."); Michael C. Jensen, Value Maximization, Stakeholder Theory, and the Corporate Objective Function, 14 J. Applied Corp. Fin., Fall 2001, at 8, 11 ("200 years' worth of work in economics and finance indicate that social welfare is maximized when all firms in an economy attempt to maximize their own total firm value.").

[123] A positive (negative) externality is a benefit (cost) of an activity that accrues to actors who are not involved in the activity. Jordan M. Barry, When Second Comes First: Correcting Patent's Poor Secondary Incentives Through an Optional Patent Purchase System, 2007 Wis. L. Rev. 585, 611 n.133.

[124] See Jensen, supra note 122, at 11–12, 16. An alternative is to assume that negative externalities are small in a particular context, or that they are balanced or outweighed by positive externalities. Another is to assume that affected parties address externalities by private contract. See Coase, supra note 52, at 15–16.

production. As a monopolist, BuyerCo will increase its profits by raising widget prices and reducing widget output, to the detriment of CustomerCo, the chief purchaser of widgets.[125] Such a transaction generally is not socially beneficial;[126] although BuyerCo (and AcmeCo) shareholders will reap benefits, CustomerCo and other buyers will suffer even larger losses.[127]

This is precisely the sort of transaction that antitrust regulators should prevent.[128] Yet suppose that they do not. What will happen? If AcmeCo shareholders make their decision based solely on whether the transaction is in the best interests of AcmeCo, the takeover will likely occur.[129] But, as discussed previously, this result is bad for society.

On the other hand, the more empty voting there is at AcmeCo, the more likely it becomes that people who do not have an ownership interest in AcmeCo—such as CustomerCo shareholders, who are hurt by the takeover—will influence AcmeCo's decision. This makes the takeover attempt more likely to fail.[130] That is bad for AcmeCo, but it is a better result for society. Thus, empty voting is socially beneficial in this instance. One can easily construct similar examples around failures in environmental, banking, insurance, labor, food and drug safety, tax, and

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[125] See Barry, supra note 123, at 597–99.

[126] See Posner, supra note 93, at 357–60. There could be an exception if the industry is characterized by efficient monopoly, see id. at 459–62, but for simplicity we assume that this is not the case here.

[127] Barry, supra note 123, at 597–99.

[128] See Posner, supra note 93, at 387–90.

[129] Because the transaction will boost BuyerCo's profits, it should be willing to offer AcmeCo shareholders a significant premium for their shares to induce their agreement. Alternatively, BuyerCo could structure a share-for-share deal that enables AcmeCo shareholders to receive some of the monopoly profits. Andrew J. Sherman & Milledge A. Hart, Mergers & Acquisitions: From A to Z 134 (3d ed. 2006) (discussing acquisition structures).

[130] The incentives of the empty voters themselves need not correspond to the incentives of society at large for this to be true. For example, they could be AcmeCo managers or employees concerned about losing their jobs after the takeover. See, e.g., Jordan M. Barry & John William Hatfield, Pills and Partisans: Understanding Takeover Defenses, 160 U. Pa. L. Rev. 633, 640 (2012). Multiple instances of empty voting have involved corporate managers resisting takeover attempts. See, e.g., Paul Waldie, Arcelor Parks Dofasco in Dutch Foundation; Move Seen as a Defence in Battle Against Rival Mittal's Takeover Attempt, Globe & Mail (Can.), Apr. 5, 2006, at B1, available at Factiva, Doc. No. GLOB000020060405e2450003v (describing how Arcelor management used empty voting to resist a takeover offer); The Hungarian Defence: An Oil Company Develops an Imaginative Takeover Defence, Economist, Aug. 11, 2007, at 55 (describing how MOL management used decoupling to resist a takeover offer).

many other types of regulations.[131] Examples can also be constructed around contracting failures, such as imperfect takeover offers, bond covenants, and corporate governance mechanisms.[132]

Similarly, there are also instances in which hidden ownership can promote efficient results.[133] Incentive pay and the threat of a takeover are two of the chief mechanisms that encourage corporate managers to perform well.[134] Thus, giving managers significant ownership rights in the corporation allows them to share in any increase in the company's value.[135] This encourages them to do a good job on behalf of shareholders.[136] Giving management substantial control rights, however, can entrench them and discourage takeover attempts,[137] which reduces their incentives to perform well.[138] Accordingly, shareholders may wish to give managers more ownership rights than control rights,[139] making managers hidden owners.

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[131] See, e.g., John Armour & Jeffrey N. Gordon, Systemic Harms and Shareholder Value 23–25, available at http://papers.ssrn.com (last visited Aug. 22, 2013) (arguing that behavior that maximizes the value of systemically important financial firms does not maximize social welfare because such firms' failures produce large externalities); Daniel Ferreira et al., Shareholder Empowerment and Bank Bailouts 3–6, available at http://papers.ssrn.com (last visited Aug. 22, 2013) (presenting evidence that banks whose managers were more accountable to shareholders had greater problems in the 2008 financial crisis because they were more likely to engage in risky nontraditional backing activities). Even perfect legal rules will be inadequate if agencies or counterparties cannot enforce them with sufficient vigor. See Posner, supra note 93, at 280–81.

[132] See, e.g., Alon Brav & Richmond D. Matthews, Empty Voting and the Efficiency of Corporate Governance, 99 J. Fin. Econ. 289, 289–90 (2011); Bruce H. Kobayashi & Larry E. Ribstein, Outsider Trading as an Incentive Device, 40 U.C. Davis L. Rev. 21, 25 (2006); Thomas A. Smith, The Efficient Norm for Corporate Law: A Neotraditional Interpretation of Fiduciary Duty, 98 Mich. L. Rev. 214, 220 (1999); Larry Ribstein, The Obscure Efficiency of Empty Voting, Truth on Market (Dec. 17, 2010, 7:53 AM), http://truthonthemarket.com/2010/12/17/the-obscure-efficiency-of-empty-voting.

[133] See Paul A. Gompers et al., Extreme Governance: An Analysis of Dual-Class Firms in the United States, 23 Rev. Fin. Stud. 1051, 1054–55 (2010) (finding that firm values increase with managers' economic interests and decrease with managers' voting interest).

[134] See Posner, supra note 93, at 558–62; Michael C. Jensen & Richard S. Ruback, The Market for Corporate Control: The Scientific Evidence, 11 J. Fin. Econ. 5, 6 (1983).

[135] These usually come in the form of restricted stock or stock options. See Bainbridge, supra note 28, at 792.

[136] See Alan J. Meese, Essay, The Team Production Theory of Corporate Law: A Critical Assessment, 43 Wm. & Mary L. Rev. 1629, 1631 (2002).

[137] See Randall Morck et al., Management Ownership and Market Valuation: An Empirical Analysis, 20 J. Fin. Econ. 293, 294–95 (1988) (finding this pattern).

[138] Jensen & Ruback, supra note 134, at 31.

[139] This is one reason why companies often give managers stock options instead of stock itself; option holders generally have no right to vote in corporate elections. See Posner, supra

Decoupling may also improve social welfare indirectly by facilitating more efficient allocations of control rights.[140] When shareholders exercise their control rights over a firm, they do so from a place of uncertainty. They do not know what will happen in the future, either within the firm or the economy as a whole. Shareholders do have some information about the current state of the world and how it is likely to progress in the future, and they make decisions based on their interpretations of that information. The quantity and quality of information that shareholders receive, their ability to interpret it, and their ability to influence management all vary. By separating control and ownership rights, decoupling allows shareholders to allocate decision rights to the shareholders best-equipped to wield them. This allows the shareholders to maximize expected social value.

To take a simple example, suppose there are two shareholders in a corporation, Alice and Paul, who want to maximize the corporation's value. Alice is an active shareholder who carefully follows the firm's activities. Paul is a passive shareholder who does not. The uninformed Paul might want to give his control rights to the informed Alice, on the logic that she shares his interests and will presumably make better decisions.[141]

A similar dynamic has played out several times in securities markets.[142] Consider the hedge fund Laxey Partners. After Laxey invests in a company, it frequently agitates for measures that it believes will benefit shareholders.[143] To increase its leverage over corporate management, Laxey sometimes increases its control well beyond its economic ownership; in other words, it becomes an empty voter. For example, in one instance, Laxey increased its voting interest to a whopping nine times its economic interest.[144]

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note 93, at 563–67 (discussing the relative advantages of different forms of incentive pay); Morck et al., supra note 137, at 294–95.

[140] See Ribstein, supra note 132.

[141] This mirrors the corporation's separation of ownership and control, in which shareholders give managers the right and obligation to run the corporation on a day-to-day basis. Bainbridge, supra note 28, at 192; see also Welch, supra note 65, at 290–91 (discussing the efficient capital market hypothesis, which predicts that investors generally cannot earn higher returns by observing corporations' actions).

[142] For other examples, see Hu & Black, supra note 1, at 661 tbl.1.

[143] We take no position on whether Laxey's views are correct, or whether these changes are socially beneficial.

[144] See Martin Flanagan, British Land Denies Call for DTI to Probe Laxey, Scotsman, July 22, 2002, at 19, available at Factiva, Doc. No. sc00000020020722dy7m000b6; William Kay,

Similarly, hidden ownership can encourage shareholders to monitor managers more carefully and to make better decisions. Suppose that many investors each own a small share of a firm. Acquiring and processing information about the company's affairs is costly; it takes time and effort. The investor will bear all the costs she exerts to monitor the firm's activities, but any benefits that her efforts produce will be shared among all shareholders. Thus, each investor will be tempted not to spend her own resources acquiring information about the company and to instead "free-ride" off other investors' efforts.[145] The larger a shareholder's economic interest, the more likely she will be to expend resources acquiring and processing information.[146] Hidden ownership can make it easier for existing shareholders to increase their economic interest, which encourages information gathering and combats the free-rider problem.[147]

Finally, it is worth noting that decoupling is not strictly necessary to achieve any of the potential efficiency gains that we have detailed. In theory, all of them can be achieved without decoupling. For example, in the antitrust example above, a party who wishes to block the transaction could purchase AcmeCo and reject BuyerCo's offer, or pay AcmeCo to reject the offer.[148] In the Alice and Paul example above, Alice could simply tell Paul what she thinks is best, and Paul could vote accordingly.[149]

Nonetheless, decoupling may offer significant efficiency benefits in practice. A number of real-world frictions can prevent actors from entering into arrangements like those discussed above. Regulatory re-

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Investigation Launched Over British Land Vote, Independent (London), July 22, 2002, at 15, available at Factiva, Doc. No. nd0000020020721dy7m000e3 (describing how Laxey Partners voted a nine percent stake despite owning only one percent of the company's shares).

[145] See Bainbridge, supra note 28, at 35–38.

[146] See id.

[147] For example, if shareholders engage in derivatives transactions that significantly increase their economic ownership in the corporation, multiple shareholders could each possess an economic interest equivalent to holding a majority of the company's outstanding shares. See supra Section I.C.

[148] See Coase, supra note 52, at 10–11 (discussing similar examples in the nuisance law context).

[149] Many investors look to Institutional Shareholder Services Inc. ("ISS") for exactly this service. See About ISS, Institutional Shareholder Services Inc., http://www. issgovernance.com/about (last visited Apr. 7, 2013).

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strictions,[150] credit constraints,[151] and takeover defenses such as poison pills[152] may limit the size of the portfolios that actors can hold. There may simply be high transaction costs.[153] Decoupling offers another mechanism for actors to pursue their goals. And, since securities trades are generally extremely low-transaction-cost transactions,[154] there is particular reason to think that decoupling may increase the parties' ability to reach more efficient outcomes.[155]

Thus, there are instances in which decoupling is socially beneficial. Accordingly, to enact a comprehensive response to decoupling behavior, one must have a framework for analyzing precisely when decoupling is problematic and when it is beneficial. So far, such a framework has proven elusive. As we discuss below, this is because competitive equilibrium, the most common tool for economic analysis, fails in the context of decoupling.

II. THE COMPETITIVE EQUILIBRIUM MODEL

To study markets, economists employ models that abstract and simplify real-world transactions. Although these models' details vary significantly, they generally share several basic structural features: Each model, like each market, is composed of various actors. Each actor has preferences with respect to different combinations of goods that she might buy or sell.[156] Since our analysis focuses on financial markets, the goods are securities and each actor is an investor seeking to maximize

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[150] Cf. Partnoy, supra note 67, at 38–39, 67–68 (discussing regulatory restrictions on the types of investments certain actors can make).

[151] See, e.g., Welch, supra note 65, at 243–44.

[152] The poison pill is the most important takeover defense. It discourages a would-be acquirer by threatening her acquirer with dilution (the poison) if she reaches a certain threshold of ownership (that is, swallows the pill). See generally Barry & Hatfield, supra note 130 (providing background). Sometimes a share ownership threshold as low as five percent will trigger a pill. Versata Enters., Inc. v. Selectica, Inc., 5 A.3d 586, 588–89 (Del. 2010) (upholding such a poison pill).

[153] See Coase, supra note 52, at 15–16 (highlighting the importance of transaction costs).

[154] See Welch, supra note 65, at 244 (giving an example for a specific NYSE-listed security).

[155] See Jennifer E. Bethel et al., The Market for Shareholder Voting Rights Around Mergers and Acquisitions: Evidence from Institutional Daily Trading and Voting, 15 J. Corp. Fin. 129, 130 (2009) (finding that the average vote sells for a price that is indistinguishable from zero); Susan E.K. Christoffersen et al., Vote Trading and Information Aggregation, 62 J. Fin. 2897, 2913 (2007) (same).

[156] Actors may also be able to produce or consume goods. Since we are focused on financial markets, we do not address this here.

her wealth. We now turn to our first model, based on competitive equilibrium.[157]

A. *The Standard Approach*

Competitive equilibrium analysis is by far the most common tool that economists use to analyze markets.[158] Given a set of actors with specified preferences, a competitive equilibrium consists of a market price for each good and an allocation of goods among the actors. To be a competitive equilibrium, it must be the case that (1) each actor can buy or sell as much of each good at its market price as she wishes, and (2) each actor is maximizing her well-being, given market prices. In other words, it cannot be possible for any actor to make herself better off by buying or selling goods at their market prices.

In essence, a competitive equilibrium is a set of prices at which the market clears.[159] There are no frustrated sellers or buyers; anyone who wants to buy or sell at the prevailing market price may do so.

A simple example helps illustrate these abstract points. Consider a market with two actors, Alice and Bob, and one asset, FirmCo stock. Assume that there are 100 shares of FirmCo stock, and that the value of each share is $10.[160] Consider the outcome in which the share price of FirmCo stock is $10, and Alice and Bob each own 50 shares. Alice and Bob are both acting in ways that maximize their well-being; neither can make herself better off by buying or selling FirmCo shares. Accordingly, this outcome is a competitive equilibrium.[161]

Competitive equilibria have a number of features that make them very useful. First, competitive equilibria have been proven to exist in a wide range of settings.[162] Second, at a competitive equilibrium, there is no

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[157] For simplicity, we generally use the term "model" to encompass both the description of the setting (including such elements as the actors involved and the way in which they interact) and the solution concept (either competitive equilibrium or core outcome, as indicated).

[158] See generally Andreu Mas-Colell et al., Microeconomic Theory (1995) (building the framework for competitive equilibrium, then applying the concept extensively).

[159] See Companion Paper, supra note 27, at 3.1.

[160] Corporate finance commonly assumes that a share's value is simply the present value of the dividend payments it produces. See Welch, supra note 65, at 39–40. We generally adopt this assumption going forward.

[161] In this simple example, any allocation of shares between Alice and Bob would qualify. The key issue is that the price of FirmCo stock be $10.

[162] See Mas-Colell et al., supra note 158, at 511–782 (1995) (exploring competitive equilibria under a wide variety of assumptions).

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way to make any actor better off without making someone else worse off.[163] In the context of financial markets, this corresponds to maximizing social welfare—that is, the total combined well-being of all actors.[164] This property is known as efficiency;[165] accordingly, competitive equilibria are referred to as efficient.[166] In addition, competitive equilibria can generally be reached through voluntary trading, without outside intervention.[167] Once a competitive equilibrium is reached, the market should be stable; all transactions that improve the parties' utilities have already been consummated, so no one wants to engage in additional purchases or sales.[168] Finally, competitive equilibrium analysis allows economists to make strong predictions as to what outcome a particular market will produce; in many instances, competitive equilibria are unique.[169]

Our simple competitive equilibrium example above illustrates many of these properties. The example presented constitutes a competitive equilibrium, so a competitive equilibrium exists. The outcome is stable, as neither party wants to engage in any additional purchases or sales. The equilibrium provided is not unique, but in all competitive equilibria, the market price of FirmCo stock is $10;[170] thus, competitive equilibrium provides a clear prediction about market prices.

B. Control Rights

Analyzing decoupling requires a model that includes both ownership rights and control rights. Traditional economic models generally do not include meaningful control rights. Once control rights are added, it makes sense to require that each actor exercise her control rights in accordance with her self-interest; this mirrors the requirement that each actor buy and sell in accordance with her self-interest. In other words, for an outcome to constitute a competitive equilibrium, there cannot be any

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[163] This concept is known as Pareto efficiency. Varian, supra note 58, at 302.
[164] See id. at 560 (defining social welfare function). The intuition is that financial market models generally allow money transfers. This enables transfers from winners to losers to compensate the losers for their losses. Therefore, any action whose benefits exceed its costs constitutes a Pareto as well as global efficiency improvement.
[165] Mas-Colell et al., supra note 158, at 313.
[166] Varian, supra note 58, at 521–23.
[167] Mas-Colell et al., supra note 158, at 660–64, 694–99.
[168] Id. at 652–60.
[169] Id. at 589–98, 606–16.
[170] See id. at 662–63.

actor who can make herself better off by either or both (1) buying or selling goods at their market prices, and (2) changing how she exercises her control rights.

Unfortunately, adding control rights to classical models renders competitive equilibrium analysis much less useful:[171] Competitive equilibria may cease to be efficient;[172] worse, they may not exist at all.

We illustrate this through an example.[173] Consider two corporations, FirmCo and GiantCo. Assume that each company has 100 shares of stock outstanding, and that the aggregate value of each company's stock reflects the entire economic value of that company.[174] Suppose that there are four investors, Alice, Bob, Carol, and Dan. Alice, Bob, and Carol each own one-third of FirmCo's shares and control one-third of its votes; for now, we assume that their voting interests are not transferable.[175] Dan owns all of GiantCo. FirmCo's shareholders are considering whether to accept a takeover offer from GiantCo, and their decision affects the value of both companies' shares.[176] For the takeover to go forward, a majority of FirmCo votes must be cast in favor of it.[177]

Through their votes, Alice, Bob, and Carol determine whether FirmCo will accept GiantCo's takeover offer. The acquisition will take place if any two of Alice, Bob, and Carol vote in favor of it; otherwise, it will not.[178] If FirmCo accepts the takeover offer, each share of FirmCo stock will be worth $8, and each share of GiantCo stock will be worth $21. On the other hand, if FirmCo rejects the takeover offer, each share of Firm-

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[171] Companion Paper, supra note 27, provides formal proofs of the statements in this section.

[172] See generally Eddie Dekel & Asher Wolinsky, Buying Shares and/or Votes for Corporate Control, 79 Rev. Econ. Stud. 196 (2012) (finding inefficient equilibria).

[173] See also Companion Paper, supra note 27, at 3.1 ex. 3.1.

[174] In other words, there are 100 shares and the company has no other equity or debt. See Welch, supra note 65, at 11, 45 (identifying the value of an enterprise as the value of all cash flows it produces). We generally adopt these assumptions in our examples unless otherwise noted.

[175] Cf. infra Section II.C (considering the case of transferable voting rights).

[176] We generally contemplate takeover offers, but our examples work equally well for any transaction requiring a shareholder vote. See, e.g., Andrew MacDougall et al., A Call to Arms on Empty Voting!, Osler, Hoskin & Harcourt LLP (Aug. 2, 2012), http://osler.com/NewsResources/A-Call-to-Arms-on-Empty-Voting/ (discussing a transaction in which TELUS combined two classes of its stock into one, which required shareholder approval).

[177] For simplicity, we assume that GiantCo's shareholders' approval is not necessary, but this assumption is not crucial to any of the points we demonstrate.

[178] Approval requires 50% of outstanding votes; since each shareholder controls one-third of outstanding votes, two shareholders must favor the takeover to meet the 50% threshold.

Co stock will be worth \$16, but each share of GiantCo stock will be worth \$6.[179] Table 1 summarizes these outcomes.

Table 1

	FirmCo Accepts	FirmCo Rejects
FirmCo Share Value	\$8	\$16
GiantCo Share Value	\$21	\$6
Combined Share Value	\$29	\$22

Consider an outcome in which: (1) Alice, Bob, and Carol each vote against the takeover; (2) FirmCo and GiantCo shares are priced at \$16 and \$6, respectively; and (3) no one buys or sells FirmCo or GiantCo shares. Alice, Bob, and Carol are all voting consistently with their self-interest; each of them has greater wealth if the takeover fails (\$533)[180] than if it succeeds (\$267).[181] The prices of FirmCo and GiantCo stock accurately reflect their values, given how Alice, Bob, and Carol exercise their control rights. No one can profit from buying or selling a share of either stock at its market price (possibly in conjunction with changing her votes), so no one wishes to do so. Thus, everyone is acting rationally in accordance with their self-interest and the market clears, making this outcome a competitive equilibrium.

However, this outcome is inefficient. When the takeover attempt fails, FirmCo and GiantCo have a combined value of \$2200,[182] which is less than their combined value of \$2900 when the takeover succeeds.[183] Introducing control rights created a competitive equilibrium that is inefficient.

One might wonder if this result was caused by dividing control rights among Alice, Bob, and Carol. One might think that vesting control rights in a single actor would solve the problem. Unfortunately, it does

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[179] Essentially, an acquisition would create gains, but the acquirer has made too low of a bid.

[180] Each has approximately 33.33 GiantCo shares, worth \$16 apiece.

[181] Each has approximately 33.33 GiantCo shares, worth \$8 apiece.

[182] See supra Table 1.

[183] Id.

not; it makes things worse. Unifying control rights can prevent competitive equilibria from existing at all.[184]

Consider a scenario in which there are only two people, Alice and Bob, in which GiantCo again attempts to acquire FirmCo. Initially, Alice and Bob each own 50 shares of stock in FirmCo and GiantCo. Assume that Alice has all of the FirmCo control rights, giving her complete control over FirmCo's decision, and that these control rights are not transferable. If FirmCo accepts GiantCo's takeover offer, each FirmCo share will be worth $8, and each GiantCo share will be worth $2. On the other hand, if FirmCo rejects the takeover offer, FirmCo and GiantCo shares will both be worth $4.[185] Table 2 summarizes these outcomes.

Table 2

	FirmCo Accepts	FirmCo Rejects
FirmCo Share Value	$8	$4
GiantCo Share Value	$2	$4
Combined Share Value	$10	$8

No competitive equilibrium exists: Given any set of prices and proposed allocation of shares, it is always possible for Alice to make herself better off by (1) trading in FirmCo and GiantCo shares, then (2) using her FirmCo control rights to shift FirmCo's response to GiantCo's takeover offer away from what was expected. We illustrate this by proof through contradiction.

The first key insight is that, at any competitive equilibrium, the market prices of FirmCo and GiantCo shares must reflect their expected values.[186] The benefit of owning shares is the shares' expected value. The cost of acquiring shares is their prevailing market price. If shares'

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[184] See Companion Paper, supra note 27, at 3.1 ex. 3.2.

[185] Evidence suggests that this basic fact pattern is common; empirical studies generally find that acquirers' returns from takeovers are either indistinguishable from zero or slightly negative, but that target shareholders receive sizable gains. See, e.g., Robert F. Bruner, Does M&A Pay? A Survey of Evidence for the Decision-Maker, 12 J. Applied Fin., Spring/Summer 2002, at 48, 51–56 (finding zero returns for acquirers, positive for targets); Jensen & Ruback, supra note 134, at 7–8 (same).

[186] See supra notes 159 and 161. For simplicity, we assume that actors are risk-neutral.

value exceeds their cost, buying shares increases the buyer's wealth.[187] Thus, if the price of a share is less than the expected value of that share, Alice can make herself better off by buying the underpriced shares.[188] Similarly, if a share is priced above its expected value, Alice can improve her well-being by selling that company's shares.[189] Recall that at a competitive equilibrium, no actor can make herself better off by buying or selling goods at their prevailing market prices. It therefore follows that, in any competitive equilibrium, the market prices of FirmCo and GiantCo shares must be their respective expected values.[190]

With this in mind, now suppose that some competitive equilibrium exists in which FirmCo rejects the takeover offer. The market prices of FirmCo and GiantCo shares must be $4, their value if FirmCo rejects the offer. Alice can therefore sell all of her shares of GiantCo, and purchase additional shares of FirmCo, for $4 a share.[191] Then, using her control rights over FirmCo, she can cause FirmCo to accept the takeover offer. This will make all of her FirmCo shares appreciate in value to $8, which will make her strictly better off than she is at the supposed competitive equilibrium—a result that should not be possible if the market was at a competitive equilibrium.

For example, imagine that the proposed competitive equilibrium has Alice owning 50 shares of FirmCo and 50 shares of GiantCo. Each of Alice's 100 shares is worth $4, for a combined total of $400.[192] If Alice sells all of her GiantCo shares and buys all of the outstanding FirmCo shares, she will have 0 GiantCo shares and 100 FirmCo shares. If she

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[187] This would be equivalent to paying $10 for a stream of future payments worth $20 today. Cf. Fleischer, supra note 72, at 247–48 (giving two examples of such arbitrage opportunities).

[188] Alice can do so because, at a competitive equilibrium, any actor can buy (or sell) as much of each good as she wants at its market price. See supra Section II.A. Bob, too, can employ this strategy.

[189] The logic is the same; the shares' price—the benefit of selling—exceeds their value—the cost of reducing ownership. Again, Bob could also do this.

[190] This follows from the risk-neutrality assumption. See supra note 186.

[191] This is always possible if Alice can increase her interest in FirmCo and decrease her interest in GiantCo without bounds—and as derivatives markets grow, this becomes ever closer to reality. But, even assuming that Alice can own, at most, 100 FirmCo shares and, at least, zero GiantCo shares, she still profits by increasing her FirmCo ownership, reducing her GiantCo ownership, and changing FirmCo's response to the takeover offer. The only time she cannot do this is if she owns 100 FirmCo shares and zero GiantCo shares. This is not a competitive equilibrium, however, because Alice can improve her welfare by changing her vote.

[192] See supra Table 2.

then has FirmCo accept the takeover offer, each of her 100 FirmCo shares will appreciate in value to $8, giving her a total wealth of $800.[193] Since $800 is more than $400, this represents an improvement in Alice's well-being—but if the starting point is a competitive equilibrium, as we assumed it to be, it should not be possible for Alice to improve her well-being.

Therefore, the starting point cannot be a competitive equilibrium. Since our only assumption about the starting point is that it is a competitive equilibrium in which FirmCo rejects the takeover offer, there can be no competitive equilibria in which FirmCo rejects the takeover offer.

Suppose instead that there is a competitive equilibrium in which FirmCo accepts the takeover offer. The market prices of FirmCo and GiantCo shares must be $8 and $2, respectively.[194] Alice can therefore sell all of her FirmCo shares for $8 each and buy GiantCo shares for $2 each.[195] Then, using her control rights over FirmCo, Alice can cause FirmCo to reject the takeover offer, causing all of her GiantCo shares to double in value to $4 and making her strictly better off than she is at the supposed competitive equilibrium.

For example, suppose the proposed competitive equilibrium has Alice owning 50 FirmCo shares and 50 GiantCo shares. The values of her FirmCo and GiantCo holdings are $400 and $100, respectively,[196] making a combined total of $500. If Alice sells all of her FirmCo shares and buys all 100 outstanding GiantCo shares, she will have 0 FirmCo shares, 100 GiantCo shares, and $300 cash. If she then has FirmCo reject the takeover offer, her 100 GiantCo shares will appreciate to an aggregate value of $400. Combined with her $300 cash, Alice will have $700 total wealth. Since $700 is more than $500, this represents an improvement in Alice's well-being—but, again, if the starting point is a competitive equilibrium, as we assumed, Alice should not be able to improve her well-being.

Consequently, this starting point cannot be a competitive equilibrium, either. It therefore follows that there are no competitive equilibria in

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[193] Id.

[194] Id.

[195] The boundary issues discussed in supra note 191 apply here. Again, they are not problematic; it is not a competitive equilibrium if Alice owns 100 GiantCo shares (the maximum) and zero FirmCo shares (the minimum), because Alice can double her welfare by changing her vote.

[196] See supra Table 2.

which FirmCo accepts GiantCo's takeover offer. But FirmCo can only respond to the outstanding takeover offer in one of two ways: It must either reject or accept the offer.[197] If neither of these choices is compatible with a competitive equilibrium, then no competitive equilibrium is possible. In this example, introducing control rights renders competitive equilibrium an impossibility.

Conceptually, the issue is that Alice can always use her control power to make herself better off by doing the following: First, she buys assets that will increase in value if FirmCo does not act as anticipated.[198] This is basically betting that the FirmCo shareholder vote will not play out as expected. Second, she uses her control rights to switch FirmCo's behavior away from what others expect, ensuring that she wins her earlier bet. This strategy, which we refer to as "Bet and Switch," prevents any particular outcome from ever constituting a competitive equilibrium.

C. Transferable Control Rights

Thus far, our models have not allowed actors to transfer control rights. But, in the real world, control rights generally depend on share ownership. Since shares are transferable, so are control rights. One might hope that modifying the models to allow actors to transfer control rights would solve these problems with competitive equilibrium analysis.

Unfortunately, the exact opposite is true; making control rights transferable renders competitive equilibrium analysis even more problematic.[199] If one assumes that control rights and economic rights are joined together as a single package, with a single price,[200] then competitive equilibria will not exist if there is at least one decision in which the deciding firm's interests are materially opposed to the interests of at least one other firm.[201] Since a firm's actions frequently have significant im-

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[197] Theoretically, FirmCo could accept probabilistically; Alice could flip a coin, and cause FirmCo to accept the takeover offer only if it comes up heads. However, no equilibria fit this mold, either. The proof mirrors the analysis above; Alice can profit by buying or selling FirmCo or GiantCo shares, then changing the probability that FirmCo accepts.

[198] She also sells assets that will decrease in value in the same circumstances.

[199] See also Companion Paper, supra note 27, at 4.1.

[200] This essentially corresponds to a world with small derivatives markets, in which firms have one class of stock.

[201] See id. at app'x C Theorem C.1. More specifically, competitive equilibria will not exist if some firm can make a decision that (1) is socially inefficient but (2) increases the value of some portfolio that includes a controlling bloc of shares in the deciding firm. For example, if

plications for its competitors,[202] suppliers,[203] customers,[204] and producers of complementary products,[205] competitive equilibria will often not exist.

To see why competitive equilibria become so rare, observe that making control rights transferable for a specified price has the effect of fixing a price for control. For example, suppose that a share of FirmCo stock has a price of $10 and carries a 1% voting interest in FirmCo. If 51% of FirmCo votes are required to exert control over FirmCo, any actor can acquire control of FirmCo by acquiring 51 FirmCo shares—which she can do at a cost of $510.

Thus, for a fixed price ($510), an actor can acquire the power to control FirmCo's decisions ("control power"). If FirmCo's decisions affect the value of other items, that actor can employ the Bet and Switch strategy discussed above[206]: That is, she can enter into transactions that become profitable if FirmCo acts in a way that others do not expect, then use her control power to cause FirmCo to behave in precisely that unexpected way. So long as she can enter into enough transactions to cover the fixed cost of acquiring control power over FirmCo, she is guaranteed to earn a profit.

Competitive equilibria are even less likely to exist when—as large derivatives markets allow—control rights and economic rights can be traded separately from each other.[207] In such circumstances, competitive equilibria will not exist if any firm's decision affects the value of anything—including the value of the firm itself. The logic is the same as when control and economic rights trade as a single package: An actor can acquire control power over a firm for a fixed price, then employ the Bet and Switch strategy. However, because one can now purchase con-

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a firm is faced with a decision under which one choice maximizes firm value, but the opposite choice maximizes social welfare, then no competitive equilibria will exist. Moreover, competitive equilibria are unlikely to exist if there is a large derivatives market for an asset whose value is affected by some corporation's decisions.

[202] See Ayres & Bankman, supra note 70, at 2, 7–10 (providing examples); Hu & Black, supra note 2, at 844 (discussing the example of Ford and GM).

[203] See Ayres & Bankman, supra note 70, at 3, 15–16 (discussing how investors can take advantage of such relationships); Hu & Black, supra note 2, at 844 (discussing the example of Ford and its suppliers).

[204] See Ayres & Bankman, supra note 70, at 1–3, 7–8.

[205] Cf. Barry, supra note 123, at 601–02 (discussing the effect of intellectual property laws on the development of complementary products).

[206] See supra Section II.B.

[207] See also Companion Paper, supra note 27, at 4.1 Theorem 4.1.

trol power without also acquiring significant economic rights, the strategy becomes cheaper and can be employed profitably in more circumstances.

This is precisely what happened in the Henderson Investment example discussed earlier.[208] The bid for Henderson Investment was expected to succeed, and Henderson Investment's stock price reflected this.[209] The hedge fund quietly acquired enough control power over Henderson Investment to be able to block the proposed takeover.[210] Next, the hedge fund entered into short sale transactions with respect to Henderson Investment's stock.[211] These transactions would yield a profit if, counter to expectations, Henderson Investment rejected the takeover offer.[212] Finally, the hedge fund used its control power to prevent the takeover, surprising market watchers and yielding the hedge fund a tidy profit.[213]

In short, competitive equilibrium analysis is a poor tool for analyzing decoupling. Competitive equilibria may be inefficient, and may not exist at all. The bigger that derivative markets are, the worse these problems get; when derivatives markets are very large, competitive equilibria essentially never exist.

III. THE CORE OUTCOME MODEL

Part II demonstrates that competitive equilibrium analysis is unsuitable for studying decoupling. We propose an alternative approach: core outcome analysis.[214] For an outcome to constitute a core outcome, it cannot be possible for any *group* of actors to change their behavior in a way that makes the group as a whole better off.[215] For this purpose, a

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[208] See supra Introduction.

[209] Cheng, supra note 4.

[210] McMillan, supra note 6.

[211] Id.

[212] Id.

[213] Id.

[214] We adapt this from a concept in cooperative game theory known as the core. See Myerson, supra note 23, at 427–36. The description adopted here is intended to facilitate an understanding of the concepts. Readers interested in a more formal discussion should refer to the Companion Paper, supra note 27, which addresses these issues with more mathematical rigor and slightly different terminology. Finally, we note that, when there are no control rights, every competitive equilibrium induces a core outcome.

[215] This is equivalent to showing that there is no way to make every group member better off. See Companion Paper, supra note 27, at 3.2. Essentially, if the group's winners gain more than its losers lose, they could (over)compensate the losers for their losses and remain winners.

group can be as small as a single actor, as large as all the actors in the model, or anywhere in between.[216] Actors in the core outcome model, unlike actors in the competitive equilibrium model, cannot automatically buy or sell goods at prevailing market prices. To buy or sell, an actor must have a willing counterparty—meaning that the counterparty must also benefit from the transaction.

It is helpful to illustrate the core outcome concept with a simple example. Suppose that, initially, all actors have the same portfolio of economic and control rights. Suppose that there are no trades and that every actor votes in her own best interest—which is also the group's best interest, because each actor has the same portfolio. This is a core outcome.

To see this, first observe that any intra-group sale or purchase leaves the group's collective assets unchanged;[217] the only way to make the group better off (or worse off) as a whole is to change one or more firms' decisions. Recall that every actor holds the same portfolio. Therefore, if changing a firm's decision improves the value of the group's portfolio, it must also improve the value of every actor's portfolio. But if there is a way to improve the value of everyone's portfolio by changing some actors' votes, that means there are some actors who are not voting according to their self-interests. This creates a contradiction, however, because we assumed that every actor was voting in her own best interest. Thus, no group can defect and make its members better off—the market is at a core outcome.

The core outcome has some very desirable properties that make it an attractive tool for analyzing decoupling, including existence, efficiency, voluntariness, stability, reasonableness, and predictive power. All of these properties hold regardless of whether control rights are transferable or separable from ownership rights.[218]

A. Existence and Efficiency

Core outcomes always exist.[219] The touchstone of both competitive equilibria and core outcomes is that, in each instance, actors are maxim-

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[216] See id. A lone defector, however, can only change her vote.

[217] See id. at 3.2. Moving value from one group member to the other is somewhat like moving money from an actor's left pocket to her right pocket.

[218] See id. at 3.2, 4.2; infra Sections III.A–D.

[219] Companion Paper, supra note 27, at 3.2 Theorem 3.2, 4.2. Theorem 4.3. This is true in our model, which is a generalization of the standard model of financial markets. However, the existence of core outcomes is not guaranteed in general. See, e.g., Varouj A. Aivazian &

izing their well-being. Yet, in markets with control rights, core outcomes always exist but competitive equilibria often do not. It is helpful to explore the intuition behind this difference.

For a given outcome to be a competitive equilibrium, every actor must maximize her well-being. Therefore, it must not be possible for any individual actor to improve her well-being by changing her behavior. In addition, each actor can always buy or sell goods at their market prices; in other words, a counterparty is always available. This generally enables an actor with control power to employ the Bet and Switch strategy: As long as there is a "Bet" available—that is, an asset she can buy that will increase in value if a firm makes an unexpected decision—there are always (assumed) counterparties to take the other side of the Bet. The actor can then use her control power to win the Bet. As long as she can make large enough Bets to offset any costs she incurred in acquiring control power, this strategy makes her better off.[220] The ready availability of the Bet and Switch strategy frequently prevents competitive equilibria from existing.[221]

By contrast, the core outcome model does not assume that a willing counterparty is always available; this makes the Bet and Switch strategy more difficult to execute.[222] Intuitively, the Bet and Switch strategy allows a party with control power to profit by confounding other parties' expectations. These profits, however, are often less than the losses she inflicts on her counterparties.[223] Put another way, if her counterparties had known what she was doing, they would not have agreed to transact with her. The Bet and Switch strategy requires the party with control to conceal what she is doing from the other parties—essentially, to trick them. But, in the core outcome model, transactions only occur if they produce benefits for the participating parties as a group.[224] This blocks

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Jeffrey L. Callen, *The Coase Theorem and the Empty Core*, 24 J.L. & Econ. 175, 175–76 (1981).

[220] When control rights are tradable, any actor can acquire control power for a fixed price. The cost drops significantly if control rights trade separately from economic rights. *See supra* Section II.C.

[221] *See supra* Section II.B. If control rights trade separately from economic rights, competitive equilibria almost never exist. *See supra* Section II.C.

[222] *See* Companion Paper, *supra* note 27, at 3.2, 4.2.

[223] Compare *supra* text accompanying notes 186–93 (providing an example where Alice's gains using Bet and Switch exceed Bob's losses), with *supra* text accompanying notes 194–97 (Bob's losses would exceed Alice's gains).

[224] Compare Companion Paper, *supra* note 27, at 3.2, 4.2 (core outcome model), with *id.* at 3.1, 4.1 (competitive equilibrium).

the Bet and Switch strategy in many instances in which the Switch moves the market to a less efficient outcome.

To see this, we reconsider our example from Section II.B in which we showed that no competitive equilibrium exists[225]: Alice and Bob each own 50 FirmCo shares and 50 GiantCo shares. FirmCo is considering whether to accept a takeover offer, a decision that affects the value of GiantCo as well as FirmCo.[226] Alice has all of the FirmCo control rights, giving her complete control over FirmCo's decision, and control rights are not transferable. If FirmCo accepts the takeover offer, each share of FirmCo stock will be worth $8, and each share of GiantCo stock will be worth $2. On the other hand, if FirmCo rejects the takeover offer, Firm-Co and GiantCo shares will each be worth $4. Table 3, below, summarizes these results.

Table 3

	FirmCo Accepts	FirmCo Rejects
FirmCo Share Value	$8	$4
GiantCo Share Value	$2	$4
Combined Share Value	$10	$8

Although no competitive equilibria exist in this situation,[227] core outcomes do exist. For example, if there are no trades,[228] and Alice has FirmCo accept the takeover offer, the result is a core outcome.[229] Recall that to constitute a core outcome, there must not be any way for any group of actors to change their behavior and make themselves better off as a whole. There are three possible deviating coalitions: Either Alice or Bob could act alone, or both could act together.

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[225] See supra notes 184–98 and accompanying text.

[226] GiantCo might make competitive or complementary products, for example. See supra notes 202 and 205.

[227] See supra Section II.B.

[228] This example assumes no trades for simplicity; many other initial endowments can lead to this same core outcome. To take one example, suppose Alice begins with all of the economic interest in GiantCo and Bob begins with all of the economic interest in FirmCo. See infra Section III.D.

[229] This example mirrors the example core outcome provided at the beginning of this Part. See supra notes 216–18 and accompanying text.

If either individual acts alone, her final portfolio must match her initial portfolio; purchasing or selling FirmCo or GiantCo stock requires a counterparty with which to transact. All that a single defector can do is change her vote. However, Alice's and Bob's initial portfolios each contain an equal amount of FirmCo and GiantCo stock. Since accepting the takeover bid maximizes FirmCo and GiantCo's combined value, it also maximizes the value of Alice's and Bob's respective portfolios. Therefore, neither party can make herself better off by keeping her initial portfolio and changing her vote.[230]

The only other possible coalition involves Alice and Bob deviating together. Between them, Alice and Bob own all of the economic interests in FirmCo and GiantCo. Thus, their aggregate well-being is just the two companies' combined value. Since the current outcome maximizes that sum, no deviation can raise it further. Thus, there is no coalition of actors that can improve their well-being relative to this outcome. Accordingly, this outcome is a core outcome.

Having proven that core outcomes always exist, it is straightforward to show that they are also efficient.[231] If an outcome is inefficient, that means a more efficient outcome is possible. All of the actors in the market could then form a deviating coalition and, by changing their behavior, shift the market to that more efficient outcome. This would, by definition, raise the well-being of the group as a whole.[232] However, if the initial outcome was a core outcome, it should not be possible for any group of actors to increase its overall well-being by changing its behavior. Thus, if the initial outcome was not efficient, it cannot have been a core outcome; no inefficient core outcomes may exist.

B. Voluntariness and Stability

Core outcomes have two key features that significantly increase the likelihood that the market will achieve a core outcome. First, for any initial allocation of ownership and control rights, there is at least one core outcome that makes each actor at least as well off as her initial allocation did.[233] This means that it is always possible for the market to

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[230] Bob does not even have any votes in this example.

[231] Companion Paper, supra note 27, at 3.2.1 Theorem 3.1, 4.2 Theorem 4.2.

[232] An improvement in the group's aggregate welfare can be translated into an improvement in each member's welfare through transfers. See id. at 3.2.

[233] Id. at 3.2.2, 4.2.

achieve a core outcome through voluntary trades: No matter what the condition of the market is at any moment, there is always a core outcome that all of the parties would happily accept. We term this feature voluntariness.

To understand the intuition behind this result,[234] think of financial markets as dividing up value among the actors. Each actor wants to maximize the value that she receives. Social welfare equals the total amount of value that is distributed. To use a common analogy, social welfare is a pie, and the actors get slices of varying sizes. Actors prefer larger slices of pie. Suppose the market starts out at an inefficient result. Recall that core outcomes are efficient; therefore, moving to a core outcome increases total social welfare—that is, it grows the pie. If the pie gets bigger, then everyone can have a slightly bigger slice.[235] Every actor should therefore be happy to move from the initial result to this core outcome result, because doing so makes her better off.[236]

A second property, which we call stability, complements voluntariness. Recall that, at a core outcome, no group of actors can coordinate their behavior and make themselves better off. That means there is no one with both the incentive and ability to change the status quo. This makes core outcomes stable; once a market reaches a core outcome, it should be expected to stay there.

On the other hand, if the market is not at a core outcome, then there *is* a group of actors that could make themselves better off by joining together to change the status quo. Thus, a non-core outcome is subject to instability and potentially rapid change—including to another non-core outcome that itself may rapidly change.

Together, voluntariness and stability paint an encouraging picture: No matter what happens, there will always be a core outcome to which all actors would agree. Non-core outcomes are unstable and likely to be temporary, but once a core outcome is achieved, it should endure. These insights give a mechanism by which markets will gravitate toward core outcomes.

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[234] We formally prove this in the Companion Paper. See id.

[235] If the market begins at an efficient result that is not a core outcome, there is still at least one core outcome that all parties would voluntarily move to. However, every actor's well-being is the same at the initial efficient outcome and at the core outcome. See id.

[236] See infra Section III.D for an example illustrating this concept.

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C. Reasonableness

Core outcomes have another feature that, while less formally defined than those discussed so far, is just as important for real-world applications: Core outcomes are not bizarre and pathological. Rather, they resemble many real-world outcomes.[237]

Traditional theories of portfolio selection predict that investors should diversify their holdings and limit their risk by acquiring the market portfolio—that is, each actor's portfolio should contain a mix of securities that resembles the composition of the entire market as a whole.[238] In the real world, this prediction does not play out precisely, presumably due to various frictions in financial and other markets.[239] Nonetheless, the observed behavior of financial market participants substantially conforms to this model in many cases.[240]

Such real-world scenarios, in which most investors hold relatively diversified portfolios, generally constitute core outcomes.[241] The fact that core outcomes are consistent with accepted portfolio theory and long-running real-world behavior strongly supports the core outcome framework.

D. Predictive Power

All of the core outcomes associated with a particular market share a number of features. This makes the core outcome framework a powerful analytical tool for predicting markets' behavior.

One key feature is that all core outcomes associated with a particular market produce the same total social welfare.[242] This follows from our

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[237] Nor are they so-called "knife-edge" portfolios, vulnerable to small changes in actors' portfolios or voting behavior. Cf. Marco Pagano, Trading Volume and Asset Liquidity, 104 Q.J. Econ. 255, 262–63 (1989) (discussing knife-edge conditions).

[238] Welch, supra note 65, at 181–90. This is an approximation, but it is close enough for our purposes.

[239] For example, there are transaction costs, taxes, and agency costs with respect to public company management that can be reduced through incentive compensation arrangements. See Coase, supra note 52, at 15; cf. Posner, supra note 93, at 563–67.

[240] See Goetzmann & Kumar, supra note 24, at 434–35; Northern Trust, Wealth in America Survey 2012: Key Findings, available at http://northerntrust.com/documents/white-papers/wealth-management/wealth-in-america-key-findings-2013.pdf ("Investors are diversified across asset classes with stocks, mutual funds and ETFs accounting for just over 50%.").

[241] See Companion Paper, supra note 27, at 3.2, 4.2 (showing that scenarios in which all investors hold diversified portfolios constitute core outcomes).

[242] See also id.

previous result that all core outcomes are efficient[243]: A core outcome would not be efficient if it provided less social welfare than another core outcome. Thus, all core outcomes must create the same amount of total social welfare.

This insight produces another one: Since different decisions by firms generally produce varying amounts of total social welfare, and all core outcomes create the same amount of social welfare, firms' decisions must generally be the same across all core outcomes. In other words, firms should make the same decisions in every core outcome.[244] Thus, the core outcome model offers strong exact predictions of firms' decisions.

Core outcomes are not unique, so one cannot predict the precise portfolio that each actor will hold. The core outcome model gives a range of predictions as to what the actors' final portfolios will be, however.

To illustrate this, we revisit a previous example.[245] Suppose Alice owns all the FirmCo shares; Bob owns all the GiantCo shares. Alice has all of the control rights over FirmCo, Bob has all of the control rights over GiantCo, and control rights are not transferable. GiantCo is considering acquiring FirmCo, a transaction that must be approved by both firms' shareholders.[246] If shareholders approve the takeover, each Firm-Co share will be worth $8, and each GiantCo share will be worth $2. On the other hand, if shareholders reject the takeover, each FirmCo and GiantCo share will be worth $4. Table 4 summarizes these results.

Table 4

	Takeover Succeeds	Takeover Fails
FirmCo Share Value	$8	$4
GiantCo Share Value	$2	$4
Combined Share Value	$10	$8

If Alice and Bob engage in voluntary transactions—either share-for-share trades or sales of shares for cash—until they reach a core outcome, what possible portfolios might each ultimately hold?

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[243] See supra Section III.A.

[244] It is possible to construct examples in which different combinations of decisions provide the exact same (efficient) level of social welfare. In the real world, however, such scenarios are unlikely to arise.

[245] See supra Sections II.B, III.A.

[246] This differs from our other examples, in which only FirmCo's approval is required.

First, recall that all core outcomes are efficient.[247] This corresponds to the takeover occurring, which maximizes the combined value of both companies.[248] If both parties keep their initial portfolios, the takeover offer will fail. This is because, initially, Bob only owns GiantCo stock, and rejecting the takeover offer maximizes GiantCo's value.[249] In such a scenario, Alice and Bob's respective portfolios would each be worth $400. Thus, if both Alice and Bob only engage in trades that further their self-interest, each party's final portfolio must be worth at least $400.

Next, recall that, to be a core outcome, there must not be a way for any group of actors to change their behavior and make themselves better off. As noted previously, the only possible deviating coalitions entail Alice or Bob acting alone or both of them acting together. The takeover is efficient, and Alice and Bob are the only actors in the model. Therefore, in any outcome in which the takeover happens, Alice and Bob cannot change their behavior and make themselves both better off.[250] If Alice or Bob deviates alone, all either can do is change how she votes. Thus, each party's final portfolio must make the takeover in her interest.

There are a number of possible outcomes that satisfy these criteria and therefore constitute core outcomes. Because Alice and Bob must own all the outstanding shares of FirmCo and GiantCo between them, knowing Alice's holdings enables us to infer Bob's holdings.[251] Therefore, we can represent both parties' portfolios by showing only Alice's portfolio.[252] Figure 1, below, shows the possible share distributions between Alice and Bob graphically.[253] Point A, in the lower right hand corner, represents Alice's initial portfolio. The shaded regions represent all of the final portfolios that are consistent with a core outcome and that

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[247] See supra Section III.A.

[248] Alice and Bob's combined well-being is FirmCo and GiantCo's aggregate value. That amount is $1000 if the takeover succeeds, but only $800 if it fails. See supra Table 4.

[249] Id.

[250] Their combined well-being is the sum of the companies' values, which is maximized when the takeover happens.
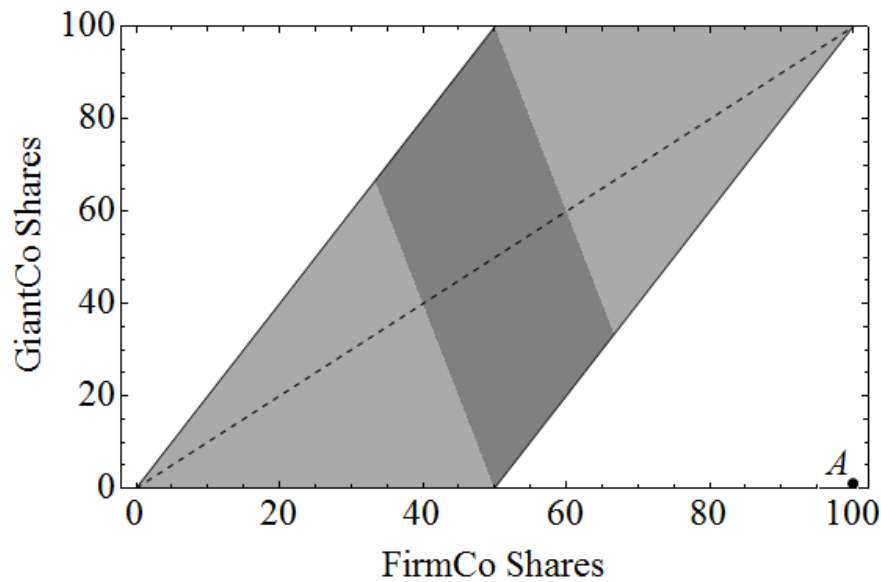
[251] Bob's portfolio must be whatever shares Alice does not own; for any company, the number of shares that Bob holds must be 100 minus the number of shares that Alice holds.

[252] If our example also included Carol, producing a comparable graph would be much more difficult.

[253] Figure 1 does not show Alice's or Bob's cash holdings.

satisfy the voluntariness condition.[254] The darker shaded region shows the portfolios achievable through share-for-share trades alone, and the lighter shaded region includes those realizable with cash transfers. The dotted diagonal line represents the outcomes in which Alice and Bob hold the market portfolio.[255]

Figure 1: Alice's Final Portfolio

Thus, while the core outcome model does not allow us to predict the exact portfolios that actors will hold, it does give us a range of possibilities. Combined with the unique predictions that it provides about securities' values and firms' decisions, the core outcome model provides a clear picture of the outcome a market should reach.

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[254] This means Alice and Bob would be willing to trade to that outcome voluntarily; in other words, both are at least as well off at that outcome as they were initially, before any trading.

[255] The two white triangular regions are portfolios in which approving the takeover is not in one of Alice's or Bob's interest. The light gray regions contain portfolios for which it is in both Alice's and Bob's interest to approve the takeover, but one party's portfolio is worth less than her initial portfolio. Thus, Alice or Bob will not voluntarily trade for portfolios in these regions without an accompanying cash payment.

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IV. IMPLICATIONS

We now turn to the implications of our analysis. We begin by considering the central role that information plays in decoupling, then focus on precisely what information is important. We use the insights this produces to examine how the consequences of disclosure requirements have changed over time. Finally, we evaluate the effects of two approaches that have been proposed in response to decoupling. The first approach is to target derivatives markets; the second approach targets corporate voting rules.

A. *The Importance of Information*

The competitive equilibrium model is a poor tool for analyzing decoupling. It often cannot make meaningful predictions about firms' decisions, securities' values, or actors' portfolios. Competitive equilibrium outcomes may or may not be efficient. In short, competitive equilibrium analysis makes few, if any, useful predictions regarding market outcomes, and cannot rule out inefficient outcomes.

The core outcome model, by contrast, makes precise predictions about firms' decisions and securities' values. It also makes strong predictions as to the range of portfolios that actors may hold. In addition, decoupling only occurs in core outcomes if it leads to socially efficient results. Core outcome analysis allows sharp predictions regarding market outcomes, and those predictions are encouraging.

Although they produce radically different predictions, the core outcome model and the competitive equilibrium model make many of the same assumptions. Actors have the same incentives in both models, and both models conceive of ownership and control rights in the same way. The key difference between the two models is this: Competitive equilibrium assumes that, if an actor wants to buy or sell at the market price, there are always counterparties available. The core outcome model does not assume the availability of counterparties; an actor will only agree to participate in a transaction if it benefits her. This difference can best be understood as a difference in assumptions about what information actors have.

The competitive equilibrium model envisions actors transacting in a vacuum, with no knowledge of other parties' holdings or their incentives. All they know is the market price, so that is all they consider when making decisions. The core outcome, by contrast, treats actors as having

a more complete view of the market. Accordingly, they have a clearer perspective on whether a particular transaction will redound to their benefit or not. This enables them to avoid transactions that are not in their interest much more effectively than they can in the competitive equilibrium model.

Thus, our analysis predicts that, when control rights are involved, it is vital for actors to be aware of each other's holdings. More specifically, when actors are well-informed, market transactions will produce efficient, predictable, and stable results. If actors do not have this information, however, then there is little cause to believe that markets will have any of these properties.[256] We now explore in more detail the type and nature of knowledge that the core outcome model requires.

B. What Information Is Necessary

For actors to move a market to a core outcome, or even to know that a core outcome has been reached, they must have substantial information about each other's economic interests and control rights.[257] In short, actors must be able to anticipate how control rights will be exercised. To do that, they must know who holds control rights and what those actors' economic interests are.

For example, suppose that FirmCo is again considering a takeover offer from GiantCo. The value of FirmCo and GiantCo shares both depend on FirmCo's decision; the takeover is good for FirmCo, but bad for GiantCo. Assume that Bob owns 60 FirmCo shares, which gives him the power to decide whether FirmCo will accept the takeover offer.

Suppose that Alice owns shares in FirmCo and is trying to determine what they are worth. To know that, she must anticipate FirmCo's response to the takeover offer, which means predicting what Bob will

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[256] Other types of information asymmetries have been shown to disrupt markets in other contexts. See George A. Akerlof, The Market for "Lemons": Quality Uncertainty and the Market Mechanism, 84 Q.J. Econ. 488, 489–91 (1970) (showing unraveling when parties have asymmetric information about values); Paul Milgrom & Nancy Stokey, Information, Trade and Common Knowledge, 26 J. Econ. Theory 17, 17–18, 27 (1982) (presenting the "no-trade theorem," which says that under certain conditions, financial markets will produce no trades because any offer implicitly informs counterparties that they would be foolish to accept).

[257] More precisely, that information must be common knowledge. See Drew Fudenberg & Jean Tirole, Game Theory 541–46 (1991) ("'[C]ommon knowledge' . . . describe[s] the infinite regress of 'I know that you know' . . . .").

do.[258] Presumably, Bob will vote based on his economic interests; the question, then, is whether Bob is better off if the takeover attempt fails or if it succeeds. Because the takeover offer is good for FirmCo but bad for GiantCo, Bob's interests depend on the ratio of FirmCo shares to GiantCo shares in his portfolio. Thus, Alice must know the contents of Bob's portfolio in order to predict FirmCo's decision. If FirmCo's control rights were spread among more individuals, Alice would need to know their economic interests as well. To be clear, Alice does not need to know how every outstanding FirmCo share will be voted; she must simply know enough to predict FirmCo's decision.[259]

Moreover, knowing the initial contents of Bob's portfolio is not sufficient to enable Alice to anticipate FirmCo's choice. There may be other actors who have a large economic interest in FirmCo's decision, and they may be able to induce Bob to change his votes. For example, suppose that Carol owns many GiantCo shares but no FirmCo shares. Because the takeover is bad for GiantCo, Carol strongly prefers that FirmCo reject the takeover offer. Carol may wish to sell Bob some of her Gi-GiantCo shares[260]: Such a sale would increase Bob's economic interest in GiantCo. This makes it more likely that Bob will not benefit from the takeover, in which case he will vote his FirmCo shares against it.

To complicate matters further, this need not be the final result, either. Alice, as a FirmCo shareholder, has an interest in the takeover offer being accepted. Thus, she may wish to try and influence Bob to vote in favor of it.[261] Actors can only predict firms' decisions with confidence once the market has reached a core outcome, and there may be several maneuvers and counter-maneuvers along the way.

This observation offers insight into a well-known tension in corporate scholarship regarding the value of the right to vote in corporate elections. One line of empirical scholarship has compared securities that provide similar cash flows but that have different levels of voting

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[258] Note that this does not require certainty; Alice can value her shares if she knows the probability that FirmCo will accept the takeover offer.

[259] If other firms are also making decisions, Alice must have enough information about the economic interests of the holders of those firms' control rights to predict those firms' decisions as well.

[260] Carol can use other transactions to accomplish this result; for instance, she could buy some of Bob's FirmCo shares.

[261] There are many ways she could accomplish this; for example, she could sell Bob some of her FirmCo shares.

rights.[262] These studies have generally found that securities that confer more voting rights command higher prices than those that do not.[263] This suggests that the right to vote is quite valuable to investors.

Another line of scholarship has examined the value of voting securities immediately before and after the relevant record date for votes.[264] Whoever owns a security on its record date has the right to cast the accompanying votes in the next corporate election.[265] Accordingly, an investor who buys the security immediately before the record date gets the right to vote in the next election, but one who buys the security immediately after the record date does not.[266] Thus, if investors value the right to vote, they should be willing to pay a higher price for the security immediately before the record date than they will immediately after the record date. These studies, however, have generally found no difference in the prices of securities before and after their record dates, suggesting that investors do not value the right to vote in corporate elections.[267]

These seemingly contradictory findings make perfect sense when viewed through the lens of core outcome analysis. In the long run, there will be many votes. Coalitions will be built, and an investor with voting rights may be recruited for a number of them. This prospect of future benefits makes voting rights a valuable commodity in the long run and,

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[262] See, e.g., Kee H. Chung & Jeong-Kuk Kim, Corporate Ownership and the Value of a Vote in an Emerging Market, 5 J. Corp. Fin. 35, 37 (1999); Shmuel Hauser & Beni Lauterbach, The Value of Voting Rights to Majority Shareholders: Evidence from Dual-Class Stock Unifications, 17 Rev. Fin. Stud. 1167, 1167 (2004); Melchior R. Horner, The Value of the Corporate Voting Right: Evidence from Switzerland, 12 J. Banking & Fin. 69, 69–70 (1988); Brian F. Smith & Ben Amoako-Adu, Relative Prices of Dual Class Shares, 30 J. Fin. & Quantitative Analysis 223, 223–24 (1995); Luigi Zingales, The Value of the Voting Right: A Study of the Milan Stock Exchange Experience, 7 Rev. Fin. Stud. 125, 125–26 (1994) [hereinafter Zingales, The Value of the Voting Right]; Luigi Zingales, What Determines the Value of Corporate Votes?, 1995 Q.J. Econ. 1047, 1047–49 [hereinafter Zingales, What Determines the Value?]; Peter Feldhütter et al., The Impact of Creditor Control on Corporate Bond Pricing and Liquidity 1 (Nov. 16, 2012) (unpublished manuscript), available at http://www.mfsociety.org/modules/modDashboard/uploadFiles/conferences/MC20~239~p17 egdjsisdgjjue4ik36k14m84.pdf; Avner Kalay et al., The Market Value of Corporate Votes: Theory and Evidence from Option Prices 1 (Apr. 20, 2012) (unpublished manuscript), available at http://ssrn.com/ abstract=1747952.

[263] See, e.g., Chung & Kim, supra note 262, at 51; Horner, supra note 262, at 69–70 (collecting sources); Smith & Amoako-Adu, supra note 262, at 223–24 (same).

[264] See Bethel et al., supra note 155, at 130; Christoffersen et al., supra note 155, at 2898–99.

[265] See, e.g., Del. Code Ann. tit. 8, § 213(a) (2011).

[266] Hu & Black, supra note 2, at 832–33.

[267] See supra note 155.

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if markets are efficient, these future benefits should be incorporated into securities prices. This explains the first line of scholarship. Immediately before an election, however, the market is likely to have reached a core outcome. If so, coalitions for the upcoming vote have presumably already been built, and investors do not expect additional coalition building in the vicinity of the record date. The next election's result is determined, which means that the right to vote in it is not valuable. This explains the findings of the second line of scholarship and reconciles them with the first.[268]

In short, information is key to achieving a core outcome. Actors must know who holds all significant economic interests and control rights, both in order to facilitate these maneuvers, and to enable actors to realize that a core outcome has been reached. This analysis offers a new perspective on longstanding securities disclosure requirements.

C. Past and Future Effects of Existing Disclosure Rules

Disclosure rules are a longstanding cornerstone of modern securities regulation.[269] For example, U.S. securities laws require disclosures from key actors such as large shareholders,[270] institutional investors,[271] and corporate insiders.[272]

Before the development of large derivative markets, these disclosure rules created a reasonably comprehensive regulatory net that required

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[268] See Chung & Kim, supra note 262, at 37 (positing that minority shareholders' voting rights are essentially only valuable when separate management teams are competing to assemble smaller blocs of voting rights into a majority coalition to effect or bar a takeover); Zingales, The Value of the Voting Right, supra note 262, at 126–27 (similar); Zingales, What Determines the Value?, supra note 262, at 1048 (similar).

[269] See Bainbridge, supra note 95, at 1023 ("Mandatory disclosure is a—if not the—defining characteristic of U.S. securities regulation.").

[270] See, e.g., 15 U.S.C. § 78m(d)(1) (2006); Sec. Exch. Comm'n, Schedule 13D, available at http://secfile.net//d.pdf (for certain investors who own five percent or more of a class of registered equities with voting rights); Sec. Exch. Comm'n, Schedule 13G, available at http://secfile.net/forms/sched13g.pdf (similar but abbreviated disclosure form that certain investors can file).

[271] See, e.g., 15 U.S.C. § 78m(f)(1) (2006); Sec. Exch. Comm'n, Form 13F, available at http://sec.gov///f.pdf (for institutional investment managers with $100 million or more in specified assets under management).

[272] See, e.g., 15 U.S.C. § 78p(a)(1) (2006); Robert A. Friedel & Andrew L. Romberger, Corporate and Securities Law Update: Expedited Disclosure of Insider Transactions Under Section 16, Pepper Hamilton LLP (Aug. 28, 2002), http://pepperlaw.com/publications_update.aspx?ArticleKey=150 (discussing disclosure rules applicable to directors, executive officers, and other insiders).

shareholders to disclose their holdings. These disclosures largely revealed the portfolios of major market participants. Accordingly, major market participants could generally discern what each other's ownership and control rights were. Thus, the core outcome model would seem to apply well, and one would predict that financial markets would be efficient and stable.

These disclosure obligations generally were not crafted with derivatives in mind.[273] But, because derivatives markets were small compared to public equities markets at the time,[274] this gap in the regulatory net was of relatively little consequence: An actor's shareholdings generally determined both her economic and control rights. Thus, imposing disclosures on shareholders was sufficient. Derivatives were a complication that could safely be ignored.

Our theory predicts that, as derivatives markets continue to grow, decoupling should become easier, and ownership and control should diverge even further.[275] In the absence of disclosure, this could lead to many non-core outcomes. The best available evidence to date suggests that this prediction is being borne out in practice.[276] The question then becomes how regulators should respond.

D. Responses to Derivatives Market Growth

We now consider three of the most widely suggested responses to growing derivatives markets and the decoupling they engender: suppressing derivatives markets, imposing disclosure obligations, and moving derivatives trading to an exchange. We address each in turn.

1. Suppressing Derivatives Markets

One proposed approach is to suppress derivatives markets, either by severely restricting derivatives or banning them altogether.[277] This ap-

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[273] Hu & Black, supra note 2, at 836–37.

[274] See supra notes 71–74 and accompanying text.

[275] See Companion Paper, supra note 27, at 3.2, 4.2.

[276] Cf. Hu & Black, supra note 1, at 661 tbl.1 (collecting many decoupling examples).

[277] See, e.g., Alan Kohler, Derivatives Should Just Be Banned, Bus. Spectator (Aug. 22, 2012, 7:53 AM), http://businessspectator.com.au/article/2012/8/22/global-financial-crisis/derivatives-should-just-be-banned; Matthew Leising & Alan Bjerga, Peterson Says "Naked" Credit Swaps Ban Not Permanent (Update2), Bloomberg (Feb. 3, 2009), http://bloomberg.com/apps/news?pid=21070001&sid=asrUxRMjdpMQ (discussing a proposal to ban a broad class of derivatives put forth by Collin Peterson, then-Chairman of the House Agriculture

proach seeks to return the markets to the days when derivatives markets were sufficiently small that they could mostly be ignored.

Commentators have largely panned such proposals.[278] They argue that derivatives allow investors to hedge their risks at lower cost than would otherwise be possible, and that they increase markets' efficiency.[279] Moreover, they argue that even if eliminating derivatives were desirable, it would be impossible to do so without inflicting tremendous violence on the financial markets.[280]

Our analysis does not support a severe curtailment of derivatives, for two chief reasons. First, such a drastic measure is not necessary; core outcomes are fully compatible with large derivatives markets. As noted earlier, the key to a core outcome is that the market must be sufficiently transparent for market actors to predict the decisions that firms will make.[281] Thus, the issue is not the size of derivatives markets, but their opacity. Shrinking derivatives markets instead of illuminating them is, at best, a second-best solution.

Second, blanket restrictions on derivatives transactions ignore important potential efficiency benefits that derivatives offer. As noted earlier, the classical theory of shareholder voting generally assumes that regulations align the interests of individual corporations with those of society at large.[282] In practice, however, regulations often fall short of this ideal. This leaves a wedge between the interests of individual corporations and those of society, which can lead to inefficient results. Derivatives, and the decoupling they enable, can make it easier for the actors who would be hurt by the firm's actions to steer the company toward a more socially beneficial decision. In

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Committee, which has jurisdiction over commodities markets); James Rickards, Derivatives Should Be Banned from Financial Markets, U.S. News & World Rep. (July 26, 2012), http://www.usnews.com/opinion/blogs/economic-intelligence/2012/07/16/derivatives-should-be-banned-from-financial-markets.

[278] See, e.g., Paco Ahlgren, Banning Derivatives and Other Such Foolishness, Seeking Alpha (Nov. 16, 2009, 11:01 AM), http://seekingalpha.com/article/173562-banning-derivatives-and-other-such-foolishness; Richard Livingston, Derivatives Should Not Be Banned, Bus. Spectator (Aug. 27, 2012, 8:13 AM), http://www.businessspectator.com.au/article/2012/8/27/exchange-rate/derivatives-should-not-be-banned; Leslie Patton, US Warns EU Derivatives Ban Won't Work, Associated Press Newswires (Mar. 16, 2010, 2:22 PM), available at Factiva, Doc. No. APRS000020100316e63g001dc.

[279] See Partnoy, supra note 67, at 4–5; Myron S. Scholes, Global Financial Markets, Derivative Securities, and Systemic Risks, 12 J. Risk & Uncertainty 271, 271–73 (1996).

[280] See sources cited supra note 278.

[281] See supra Sections IV.A–B.

[282] See supra Section I.D.

other words, a large derivatives market may serve as a private backstop to regulation: It can benefit society by increasing private actors' ability to block socially inefficient actions that regulation would allow.

To illustrate this, we return to our example from Section I.E, in which shareholders of widget manufacturer AcmeCo are considering a takeover offer from rival widget manufacturer BuyerCo. After the takeover, BuyerCo will be a monopolist. This will benefit AcmeCo and BuyerCo shareholders, at the expense of CustomerCo, the chief purchaser of widgets.[283] Because the costs to CustomerCo exceed the benefits to AcmeCo and BuyerCo,[284] the takeover is not socially beneficial,[285] and should be barred by antitrust regulators.[286]

But if regulators do not act, decoupling offers CustomerCo an avenue to block the transaction. CustomerCo can acquire a large share of the control rights in AcmeCo and vote against the takeover offer from BuyerCo. This empty voting allows CustomerCo to avoid the large losses it will suffer if it has to pay higher prices for widgets. Shrinking derivatives markets would make it more difficult for CustomerCo to do this.

2. Disclosure Requirements

Several commentators have advocated for increased disclosure requirements for derivatives holdings.[287] One advantage of disclosure is that it would make it much easier for regulators to determine the frequency of empty voting and hidden ownership, and in what circumstances they are being employed.[288] Moreover, disclosure requirements would presumably increase the transparency of derivatives markets and of financial markets more generally.[289] Our core outcome analysis suggests that this increased transparency could improve market outcomes.[290]

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[283] See Barry, supra note 123, at 597–99.

[284] Posner, supra note 93, at 357–60.

[285] Again, we assume the industry is not characterized by efficient monopoly. See id. at 459–62.

[286] See id. at 387–90.

[287] See, e.g., Hu & Black, supra note 1, at 682–94; Hu & Black, supra note 2, at 875–86; Wolf-Georg Ringe, Hedge Funds and Risk Decoupling: The Empty Voting Problem in the European Union, 36 Seattle U. L. Rev. 1027, 1087–88 (2013).

[288] Hu & Black, supra note 2, at 875–86.

[289] We do not discuss the important practical question of how best to design a well-functioning disclosure system. We note that other commentators have carefully considered this issue and have put forth detailed proposals. See, e.g., Hu & Black, supra note 1, at 682–94; Hu & Black, supra note 2, at 875–86.

[290] See supra Section IV.A.

However, mandated disclosure could be unnecessary; market participants may have incentives to disclose the requisite information voluntarily. Nevertheless, we do not believe that voluntary disclosures will generally provide sufficient information to sustain core outcomes. Accordingly, mandatory disclosure rules have the potential to provide significant benefits.

First, observe that actors will typically have many reasons to conceal their portfolios. Some of these are wholly legitimate, such as the desire to protect proprietary trading strategies or discourage certain types of predatory trading behavior.[291] Actors may also have less savory reasons for secrecy. For example, as noted earlier, an actor who can disguise what she is doing from her counterparties may be able to reap very large profits through the Bet and Switch strategy.[292] Actors generally do not publicly disclose their portfolios voluntarily.

In the absence of public disclosures, it may be quite costly for actors to gather information about each other's holdings. If there are multiple actors, each will have incentives not to make investigations in order to avoid these costs, hoping that other actors with similar interests will do the work instead. This is another example of the free-rider problem discussed earlier.[293]

Even if an actor will not investigate the interests of all other major actors in the market, one might reason that she would require disclosure from her counterparties. This would seem a particularly natural response if she is concerned that her counterparties may be taking advantage of her, via the Bet and Switch strategy or otherwise.[294] One might hope that counterparty disclosure would provide enough market transparency to support core outcomes.

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[291] Because securities markets are imperfect, if an investor is acquiring (selling) a very large position in a company, the market price will often rise (fall) in the short run. Some traders may seek to trade on this knowledge, pushing prices further up (down), at the expense of the original investor. Thus, it often behooves the original investor to keep her actions quiet.

[292] See supra Sections II.B and III.A.

[293] See supra Section I.E; see also Bainbridge, supra note 28, at 35–38 (discussing free-rider problems among shareholders). This dynamic is particularly likely to manifest itself when a single actor has a concentrated economic interest while the countervailing economic interest is dispersed across multiple actors. See Mancur Olson, Jr., The Logic of Collective Action: Public Goods and the Theory of Groups 5–52 (1971) (analyzing this dynamic).

[294] Cf. Akerlof, supra note 256, at 489–92, 499–500 (demonstrating how quality uncertainty leads either to the unraveling of the market or the rise of "counteracting institutions" like seller guarantees and brand names).

Unfortunately, this is not the case. Even if counterparties always demand fulsome disclosure,[295] that does not guarantee that the parties will reach a core outcome. A party with a large economic interest in a particular outcome may be able to promote that outcome without having to deceive her counterparties. By sharing her gains, she can co-opt her counterparties; she can make them better off when her preferred outcome is achieved, which makes her counterparties promote that outcome, even if it is not efficient.

This is precisely the situation contemplated in our previous example from Section IV.B.[296] There, FirmCo was considering a takeover offer from GiantCo that was good for FirmCo and for society, but bad for GiantCo. Initially, Bob, who had control of FirmCo, favored the takeover. But Carol, who held only GiantCo shares, was subsequently able to trade with Bob in ways that aligned their incentives, potentially causing Bob to prefer that the takeover fail. Carol and Bob together could then cause FirmCo to reject the takeover offer. This would result in an inefficient outcome that imposed great costs on Alice, who owned only FirmCo shares.

Counterparty disclosure could not prevent this inefficient outcome. Bob and Carol benefit from the trade; each is better off afterward than she was initially. Disclosure between Bob and Carol will not change their behavior. Alice is the one who needs to know about Bob and Carol's trade; she is the one who is hurt by it, and she is the one with incentives to block the trade or promote additional transactions to move the market back to an efficient outcome. But, because Alice is not involved in the initial transaction between Bob and Carol, counterparty disclosure will not inform her of the trade.

Thus, we believe that mandated disclosure will produce more transparency than voluntary disclosures alone, and that this will promote core outcomes. However, mandatory disclosure may reduce efficiency by discouraging actors from gathering information. The basic logic is as follows: Collecting and processing information is costly. Parties are in-

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[295] These types of disclosures are not a common general practice in securities trades. There have been instances in which traders successfully deployed and profited from deceptive tactics, even when counterparties were primed to expect them. See Partnoy, supra note 67, at 21–23 (discussing examples of successful misdirection in unregulated markets); see also id. at 254 ("[F]unds said they needed to keep their strategies secret or other investors would mimic them, thereby eroding the profit opportunities.").

[296] See supra notes 258–61 and accompanying text.

duced to collect and process information by the prospect of using that information to enter into advantageous transactions with others who are less informed. Disclosure regimes enable other parties to learn of the new information earlier than they would otherwise, reducing the initial incentive to gather information and therefore market efficiency.[297]

This concern has produced a longstanding debate about the value of mandating disclosure.[298] We do not attempt to resolve this debate here. Instead, we simply note that, under our analysis, the arguments in favor of imposing disclosure requirements on derivatives holders mirror those for imposing them on stockholders. If these requirements, fundamental to modern securities regulations worldwide, are valuable, then we believe that mandatory disclosures for derivatives holders are likely to be valuable as well.

Finally, if one is concerned that disclosure requirements may reduce incentives to gather information, one might wish to consider imposing retroactive disclosure requirements. This would not facilitate reaching core outcomes, but would allow regulators to monitor the frequency of and the circumstances surrounding decoupling, without diminishing parties' incentives to gather information.[299]

3. Derivatives Exchanges

Historically, derivatives transactions have primarily been conducted "over-the-counter"—an investor who wants to acquire a derivative goes to an investment bank and privately negotiates a contract. Almost all

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[297] See, e.g., Easterbrook & Fischel, supra note 94, at 1166 n.15, 1178–79; Schwartz, supra note 94, at 230.

[298] See, e.g., George J. Benston, Corporate Financial Disclosure in the UK and the USA 150–53 (1976); George J. Benston, The Costs and Benefits of Government-Required Disclosure: SEC and FTC Requirements: An Appraisal, *in* Corporations at the Crossroads: Governance and Reform 37, 67–69 (Deborah A. DeMott ed., 1980); Henry G. Manne, Economic Aspects of Required Disclosure Under Federal Securities Laws, *in* Wall Street in Transition: The Emerging System and Its Impact on the Economy 21, 23–28 (Henry G. Manne & Ezra Solomon eds., 1974); George J. Benston, Required Disclosure and the Stock Market: An Evaluation of the Securities Exchange Act of 1934, 63 Am. Econ. Rev. 132, 132 (1973); George J. Benston, The Value of the SEC's Accounting Disclosure Requirements, 44 Acct. Rev. 515, 515 (1969); John C. Coffee, Jr., Market Failure and the Economic Case for a Mandatory Disclosure System, 70 Va. L. Rev. 717, 721–23 (1984); George J. Stigler, Public Regulation of the Securities Markets, 37 J. Bus. 117, 117–18 (1964).

[299] Disclosure could potentially be paired with some sort of ex post penalty in appropriate cases. Cf. Partnoy, supra note 101, at 253–54 (suggesting that ex post discipline by courts can improve ex ante incentives with respect to derivatives).

transactions in over-the-counter markets occur in private; thus, they are largely opaque.[300] Commentators have proposed regulations that would move derivatives trading to an exchange or some other centralized public platform.[301] Indeed, a significant portion of the Dodd-Frank Wall Street Reform and Consumer Protection Act, the massive recent securities regulation bill, is devoted to moving certain over-the-counter derivatives markets onto exchanges.[302]

Exchanges offer more transparency than over-the-counter markets. Trades occur via a centralized hub, giving parties more information about asset prices and the volume of trading over time. Thus, it seems likely that moving derivatives to an exchange would give parties more access to information. But, as noted earlier, to reliably support core outcomes, major actors must know each other's economic interests and control rights.[303] Publicizing market prices, or the volume of trades taking place on a given day, would not provide actors with this knowledge. Consequently, moving derivatives markets to public exchanges, by itself, likely would not provide sufficient information to guarantee core outcomes.[304]

However, moving derivatives trading, to a centralized platform could be a meaningful part of a larger plan to introduce transparency. For example, if transactions must be conducted through an exchange, the exchange would be a party to all transactions. Accordingly, it could potentially keep an automated, up-to-the-minute account of all parties' positions. If this information were made publicly available, all parties would have the information they need to reach and recognize core outcomes.

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[300] See Comm. of Eur. Sec. Regulators, supra note 75, at 14 (finding that equity derivatives are the least standardized and thus are particularly opaque).

[301] See, e.g., id. at 28; Viral V. Acharya et al., Centralized Clearing for Credit Derivatives, *in* Restoring Financial Stability: How to Repair a Failed System 251, 251 (Viral V. Acharya & Matthew Richardson eds., 2009).

[302] See Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, tit. 7, 124 Stat. 1376, 1641–1802 (2010); Azam H. Aziz et al., A Corporate End-User's Handbook for Dodd-Frank Title VII Compliance (Version 2.0) 3–4 (Dec. 14, 2012), available at http://www.shearman.com/files/Publication/9f6be0f7-d19b-4fd9-ac78-bbdab2499906/Presentation/PublicationAttachment/08fda0e3-1017-4fb4-ba7e-987ad4d75a87/Corporate-End-Users-Handbook-for-Dodd-Frank-Title-VII-Compliance-Ver-2-FIA-121712.pdf.

[303] See supra note 256 and accompanying text.

[304] It may be beneficial for other reasons, however. See Comm. of Eur. Sec. Regulators, supra note 75, at 27–28; Acharya et al., supra note 301, at 252–54.

E. Corporate Voting Rules

Commentators have proposed a variety of changes to corporate voting rules to address decoupling. Core outcome analysis yields new insights into these proposals and suggests new avenues that might be productive.

Commentators have proposed barring actors with a negative economic interest in a company from exercising control rights over that company.[305] Such prohibitions make sense if one believes that the decisions that maximize the firm's value also maximize social welfare.[306] However, this approach would encourage inefficient outcomes when the decisions that are best for the firm are not socially optimal. Thus, under the core outcome framework, the merits of this approach depend on the degree to which other regulations are efficient.

The same issue arises with respect to commentators' suggestion that companies can manage decoupling through corporate charter provisions.[307] For example, a charter that barred shareholders with negative economic interests from voting in corporate elections would promote shareholder voting that maximized the corporation's value. If the corporation's interests conflict with society's, however, such a provision would be likely to lower social welfare.[308]

Our analysis also has important implications for the design of other legal rules. There are times in corporate law when a small group of shareholders can block an action. These low thresholds make the Bet and Switch strategy more attractive.[309] Allowing a small percentage of outstanding shares to block a transaction also puts more pressure on disclosure rules: Uncertainty with respect to the identity and incentives of relatively few small shareholders can create uncertainty about the firm's decision. Thus, more disclosure is necessary to ensure a core outcome.

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[305] See, e.g., Martin & Partnoy, supra note 11, at 793 ("At a minimum, shareholders with substantial short positions should not be entitled to vote.").

[306] We note that the practical implementation and administration of such a rule could be difficult. Investors with interests in a company's competitors, clients, or suppliers could all have positive or negative economic interests in the company, depending on the circumstances. Cf. Ringe, supra note 287, at 1109–12 (suggesting that this could be managed by giving a regulator the power to suspend voting rights in individual cases, at its discretion).

[307] See Hu & Black, supra note 1, at 697–701.

[308] It could even lower shareholders' welfare as a class if shareholders' non-shareholder interests dominate. For example, this could happen if a firm had numerous shareholders, each of which held few shares, and the firm's inefficient action significantly affected the shareholders as employees or consumers.

[309] This assumes that the market expects the transaction to occur.

For example, in some jurisdictions, an acquirer who purchases a sufficient percentage of outstanding shares can force the remaining shareholders to sell. In Australia, the necessary ownership threshold is 90%.[310] In 2005, Cleveland-Cliffs attempted to acquire Portman Mining, an Australian company.[311] Seneca Capital, a hedge fund, moved surreptitiously to acquire a blocking interest.[312] Ultimately, the two parties struck a deal.[313] Although this illustrates how voluntary transactions can move a non-core outcome to a core outcome, this negotiation might not have been necessary if the minimum ownership threshold were lower.

To take another example, some jurisdictions require minority shareholders to overwhelmingly approve a takeover offer from a majority shareholder.[314] In the Henderson Investment transaction discussed previously,[315] 90% of the outstanding minority shares were needed to approve the transaction. Since Henderson Land owned over 70% of Henderson Investment's shares, an investor could acquire the power to prevent the transaction by amassing less than 3% of the outstanding shares.

Such circumstances seem ripe for mischief.[316] In theory, the core outcome framework predicts that disclosure is sufficient to correct this problem. But, since any disclosure regime will always fall short of the ideal, it may be wise to eschew rules that enable such a small percentage of outstanding shares to change outcomes. We further explore differences between our idealized models and real-world markets below.

V. FURTHER CONSIDERATIONS

Our formal models make several simplifying assumptions, chiefly with respect to transaction costs and information. We now explore the

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[310] See Bryan Frith, Broker Goes for Broke on Portman Bid, Australian, Apr. 8, 2005, at 18, available at Factiva, Doc. No. AUSTLN0020050407e1480004a.

[311] Id.; Bryan Frith, Cliffhanger as Clock Ticks in Portman Bid, Australian, Mar. 17, 2005, at 24, available at Factiva, Doc. No. AUSTLN0020050316e13h0002f.

[312] Bryan Frith, Hauling Equity Swap Disclosure Over Coals, Australian, June 8, 2005, at 36, available at Factiva, Doc. No. AUSTLN0020050607e1680006b.

[313] Id.

[314] Several U.S. states have enacted anti-takeover statutes that temporarily prevent an acquirer from taking certain actions without a supermajority vote of minority shareholders. See John C. Anjier, Comment, Anti-Takeover Statutes, Shareholders, Stakeholders and Risk, 51 La. L. Rev. 561, 569–70 (1991); id. at 579 & n.102 (listing nineteen states that enacted anti-takeover statutes "at the behest of a single corporation").

[315] See supra notes 1–7 and accompanying text; see also Cheng, supra note 4.

[316] The same is true of rules that allow a very small percentage of shares to approve an action, but such rules are uncommon.

degree to which these assumptions diverge from reality and how sensitive our analysis is to these assumptions.

A. Transaction Costs

Our competitive equilibrium and core outcome models assume away transaction costs.[317] This is a common modeling assumption that is never strictly true in reality.[318] There are two types of transaction costs that we believe may have significant real-world effects.

First, buying and selling shares can entail commissions, fees, and other monetary costs.[319] As transactions get large enough, counterparties become more difficult to come by, further raising costs.[320] The real-world effect of these costs is reduced trading. This makes the Bet and Switch strategy less appealing and generally makes the market more stable. In practice, this means that these transaction costs render competitive equilibrium analysis somewhat more meaningful.[321]

Similarly, by making trading more difficult, these transaction costs undermine the core outcome framework's guarantee of efficiency. They also weaken its predictive power. Intuitively, because transaction costs make it less likely that the parties will trade their way to an efficient outcome, they increase the likelihood that the market will remain "stuck" at an inefficient result.

In short, these transaction costs help explain why decoupling is not even more common than it currently is. These costs are often low, however, and they have been dropping for a long period of time. For an institutional investor, the costs of buying and selling stock in a large, public company are on the order of 0.1% of the stock's price.[322] And, as exchanges become more automated and derivatives markets continue to

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[317] See generally Companion Paper, supra note 27.

[318] Cf. Coase, supra note 52, at 15–16 (exploring the results that would follow if this assumption were literally true in reality).

[319] See Burton G. Malkiel, The Efficient Market Hypothesis and Its Critics, 17 J. Econ. Persp. 59, 62 (2003) (discussing how such transaction costs can prevent investors from profiting from small-scale market inefficiencies).

[320] We note that, ultimately, one can only acquire control rights from someone who currently holds them. By contrast, an investor can acquire economic rights by entering into a cash-settled derivative with anyone. Thus, there may be larger transaction costs in the market for control rights than in the market for ownership rights.

[321] This is somewhat surprising, since transaction costs generally impede markets from reaching competitive equilibria. See Coase, supra note 52, at 15–16.

[322] Welch, supra note 65, at 244.

grow, these costs will shrink even further.[323] Accordingly, we do not believe it wise to place much reliance on these costs when formulating policy.

Second, actors face transaction costs when they seek to coordinate their behavior.[324] To illustrate why these costs can be problematic, suppose once again that FirmCo is considering a takeover offer from GiantCo. Assume that the takeover is bad for FirmCo, but that it is good for both GiantCo and society—in other words, that it is efficient.[325] Suppose that Alice owns 100 shares of FirmCo and controls FirmCo's decision, but that she has no shares of GiantCo. Meanwhile, 100 other investors each own a single share of GiantCo. It is efficient for FirmCo to accept the takeover offer, but, given Alice's initial portfolio, it is not in her interest. If there are no transaction costs, GiantCo's 100 shareholders can band together and correct the inefficiency.[326] In practice, however, organizing GiantCo's 100 small shareholders entails costs.[327] These costs may be prohibitive,[328] and the market may remain at an inefficient outcome.[329]

It is unclear how frequently this dynamic currently plays out in practice. Most small securities investors invest through institutional intermediaries such as mutual funds, pension funds, and other financial services providers.[330] Thus, forming coalitions may not be a matter of organizing thousands of small investors, but merely organizing a much smaller

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[323] See supra Section I.C.

[324] This problem is related to the free-rider phenomenon. See supra Sections I.E and Subsection IV.D.2.

[325] For an example of this, see supra Table 1.

[326] Continuing with the example in Table 1, each GiantCo shareholder could agree to pay Alice $9 if she causes FirmCo to accept GiantCo's offer. This would offset her $8 per share loss if FirmCo accepts, while leaving GiantCo's shareholders with a profit of $6 per person.

[327] There have been instances in which investors have succeeded through similar approaches. See Katherina Glac, The Influence of Shareholders on Corporate Social Responsibility 4–14 (Ctr. for Ethical Bus. Cultures, History of Corporate Responsibility Project, Working Paper No. 2, 2010), available at http://www.cebcglobal.org/uploaded_files/Glac_paper_on_Social_Investment_FINAL.pdf (giving a brief history of shareholder activism and discussing how environmentalists used shareholder voting mechanisms to effect policy changes at Amoco in the 1990s).

[328] Such a scenario also raises fairness concerns if the winners are likely to be larger and more sophisticated than the losers. See supra Section I.D.

[329] The market may also be shifted to an inefficient outcome in a similar manner.

[330] Cf. Changes in U.S. Family Finances from 2007 to 2010: Evidence from the Survey of Consumer Finances, Fed. Res. Bull. (Bd. of Governors of the Fed. Res. Sys.), June 2012, at 24 tbls.5–6, available at http://www.federalreserve.gov/Pubs/Bulletin/2012/PDF/scf12.pdf.

group of sophisticated intermediaries—a far less daunting task.[331] In-creased disclosure of derivatives holdings would help policymakers to assess the scope of this problem in practice. If this dynamic occurs fre-quently, policymakers may wish to consider tailored regulations that on-ly restrict actors' ability to engage in decoupling transactions in these sorts of instances.[332]

B. Information

Our models make two key assumptions with respect to information. The first is that all parties know and agree upon each asset's value under every firm's potential decision. In reality, however, actors' value esti-mates are likely to diverge somewhat.

Variation among actors' value estimates is not a fundamental problem for our approach. In a companion paper, we show that, when parties have a range of beliefs about values, the core outcome model's predic-tions remain intact with only slight modifications.[333] More specifically, the market reaches the outcome expected to be efficient, given the par-ties' various beliefs.[334] As long as the parties' beliefs about values are correct on average, the model's predictions are largely unaffected.[335]

Our core outcome model makes a second information assumption as well: It assumes that actors know the contents of each other's portfolios, and thus the payoffs they will receive depending on the decisions that firms make. This assumption is potentially problematic.

Even if there are disclosure requirements, investors will not know ex-actly what each other's economic interests are. First, any real-world dis-closure system is likely to be imperfect;[336] thus, investors will have in-complete information about each other's portfolios. But even if investors

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[331] See Olson, supra note 293, at 1–3.

[332] We note that this is broadly consistent with the SEC's investor protection mandate. See The Investor's Advocate: How the SEC Protects Investors, Maintains Market Integrity, and Facilitates Capital Formation, Sec. Exch. Comm'n, http://sec.gov/about/whatwedo.shtml (last modified Mar. 8, 2013).

[333] See Companion Paper, supra note 27, at 5.

[334] Id. at 5 Theorem 5.1. Alternatively, the core outcome model holds up if actors' beliefs are incorrect, but are the best predictors of value available.

[335] Id. at 5.

[336] For example, some types of investments may not need to be disclosed. See Hu & Black, supra note 2, at 866 tbl.3 (illustrating how U.S. disclosure laws do not require complete dis-closure of all potentially relevant interests). Even if disclosures are perfect, some actors may not stay abreast of them.

know the contents of each other's portfolios, they still may not know all of each other's economic interests. For example, an employee holding stock in her employer may be inclined to vote against a takeover that is in her interest as an investor out of concern that the takeover could lead to layoffs.[337] Similarly, an investor who has a client relationship with a firm may vote with management to protect that relationship, even if it cuts against her interests as an investor.[338] It would be quite difficult to construct an efficient disclosure regime that captured all of these types of interests.

These uncertainties compound each other. For example, suppose Alice owns stock in a corporation and its largest customer, but has a negative economic interest in its largest supplier. It may be difficult for other actors to anticipate how Alice will vote in a particular instance. It will be even more challenging if some of Alice's interests are not disclosed, or if opinions differ as to how a decision will affect these various firms.

Uncertainty about separate blocs of voters magnifies uncertainty about the ultimate outcome of the shareholder vote. For example, suppose that the interests of voters holding 5% of control rights are uncertain, so that one cannot predict their votes. In order to be confident that a measure will pass,[339] one must be confident that slightly more than 50% of the remaining voters will vote in favor of it.[340] But, if 25% of voters' interests are unclear, one must have confidence that the remaining voters favor the measure by a two-to-one margin—a much higher threshold.[341]

Thus, these factors multiply the uncertainty that actors face in the marketplace, undermining the conclusions of the core outcome framework. Yet, as long as actors' information is good enough—meaning that

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[337] Acquirers often dismiss or displace many target managers and employees. Jonathan R. Macey & Geoffrey P. Miller, Universal Banks Are Not the Answer to America's Corporate Governance "Problem": A Look at Germany, Japan, and the U.S., *in* The Revolution in Corporate Finance 552, 563 (Joel M. Stern & Donald H. Chew, Jr. eds., 4th ed. 2003).

[338] See BNS Post Says U.S. Hedge Fund Looks to Block Sears Deal, supra note 88.

[339] Or, alternatively, that it will fail.

[340] To be confident that shareholders will choose a particular option, one must be confident that more than 50% of outstanding votes will be cast in favor of that option. If 5% of votes cannot be predicted, then the requisite support must come from the other 95% of votes outstanding. Thus, one must have confidence that approximately 52.6% of this latter pool of voters favors a particular outcome, a relatively slight increase above 50%.

[341] Again, one must be confident that more than 50% of outstanding votes will be cast in favor of the relevant option. If 25% of votes cannot be predicted, then the requisite support must come from the other 75% of votes outstanding. Thus, one must have confidence that about 66.7% of this latter pool of voters favors a particular outcome.

they have a reasonable sense of other actors' interests in a large enough percentage of cases—the core outcome model's predictions will endure.[342] Those instances in which disclosure is not likely to meet this threshold may be most suitable for substantive regulatory intervention.

CONCLUSION

Core outcome analysis gives significant insight into the thorny and increasingly prevalent issue of decoupling. Shifting away from competitive equilibrium analysis and toward core outcome analysis offers policymakers and scholars a number of benefits. Competitive equilibria lose most of their desirable properties when control rights are introduced, and generally cease to exist at all when derivative markets grow large. Core outcomes, on the other hand, always exist, are always efficient, are stable, resemble observed real-world behavior, and provide clear predictions.

Information is the key to achieving core outcomes. More specifically, major actors must have knowledge of each other's economic and control rights. If actors have this knowledge, decoupling will occur in those situations in which it is socially beneficial, and only in those situations. Since private parties generally will not choose to share the requisite information on their own, core outcome analysis provides a strong justification for a comprehensive mandatory disclosure regime for securities and derivatives markets.

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[342] In addition, this problem may be reduced to the extent that one has confidence that a certain percentage of the unknown votes will be cast in a particular way. For example, suppose it is unclear who owns 10% of outstanding shares. If one believes that at least 25% of those shares will be voted in favor of a proposed transaction, then the transaction will be approved as long as 52.78% of the remaining 90% of shares outstanding are voted in favor of it (52.78% * 90% = 47.5%). However, if the ownership of those shares is unclear, it may be quite difficult to predict how they will be voted with much confidence.

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