

2008

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Recommended Citation

Shadab, Houman B., "Innovation and Corporate Governance: The Impact of Sarbanes-Oxley" (2008). *Articles & Chapters*. 1098.
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INNOVATION AND CORPORATE GOVERNANCE: THE IMPACT OF SARBANES-OXLEY

Houman B. Shadab*

In 2006, Apple began shipping certain Mac computers without informing customers that the computers were equipped with the latest innovation in wireless technology, the 802.11n wireless card. Later, Apple revealed that these computers were enabled to use the wireless card, but that customers would have to pay \$1.99 to download software to activate the technology. In response to customer demands for an explanation, an Apple spokesperson explained that, due to accounting rules mandated by federal corporate governance law, the company was required to charge a nominal fee for the software because it had already recognized revenue on the computers when they first began to ship.¹ This incident demonstrates that there is a subtle yet powerful relationship between innovation and corporate governance. This Article examines that relationship.

Analysis of the relationship between innovation and corporate governance is timely, as scholars and policymakers continue to debate the impact of the corporate governance changes brought about by the Sarbanes-Oxley Act of 2002 (“SOX”).² In response to several corporate

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1. Jacqui Cheng, *Apple Confirms 802.11n Fee, But for Less Than Expected*, INFINITE LOOP, Jan. 18, 2007, <http://arstechnica.com/journals/apple.ars/2007/1/18/6679>; Tom Krazit, *Apple's 802.11n Accounting Conundrum*, CNETNEWS.COM, Jan. 19, 2007, http://www.news.com/Apples-802.11n-accounting-conundrum/2100-1044_3-6151790.html.

2. See, e.g., LUIGI ZINGALES ET AL., INTERIM REPORT OF THE COMMITTEE ON CAPITAL MARKETS REGULATION 29-39, 131-34 *2006), available at http://crapo.senate.gov/documents/committee_capmarkets_reg.pdf (finding that U.S. capital markets have become less competitive post-SOX and recommending reforms to reduce the costs of SOX's internal control provisions); Christian Leuz, *Was the Sarbanes-Oxley Act of 2002 Really this Costly? A Discussion of Evidence from Event Returns and Going-Private Decisions*, 44 J. ACCT. & ECON. 146 (2007) (reviewing studies finding that SOX imposes substantial costs on public companies and arguing that such costs may not be attributable to SOX and therefore that the conclusions of the studies are premature); Kate Litvak,

governance failures in 2001 and 2002, Congress enacted SOX to reduce management's ability to abuse accounting rules or otherwise act opportunistically at the expense of investors. SOX increases monitoring over corporate executives, requires more extensive internal control over financial reporting, and stiffens civil and criminal penalties for fraud and other violations of the federal securities laws.³ This Article finds that, by tilting corporate governance toward more objective monitoring by outsiders and thereby restricting subjective decision making by insiders, SOX likely reduces the innovative potential of a significant portion of public companies, and this, in turn, may impose a cost on society in the form of foregone benefits from innovation.

Previous evaluations of SOX have not addressed the law's impact on innovation as undertaken by established public corporations. To the extent that other studies have focused on SOX's impact on innovation, they examined SOX's potential to undermine the growth of small, entrepreneurial companies by raising the barriers to access public capital markets.⁴ This is in part because corporate governance scholarship rarely analyzes innovation.⁵ By first examining the relationship between innovation and corporate governance, this Article provides new insights about the impact of SOX on innovation.⁶

Innovation is a process that results in new products, methods of

Sarbanes-Oxley and the Cross-Listing Premium, 105 MICH. L. REV. 1857, 1860-61 (2007) (finding that in the year SOX was passed the relatively higher price of foreign company shares that are subject to U.S. regulation through cross-listing decreased); Robert A. Prentice & David B. Spence, *Sarbanes-Oxley as Quack Corporate Governance: How Wise is the Received Wisdom?*, 95 GEO. L.J. 1843 (2007) (arguing that early criticisms of SOX are misguided and that SOX may have provided benefits); N. K. Chidambaram et al., *Does Better Corporate Governance "Cause" Better Firm Performance?* 6 (March 2007) (unpublished research paper, on file with Rutgers Business School), available at <http://www.isb.edu/SummerResearchConference/Chidambaram.pdf> (finding uniform corporate governance reforms of the type mandated by SOX likely made investors in some companies worse off).

3. See *infra* notes 136-152 and accompanying text.

4. See, e.g., Lynn Stephens & Robert G. Schwartz, *The Chilling Effect of Sarbanes-Oxley: Myth or Reality?*, CPA J., June 2006, at 14 (reporting on SOX's impact on 108 entrepreneurial technology companies).

5. See Marcela Miozzo & Paul Dewick, *Building Competitive Advantage: Innovation and Corporate Governance in European Construction*, 31 RES. POL'Y 989, 990 (2002) ("Research on the relationship between corporate governance and the process of innovation has been limited to date because the main theories of corporate governance do not integrate systematically an analysis of the economics of innovation.").

6. As noted by a January 2008 advisory committee report to the U.S. Secretary of Commerce, research on the relationship between SOX and innovation is lacking. THE ADVISORY COMMITTEE ON MEASURING INNOVATION IN THE 21ST CENTURY ECONOMY, INNOVATION MEASUREMENT: TRACKING THE STATE OF INNOVATION IN THE AMERICAN ECONOMY 12 (2008), available at <http://www.innovationmetrics.gov/Innovation%20Measurement%2001-08%20rev%20040908.pdf>.

production, and forms of business organization. Innovation can vastly improve the welfare of consumers, investors, firms, and the economy. Consumers are better off when innovation results in higher quality goods and services or entirely new methods of production and distribution. In 2006 alone, a record 182,000 new consumer products were introduced globally.⁷ Investors also benefit when successful innovation increases the price of their shares. Companies perform better when they successfully innovate, contributing to the health of the economy and raising standards of living.⁸ Yet, innovation is not without risk. Overspending on research and development (“R&D”), for example, can destroy value to the detriment of employees and investors. A short-term gain from innovation may be squandered if it is mismanaged or quickly copied by rivals.⁹ Nonetheless, given the widespread economic benefits derived from innovation, SOX’s impact on innovation by public companies is a cause for concern.

To understand the relationship between innovation and corporate governance, Part I examines the defining characteristics of innovation as it is undertaken by established corporations. Innovation is ultimately the product of new knowledge and arises in response to economic change. Corporate entrepreneurship activities, such as strategic renewal, which enable companies to innovate the way they are organized, also facilitate innovation. Innovation requires companies to commit to long-term risky activities and coordinate the activities of employees throughout the organization.

Based upon the characteristics of innovation and innovative firms, Part II finds that governance structures, such as decentralization and an emphasis on strategic internal control, facilitate innovation. The ultimate purpose of such innovation-facilitating structures is to prevent managers from focusing too much on relatively short-term and more readily-quantifiable performance measures (myopia) and instead undertake the long-term, risky, dynamic, and knowledge-intensive activities that result in innovation. Innovation-facilitating structures and activities may, however, also increase the ability of managers to benefit themselves at the expense of

7. Press Release, Mintel International Group, Record-Breaking Number of New Products Flood Global CPG Shelves (Jan. 23, 2007), available at http://www.mintel.com/press_release.php?id=254053.

8. See Bart Verspagen, *Innovation and Economic Growth*, in THE OXFORD HANDBOOK OF INNOVATION 487 (Jan Fagerberg et al. eds., 2005) (reviewing the literature on the relationship between economic growth and innovation).

9. See CLAYTON M. CHRISTENSEN, THE INNOVATOR’S DILEMMA 111-256 (Collins Business Essential 2005) (1997); see also William Lazonick, *The Theory of the Innovative Enterprise* 3 (INSEAD, Working Paper No. 2001/15/SM), available at <http://ged.insead.edu/fichiersti/inseadwp2001/2001-15.pdf> (finding that innovations may place innovating firms at a cost disadvantage relative to rivals because “innovative strategies tend to entail higher fixed costs than the fixed costs incurred by [non-innovating] rivals”).

the company. Value-maximizing companies must therefore successfully negotiate the tradeoffs between reducing myopia and preventing managerial opportunism.

Part III examines how the structures mandated by SOX impact this tradeoff. SOX requires all public companies to increase objective monitoring of managers by outsiders to reduce opportunism. A substantial portion of innovative companies, however, maximize value by placing a greater emphasis on proximate monitoring by insiders than SOX permits. The law thus upsets the optimal governance balance in such companies, and likely undermines their ability to provide the most value to investors and consumers. In sum, innovation has specific characteristics which give rise to an important governance tradeoff, and SOX likely impacts this tradeoff to the detriment of innovation.

I. THE CHARACTERISTICS OF CORPORATE INNOVATION

Economic innovation is a process that ultimately results in something new and valuable to consumers. Successful innovation generally consists of discovering a new idea, developing it through a project, and then commercializing the idea for profit.¹⁰ Innovations include not only new products for consumers (i.e., goods and services), but also new methods of production and new forms of organization within firms.¹¹ Innovations may

10. See Jan Fagerberg, *Innovation: A Guide to the Literature*, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 4 (“Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry it out into practice.”); Federico Munari & Maurizio Sobrero, *Corporate Governance and Innovation*, in CORPORATE GOVERNANCE, MARKET STRUCTURE AND INNOVATION 3 (Mario Calderini et al. eds., 2003) (stating that innovation begins “with the generation of new knowledge targeted to the discovery of new products and processes, and ending with their commercial exploitation”); Barry Jaruzelski et al., *Smart Spenders: The Global Innovation 1000*, STRATEGY & BUS., Dec. 14, 2006, at 1, 4 (“[H]igh-leverage innovators and the companies with best overall performance distinguish themselves not by the money they spend, but by the capabilities they demonstrate in ideation, project selection, development, or commercialization”); Elizabeth Shaw et al., *Corporate Entrepreneurship and Innovation Part 2: A Role- and Process-Based Approach*, 8 EUR. J. INNOVATION MGMT. 393, 395 (2005) (stating that innovation involves an idea discovery phase and a commercialization phase).

11. See ISRAEL M. KIRZNER, DISCOVERY AND THE CAPITALIST PROCESS 85 (1985) (“*Innovative* activity consists in the creation . . . of an output, method of production, or organization not hitherto in use.”) (emphasis in original); MARY O’SULLIVAN, CONTESTS FOR CORPORATE CONTROL: CORPORATE GOVERNANCE AND ECONOMIC PERFORMANCE IN THE UNITED STATES AND GERMANY 12 (2000) (finding that innovation generates “higher quality and/or lower-cost products”); JOSEPH A. SCHUMPETER, THE THEORY OF ECONOMIC DEVELOPMENT: AN INQUIRY INTO PROFITS, CAPITAL, CREDIT, INTEREST, AND THE BUSINESS CYCLE 66 (Redvers Opie trans., Transaction Publishers 1983) (1934) (noting that innovation consists of new goods, new methods of production, exploitation of new markets and sources of supply, and new forms of organization).

entail incremental improvements to existing goods and methods of production, or radically new products, processes, and organizational forms.¹² However, innovation does *not* include mere changes in the quantity of production or the location of transactions to more efficiently meet consumer demand, unless some new underlying product, process, or form is involved.

A. *Innovation and Knowledge*

At its most basic level, a business firm is a collection of productive assets.¹³ Assets are inputs used to produce goods and services.¹⁴ Assets include physical goods such as inventory, buildings, and human capital, as well as intangibles such as knowledge and organizational advantages.¹⁵ Assets become productive when employed in regularized production routines.¹⁶ The combination of assets, activities, and routines within a firm gives rise to capabilities, which permit the achievement of particular outcomes through coordinating activities.¹⁷

Innovation is a capability that enables a firm to create something new, and it is heavily dependent upon the utilization of intangible knowledge assets.¹⁸ Innovation stems from learning—generating new knowledge by

12. Astrid H. Lassen et al., *The Nexus of Corporate Entrepreneurship and Radical Innovation*, 15 CREATIVITY & INNOVATION MGMT. 359, 360 (2006).

13. This view of the business firm stems from a resource-based approach to the firm. See EDITH TILTON PENROSE, *THE THEORY OF THE GROWTH OF THE FIRM* 24 (1959) (explaining that the firm is “a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision”); Kathleen M. Eisenhardt & Jeffrey A. Martin, *Dynamic Capabilities: What Are They?*, 21 STRATEGIC MGMT. J. 1105, 1105 (2000) (noting that the resource-based view of the firm “assumes that firms can be conceptualized as bundles of resources, that those resources are heterogeneously distributed across firms, and that resource differences persist over time”).

14. Steven E. Phelan & Peter Lewin, *Arriving at a Strategic Theory of the Firm*, 2 INT’L J. MGMT. REVIEWS 305, 312 (2000) (noting that under the Penrosian resource-based view of the firm, “[r]esources are defined as inputs into the firm’s operations that are used to produce products or services”).

15. Eisenhardt & Martin, *supra* note 13, at 1106-1107 (defining “resources” to include physical, human and organizational assets).

16. A routine is a “regular and predictable behavioral patterns of firms.” RICHARD R. NELSON & SIDNEY G. WINTER, *AN EVOLUTIONARY THEORY OF ECONOMIC CHANGE* 14 (1982).

17. See Phelan & Lewin, *supra* note 14, at 312 (“A capability (or competency) is the ability to perform a task or activity that involves complex patterns of co-ordination and co-operation between people and other resources” and includes “research and development, excellent customer service and high quality manufacturing.”).

18. Roger J. Calantone et al., *Learning Orientation, Firm Innovation Capability, and Firm Performance*, 31 INDUSTRIAL MARKETING MGMT. 515, 515-18 (2002) (reviewing literature on organizational learning and innovation); Benn Lawson & Danny Samson, *Developing Innovation Capability in Organisations: A Dynamic Capabilities Approach*, 5

building upon existing knowledge.¹⁹ Innovation occurs when a firm “transform[s] knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders.”²⁰ Much of the knowledge from which innovation stems is tacit and “local,” meaning that such knowledge is unique to the company and the environment in which the knowledge arises.²¹ A successful innovation capability builds upon the knowledge within the company to integrate new products or methods into the firm’s existing production and marketing capabilities. In addition, the “absorptive capacity” of a firm to integrate external knowledge is crucial for successful innovation.²² Ultimately, successfully leveraging and managing new knowledge through innovation improves firm performance to the benefit of investors and consumers.²³

INT’L J. INNOVATION MGMT. 377, 382 (2001) (noting that leading innovators “[link] organisational learning and knowledge” to production and view innovation “as a mechanism for creating new knowledge”).

19. See MARIO MORRONI, KNOWLEDGE, SCALE AND TRANSACTIONS IN THE THEORY OF THE FIRM 233 (2006) (“Innovative activity can be regarded as a learning process.”); O’SULLIVAN, *supra* note 11, at 12–14 (characterizing innovation as a cumulative learning process based upon the existing “‘common stock’ of knowledge”); Shaw et al., *supra* note 10, at 396 (“[C]reativity assists in the emergence of new and novel ideas that will initiate and support the innovation process . . . Existing knowledge is important because, in order to be creative, innovators must go beyond the established status quo . . .”); Shaker A. Zahra et al., *Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda*, 43 J. MGMT. STUD. 917, 932 (2006) (explaining that innovative “learning . . . depends on what [firms] already know”).

20. See Lawson & Samson, *supra* note 18, at 384.

21. See Jackie Krafft & Jaques-Laurent Ravix, *The Governance of Innovative Firms: An Evolutionary Perspective*, 14 ECON. INNOVATION & NEW TECH. 125, 135 (2005) (“Innovative firms develop specific production plans and are mainly endowed with local, private and tacit knowledge.”); Keith Pavitt, *Innovation Processes*, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 88 (noting that some of the knowledge learned in the innovation process is firm-specific).

22. See Wesley M. Cohen & Daniel Levinthal, *Absorptive Capacity: A New Perspective on Learning and Innovation*, 35 ADMIN. SCI. Q. 128, 128 (1990); Tunji Adegbesan & Joan E. Ricart, *What Do We Really Know About When Technological Innovation Improves Performance (and When it Does Not)?* 12–13 (IESE Bus. Sch., Univ. of Navarra, Working Paper No. 668, 2007) (“[I]nnovateness is dependent on a firm’s ability to leverage external knowledge, integrating it with its internal knowledge sources”).

23. See William C. Bogner & Pratima Bansal, *Knowledge Management as the Basis of Sustained High Performance*, 44 J. MGMT. STUD. 165, 169–72, 181–83 (2007) (discussing the importance of new knowledge creation and continued development for firm performance); see also Jaruzelski et al., *supra* note 10, at 11–12 (finding that “high-leverage” innovators obtain more value from R&D spending and outperform rivals by integrating all stages of the innovation process).

B. *Adapting to and Creating Economic Change*

A business earns profits by generating revenues in excess of costs.²⁴ As economic change takes place over time, a firm's revenues and costs also change.²⁵ To the extent that economic change leads to higher costs or lower revenues, firms must adapt their activities or suffer losses or lower profits.²⁶ For example, a higher quality product by a competitor may result in lost business and require the company to produce a better product or face lower sales. When economic change necessitates developing new products or production methods, innovation is required.²⁷ Innovation may be a response to changes from within the firm (e.g., employee demographics) or from changes external to the firm (e.g., consumer preferences, prices of inputs, the conduct of competitors, or the opening of new markets).²⁸

As the pace of economic change and competitive pressures increase, innovation becomes a necessary "cost of doing business."²⁹ The incentive

24. A basic starting point for standard microeconomics is that firms attempt to maximize profits by maximizing total revenues and minimizing total costs, requiring a firm to produce a level of output such that marginal revenue equals marginal cost. See ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 30-31 (4th ed. 2003).

25. See Mark Casson, *Entrepreneurship and the Theory of the Firm*, 58 J. ECON. BEHAV. & ORG. 327, 333 (2005) (noting that some economic changes "are demand-related and impact mainly on a firm's revenues, while others are supply-related and mainly affect a firm's costs") (emphasis in original).

26. Total profits equals total revenues minus total costs, therefore a decrease in revenues or increase in costs will lead to lower profits. See F. A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, 523 (1945) ("[E]conomic problems arise always and only in consequence of change. So long as things continue as before, or at least as they were expected to, there arise no new problems requiring a decision, no need to form a new plan."); Theodore W. Schultz, *The Value of the Ability to Deal with Disequilibria*, 13 J. ECON. LIT. 827, 827 (1975) ("No matter what part of a modern economy is being investigated, we observe that many people are consciously reallocating their resources in response to changes in economic conditions.").

27. See Lawson & Samson, *supra* note 18, at 378 (noting that innovation is "required for adapting to changing markets, technologies and modes of competition."); Shaw et al., *supra* note 10, at 394 (noting that change is among the "key precipitating environmental factors for innovation").

28. See PETER F. DRUCKER, *INNOVATION AND ENTREPRENEURSHIP: PRACTICE AND PRINCIPLES* 35 (1985) (outlining seven sources of innovation, including sources originating from within the enterprise); Donald F. Kuratko & Michael H. Morris, *Corporate Entrepreneurship: The Dynamic Strategy for 21st Century Organizations*, in *ISSUES IN ENTREPRENEURSHIP: CONTRACTS, CORPORATE CHARACTERISTICS AND COUNTRY DIFFERENCES*, 2002 21, 28-30 (Gary D. Libecap ed., 2003) (noting both external and internal drivers of entrepreneurial activity in corporations); Casson, *supra* note 25, at 332-34 (introducing a typology of sources of economic volatility).

29. See Richard N. Langlois, *Transaction-Cost Economics in Real Time*, 1 INDUS. & CORP. CHANGE 99 (1992) (noting that as "firms and markets learn" there arises a "kind of information or knowledge cost—the cost of transferring the firm's capability to the market or vice versa").

to stay ahead of competition and preserve profits will induce an established firm to innovate when the established firm's "failure to develop the innovation means that new entrants almost certainly will."³⁰ Accordingly, a firm may need to adopt innovation routines and make innovation a part of its overall strategy for dealing with change.³¹

In addition, firms can increase profits by using innovation to proactively exploit change or create change. Proactive innovation "consists in the purposeful and organized search for changes, and in the systematic analysis of the opportunities such changes might offer for economic or social innovation."³² Indeed, proactively exploiting change for profit constitutes the "overwhelming majority of successful innovations."³³ Even where there is little or no change, innovators can introduce change to the economy by creating higher quality or lower cost products or methods. This process often leads to fundamental changes in industries and the economy, and was famously characterized by economist Joseph Schumpeter as "creative destruction."³⁴ The capability of a firm to create change through innovation, like any other productive asset, is a source of value to the business and its shareholders. For this reason, successful innovation results in better economic performance,³⁵ thereby making investors better off.

30. DAVID BESANKO ET AL., *ECONOMICS OF STRATEGY* 437 (4th ed. 2007).

31. NELSON & WINTER, *supra* note 16, at 128-34; *see* Lassen et al., *supra* note 12, at 366 (explaining that the "flexibility" required for innovation entails "the ability to incorporate change as a continuous consideration in the organization" such that change "is perceived as a natural process"); James P. Andrew et al., *Innovation 2007: A BCG Management Survey* 20 (2007), available at http://www.bcg.ch/fileadmin/media/pdf/innovation_2007.pdf (noting that successful innovators "have seemingly institutionalized the ability to innovate"); *see also* Kuratko & Morris, *supra* note 28 at 25 ("[I]nnovation is the key to developing and successfully exploiting competitive advantages."); Lawson & Samson, *supra* note 18, at 381 (noting that as the result of changes in the marketplace "[i]nnovation represents today's competitive advantage").

32. DRUCKER, *supra* note 28, at 35; *see also* Lassen et al., *supra* note 12, at 361, 363-67, 368 (explaining that a fundamental aspect of innovation is being proactive through anticipating and pursuing new opportunities).

33. DRUCKER, *supra* note 28, at 35; *see also* Lawson & Samson, *supra* note 18, at 386 (discussing Cisco as an example of a company which employs strategies to use innovation proactively, as opposed to reactively; such companies are more successful).

34. JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM AND DEMOCRACY* 81-86 (3rd ed. 1975) (1942).

35. RONALD S. JONASH & TOM SOMMERLATTE, *THE INNOVATION PREMIUM: HOW NEXT GENERATION COMPANIES ARE ACHIEVING PEAK PERFORMANCE AND PROFITABILITY* 5-7 (1999); Leslie H. Vincent et al., *Does Innovation Mediate Firm Performance? A Meta-Analysis of Determinants and Consequences of Organizational Innovation* 18 (2004), available at <https://www.smartech.gatech.edu/handle/1853/10731>.

C. Long-Term Risk-Taking

Compared to other types of investment projects undertaken by corporations, innovation projects tend to be riskier and require longer-term commitments.³⁶ Innovation, by definition, involves something new and unknown and therefore requires a firm to undertake R&D or other projects with a high degree of uncertainty regarding their outcomes.³⁷ Furthermore, substantial long-term investments are so important to successful innovation that unsuccessful innovation may result simply from the failure to commit sufficient assets for a long enough period.³⁸ Successful commercialization of particular innovations can be a process lasting several years and may require sacrificing short-term profits to gain from more important sources of company value in the long-term.³⁹

Long-term innovation investments require employees to “commit their skills and efforts to the pursuit of the goals of the enterprise rather than selling their human capital on the open market.”⁴⁰ Commitment by top management, in particular, helps ensure successful radical innovation because top managers are the principle instigators of long-term, strategic decision-making.⁴¹ Financial commitment is also often a precondition to successful completion of a long-term innovation project.⁴² Financial

36. Bengt Holmstrom, *Agency Costs and Innovation*, 12 J. ECON. BEHAV. & ORG. 305, 309 (1989).

37. Mary O’Sullivan, *Finance and Innovation*, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 257-58; Pavitt, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 88 (“Innovation is inherently uncertain, given the impossibility of predicting accurately the cost and performance of a new artifact, and the reaction of users to it.”).

38. O’SULLIVAN, *supra* note 11, at 20 (“[A] failure to generate returns at any point in [the innovation process] may be a manifestation not of a failed innovative strategy, but of the need to commit even more resources to an ongoing learning process.”); Lawson & Samson, *supra* note 18, at 381 (noting that “innovation is a force of instability, often requiring long-term vision and commitment to yield results”).

39. See, e.g., BESANKO et al., *supra* note 30, at 430 (noting that “JVC-Matsushita’s success in the VCR business was shaped by decisions and commitments that those firms made 15 to 20 years before VCRs became commercially viable.”); Mike Rogoway, *Magic Inside: Intel’s Breakthrough*, OREGONIAN, July 15, 2007 (reporting that Intel began work in 2003 on a microprocessor innovation that was completed in 2007), available at http://blog.oregonlive.com/oregonianextra/2008/04/the_oregonians_pulitzer_prize.html; Andrew et al., *supra* note 31, at 22 (noting that a managerial survey respondent attributed Toyota’s success in innovation to its “willing[ness] to forgo today’s profit in order to dominate the market later on”).

40. O’SULLIVAN, *supra* note 11, at 60.

41. See Lassen et al., *supra* note 12, at 368 (arguing that top management commitment is a determining factor in entrepreneurial success); see also *infra* note 67 and accompanying text (arguing the necessity of management approval in entrepreneurial corporate exercises).

42. See O’SULLIVAN, *supra* note 11, at 60 (explaining that financial institutions must “support the ongoing access of a business organization to the financial resources required to undertake and sustain the development and utilization of productive resources until such a

commitment allows firms to capture revenues generated by innovation and continue to innovate over time.⁴³ In addition, a corporate culture that tolerates failure and rewards long-term success can promote innovation by preventing individuals from abandoning projects before they are completed.⁴⁴

D. Corporate Entrepreneurship and Strategic Decision-Making

Entrepreneurship is an essential and fundamental aspect of innovation. Accordingly, the relationship between corporate governance and corporate entrepreneurship sheds much light on the relationship between governance and innovation.⁴⁵ Entrepreneurship means to discover and utilize new economic opportunities.⁴⁶ Entrepreneurship and innovation are closely related, but not synonymous, concepts. While exploiting a new opportunity may result in the creation of new products, production methods or organizational forms (innovative entrepreneurship), it may also involve activities that do not result in innovation, such as selling existing goods in a new market (non-innovative entrepreneurship). In this sense, innovation is a subcategory of entrepreneurship.⁴⁷ Therefore, innovation by public companies occurs when corporate entrepreneurs produce new goods or implement new production methods and forms of organization.

Corporate entrepreneurship has the same general features as entrepreneurship practiced by individuals or by small, new firms.

time as these resources can generate returns”).

43. *Id.* (“Only through continued investment can the depreciation or obsolescence of existing productive resources—skills, knowledge, and physical assets—be counterbalanced by the development of new skills, knowledge, and physical resources in order to sustain the competitive advantage of the learning collectivity.”).

44. *See infra* note 54 (discussing the importance of corporate culture).

45. Modern legal scholarship has generally paid little attention to entrepreneurship theory. For a notable exception, see D. Gordon Smith & Masako Ueda, *Law and Entrepreneurship: Do Courts Matter?*, 2 ENTREPRENEURIAL BUS. L.J. 353 (2006) (arguing that common law systems revise their legal rules so as to promote capital formation and entrepreneurship by new firms).

46. *See* Scott Shane & S. Venkataraman, *The Promise of Entrepreneurship as a Field of Research*, 25 ACAD. MGMT. REV. 217, 218 (2000) (noting that entrepreneurship research involves “the study of *sources* of [economic] opportunities; the *processes* of discovery, evaluation, and exploitation of opportunities, and the set of *individuals* who discover, evaluate, and exploit them.”) (emphasis in original); *see also* Casson, *supra* note 25, at 329 (finding “judgmental decision-making” to be the defining attribute of entrepreneurship in the classic economic literature on the topic). Entrepreneurship is understood in different ways by scholars, business professionals and policymakers, and entrepreneurship research often reflects the varied approaches to entrepreneurship.

47. Lassen et al., *supra* note 12, at 360-61; *see also* Kuratko & Morris, *supra* note 28, at 25 (“[E]ntrepreneurship captures the full set of [opportunity pursuing] actions the firm takes to create, renew, or innovate . . .”).

However, it also has unique aspects due to the special structure and legal treatment of corporations under U.S. law. There are two unique aspects of corporate entrepreneurship relevant to corporate governance: the role of the board of directors in facilitating organizational change and the role of upper-level managers as entrepreneurial strategists. It should be noted that although entrepreneurship is often regarded by policymakers and the public as solely the domain of new business ventures (start-ups), large, well-established firms such as corporations also practice entrepreneurship.⁴⁸ Indeed, because of their superior access to resources, managerial skill, and distribution networks, established corporations are often more effective than small start-ups in exploiting new opportunities.⁴⁹

Entrepreneurial corporations are those that discover, create, and exploit economic opportunities.⁵⁰ Corporate entrepreneurship requires decision makers to exercise judgment over how corporate resources should be used in the face of uncertainty and how incentives should be structured to make managers and other employees more likely to discover and act upon entrepreneurial opportunities.⁵¹ Corporate entrepreneurship often leads to innovation⁵² and requires the corporate entrepreneur to “assess new opportunities” and “align and exploit resources” to further innovation.⁵³ Innovation and corporate entrepreneurship are encouraged by a corporate culture where top management supports innovative activities; does not micromanage investment projects; makes resources available to manager-entrepreneurs; and tolerates, encourages, and rewards risk-taking and failure.⁵⁴

48. See, e.g., DRUCKER, *supra* note 28, at 21-22 (noting that entrepreneurship requires a firm to be more than just new and small, and identifying specific examples of large entrepreneurial firms); Shane & Venkataraman, *supra* note 46, at 219 (“[E]ntrepreneurship does not require, but can include, the creation of new organizations . . .”).

49. DRUCKER, *supra* note 28, at 144; see also Peter F. Drucker, *Foreword* to VIJAY SATHE, CORPORATE ENTREPRENEURSHIP: TOP MANAGERS AND NEW BUSINESS CREATION xi (“The great majority of new businesses during the last decades of the twentieth century . . . were created and built by existing enterprises, and in large part by big or at least fair-sized ones . . .”).

50. See Shane & Venkataraman, *supra* note 46, at 218.

51. See Nicolai J. Foss & Peter G. Klein, *Entrepreneurship and the Economic Theory of the Firm: Any Gains from Trade?*, in HANDBOOK OF ENTREPRENEURSHIP RESEARCH 55, 63 (2005) (explaining the exercise of entrepreneurial judgment in a firm setting).

52. See Kuratko & Morris, *supra* note 28, at 26 (“Corporate entrepreneurship represents a framework for the facilitation of ongoing change and innovation in established organizations.”).

53. Shaw et al., *supra* note 10, at 394.

54. See SATHE, *supra* note 49, at 20-24 (showing that corporate entrepreneurship is promoted when resources are sufficiently available, managers do not perceive a personal risk in doing so and are not micromanaged); Jeffrey S. Hornsby et al., *Middle Managers' Perception of the Internal Environment for Corporate Entrepreneurship: Assessing a Measurement Scale*, 17 J. BUS. VENTURING 253, 256, 266-69 (2002) (arguing that corporate

The board of directors is the modern corporation's principal governance mechanism, enabling numerous interests and dispersed information to be coordinated and processed among corporate actors.⁵⁵ The three primary functions of a board are to monitor and hold top management accountable, to be indirectly involved in operational decision making (such as providing advice to top managers and setting broad corporate policies), and to provide a network of contacts to the corporation.⁵⁶ Directors delegate their decision making authority and control to top managers who, in turn, delegate their own decision making to subordinate managers and employees.⁵⁷ Just as all persons "can only gather so much information from so many inputs before being overloaded,"⁵⁸ corporate entrepreneurs, in particular, have limited attention spans they are able to devote to innovation as opposed to maintaining existing production routines.⁵⁹ Delegated decision making facilitates innovation by helping to ensure that corporate entrepreneurs can devote sufficient time to innovation projects and not be distracted by other concerns.⁶⁰

Strategic decision making is an important activity that furthers innovation. Strategic decision making means adopting "commitments, decisions, and actions designed and executed to produce a competitive advantage and earn above-average returns" on investment.⁶¹ Whereas strategic management focuses on more mundane goals such as monitoring production routines for efficiency, strategic entrepreneurship focuses on

entrepreneurship in pursuit of innovation is promoted by top management support of innovative activities, managerial autonomy, reward/incentive systems, availability of resources and a clear understanding of job duties); Lassen et al., *supra* note 12, at 361, 363-67, 368-69 (stating that flexibility and openness to change facilitate proactiveness and risk-taking which further the development of substantial innovations); Lawson & Samson, *supra* note 18, at 389-90 (noting that tolerance of ambiguity, empowered employees, time for creativity and communication are elements of a corporate culture supporting innovation); Andrew et al., *supra* note 31, at 10-11 (finding that top-level executives consider a risk-averse corporate culture to be the most significant obstacle to innovation).

55. Stephen M. Bainbridge, *Director Primacy: The Means and Ends of Corporate Governance*, 97 NW. U. L. REV. 547, 557-60, 573-74, 599-600 (2003).

56. *See id.* at 599; Lynne L. Dallas, *The Multiple Roles of Corporate Boards of Directors*, 40 SAN DIEGO L. REV. 781, 801-07 (2003).

57. Stephen M. Bainbridge, *Why A Board? Group Decisionmaking in Corporate Governance*, 55 VAND. L. REV. 1, 4-5 (2002).

58. *Id.* at 6.

59. Sharon Gifford, *The Economics of Limited Entrepreneurial Attention*, in 11 THE SOURCES OF ENTREPRENEURIAL ACTIVITY 123, 125-26 (Gary D. Libecap ed., 1999).

60. *See* Bainbridge, *supra* note 57, at 6 n.19 (noting that delegated decision making through "branching hierarchies" efficiently limits the information to which corporate supervisors are exposed).

61. Michael A. Hitt et al., *Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth Creation*, 22 STRATEGIC MGMT. J. 479, 480 (2001).

discovering and utilizing new opportunities.⁶² The strategy of an innovative corporation is to determine how to invest and develop assets to produce new products and methods to outcompete rivals.⁶³ To achieve innovation, strategic decisions should also foster long-term commitments or else “interest and attention become too dispersed.”⁶⁴ Strategic innovation requires a company to fundamentally re-conceptualize its existing business routines “to achieve dramatic value improvements for customers and high growth” for itself.⁶⁵ For example, in the mid 1990s General Motors went beyond selling automobiles to also sell information services through a hands-free on-board communications system called OnStar.⁶⁶

Top managers are the decision makers primarily responsible for strategic decision making and entrepreneurship.⁶⁷ However, the board of directors also can play a role in strategy through strategic renewal, strategic monitoring and, in certain cases, direct involvement in strategic management. Strategic renewal is a process of internal change and reorganization that results in organizational innovation.⁶⁸ Organizational innovation is important for established companies because, relative to small or new firms, established firms have well-developed production routines. Innovative public corporations need to be sufficiently flexible to change routines because often “[t]he ability of an organization to innovate is a

62. *Id.* at 480-81; see Kuratko & Morris, *supra* note 28, at 26-28 (noting that corporate entrepreneurship may be a component of a firm’s strategic decisions with respect to rivals); Steven Michael et al., *Discovery and Coordination in Strategic Management and Entrepreneurship*, in STRATEGIC ENTREPRENEURSHIP: CREATING A NEW MINDSET 44 (Michael A. Hitt et al. eds., 2002) (noting that entrepreneurial management “focuses on identifying opportunity and mobilizing resources to take the firm in new directions with new capabilities, products, or markets”); R. Duane Ireland et al., *A Model of Strategic Entrepreneurship: The Construct and its Dimensions*, 29 J. MGMT. 963, 983 (2003) (noting that strategic entrepreneurship involves opportunity- and advantage-seeking behavior).

63. See Lazonick, *supra* note 9, at 3-4, 10 (discussing the importance of innovation).

64. Lawson & Samson, *supra* note 18, at 389.

65. Bodo B. Schlegelmilch et al., *Strategic Innovation: The Construct, its Drivers and its Strategic Outcomes*, 11 J. STRATEGIC MARKETING 117, 118 (2007).

66. VIJAY GOVINDARAJAN & CHRIS TRIMBLE, TEN RULES FOR STRATEGIC INNOVATORS: FROM IDEA TO EXECUTION xviii (2005).

67. Donald F. Kuratko et al., *Corporate Entrepreneurship Behavior Among Managers: A Review of Theory, Research, and Practice*, in CORPORATE ENTREPRENEURSHIP 7, 10 (Jerome A. Katz & Dean A. Sheperd eds., 2004); Zahra et al., *supra* note 19, at 944.

68. See Donald F. Kuratko et al., *A Model Of Middle Level Managers’ Entrepreneurial Behavior*, 29 ENTREPRENEURSHIP THEORY & PRAC. 699, 701 (2005) (analyzing the transformation of ongoing organizations through strategic renewal); Shaker A. Zahra, *Governance, Ownership, and Corporate Entrepreneurship: The Moderating Impact of Industry Technological Opportunities*, 39 ACAD. MGMT. J. 1713, 1715 (1996) (noting that corporate entrepreneurship includes strategic renewal activities such as “revitalizing the company’s operations by changing the scope of its business” and “building or acquiring new capabilities and then creatively leveraging them to add value for shareholders”).

precondition for the successful utilization of inventive resources or new technologies.”⁶⁹ For example, in the late 1980’s, Samsung became a leading innovator in computer memory chips, but would not have been able to do so without first decentralizing its operations and consolidating certain business units.⁷⁰

A board is more likely to play a significant role in strategic renewal when a company is undertaking substantial structural changes and is operating in a relatively uncertain economic environment.⁷¹ Boards also often engage in strategic monitoring, which includes evaluating management’s strategic choices *after* they are made and making broad recommendations regarding strategy.⁷² Boards rarely exercise a direct role in strategic management. This is likely because outside directors acting in a direct strategic capacity may harm performance with contributions that are redundant, based on knowledge inferior to that of managers, or in interference with the board’s and management’s other functions.⁷³

E. Innovation and the Established Corporation

Established corporations possess inherent advantages and disadvantages over other types of organizations in creating and utilizing innovations. Established firms’ advantages include possession of complementary production and marketing resources, access to internal capital, routines for innovation, and economies of scope and scale.⁷⁴ On the other hand, corporate innovation is “path dependent,” meaning that its course is constrained by prior commitments and established routines.⁷⁵ Established firms that have already invested in a particular product or organizational capability may be reluctant to switch to a new technology

69. See Alice Lam, *Organizational Innovation*, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 115.

70. BESANKO ET AL., *supra* note 30, at 531.

71. Kevin Hendry & Geoffrey C. Kiel, *The Role of the Board in Firm Strategy: Integrating Agency and Organisational Control Perspectives*, 12 CORP. GOVERNANCE 500, 510 (2004) (noting that the strategic role of the board “help[s] an organization adapt to environmental change” and that environmental uncertainty likely leads to directors asserting more strategic control).

72. Dallas, *supra* note 56, at 807-08.

73. See *id.* The relationship between outside directors and innovation is explored in detail in *infra* Part III.C.

74. See Scott Shane & Riitta Katila, *When Are New Firms More Innovative Than Established Firms?* 3 (2003) (unpublished article, on file with the Robert H. Smith School of Business) (reviewing the economics literature identifying reasons why established firms may be more innovation than new firms).

75. BESANKO ET AL., *supra* note 30, at 443-45; see also Zahra et al., *supra* note 19, at 932 (“[L]earning is a path dependent process wherein what firms learn depends on what they already know.”).

for fear of taking away profits from their current products and lowering the value of resources used to make those products.⁷⁶ For example, from 2005 to 2006, Motorola allocated too many resources to maintaining its popular RAZR cell phone and not enough to developing the next generation of phones to stay ahead of competitors.⁷⁷ Larger firms may also suffer from organizational inertia and have trouble adapting to change.⁷⁸ In particular, large established firms often have trouble integrating new products with established routines and structures.⁷⁹ In a 2007 survey of approximately 2,500 top-level managers around the world, failing to implement an innovation project quickly enough was identified as one of the most significant barriers to successful innovation.⁸⁰ Effective innovation thus requires strategic renewal and other forms of adaptation and flexibility in order to properly and timely incorporate new processes and products.⁸¹

When an established corporation undertakes innovation successfully, it is generally an organization-wide effort. While certain aspects of the process, such as R&D or product development, may be segregated into discrete units and operated by actors not involved in other aspects of the company's operations,⁸² corporate assets involved in the innovation process encompass numerous aspects of a company's operations and

76. BESANKO ET AL., *supra* note 30, at 436.

77. Christopher Rhoads & Li Yuan, *How Motorola Fell a Giant Step Behind—As it Milked Thin Phone, Rivals Sneaked Ahead on the Next Generation*, WALL ST. J., April 27, 2007, at A1.

78. Michael T. Hannan & John Freeman, *Structural Inertia and Organizational Change*, 49 AM. SOC. REV. 149, 149 (1984); *see also* Holmstrom, *supra* note 36, at 306 (finding that “the large corporation has emerged primarily to serve production and marketing goals and that in pursuing those objectives effectively it has to organize in a way that compromises innovation incentives”); Jesper B. Sorensen & Toby E. Stuart, *Aging, Obsolescence, and Organizational Innovation*, 45 ADMIN. SCI. Q. 81 (2000) (describing the effects of “aging” on innovation).

79. *See* Deborah Dougherty & Trudy Heller, *The Illegitimacy of Successful Product Innovation in Established Firms*, 5 ORG. SCI. 200, 214 (1994) (finding that a common barrier to innovation exists where “the constituent activities of new product development do not fit into, or are not a part of, the legitimate system of thought and action in multiple, if subtle, ways”) (emphasis in original); Wim Vanhaverbeke & Nico Peeters, *Embracing Innovation as Strategy: Corporate Venturing, Competence Building and Corporate Strategy Making*, 14 CREATIVITY & INNOVATION MGMT. 246, 247 (2005) (explaining that large firms must develop new capabilities to capitalize on new products or technologies).

80. Andrew et al., *supra* note 31, at 10-11, 17-19.

81. Nils Stieglitz & Klaus Heine, *Innovations and the Role of Complementarities in a Strategic Theory of the Firm*, 28 STRATEGIC MGMT. J. 1, 5 (2007); David J. Teece et al., *Dynamic Capabilities and Strategic Management*, 18 STRATEGIC MGMT. J. 509, 515 (1997).

82. *See* Phillippe Aghion & Jean Tirole, *The Management of Innovation*, 109 Q. J. ECON. 1185, 1206 (1994) (“[W]hen intellectual inputs dominate as for software and biotechnology, research will often be performed by independent units”); *see also* DRUCKER, *supra* note 28, at 174 (stating that innovative firms should not “put the entrepreneurial into the existing managerial component [Nor] make innovation an objective for people charged with running, exploiting, optimizing what already exists”).

governance structure. In the context of an established corporation, innovation is

a set of interwoven processes . . . [that] are multiple, overlapping and performed by a multitude of different actors inside and outside companies, with a distribution of actions and decision making at different organizational levels . . . related both to higher-level structural organizational arrangements, and to lower-level microbehavioural attainments.⁸³

Accordingly, the activities of the researchers, directors, managers, and advertisers required to successfully complete an innovation project are interdependent.⁸⁴ Learning and communicating the new knowledge needed for innovation requires coordinating the activities within a company.⁸⁵ For example, when BMW begins to develop a new model automobile, employees from departments as diverse as engineering, design, marketing, purchasing, and finance are brought together to a centralized location to facilitate coordination of their activities.⁸⁶

II. INNOVATION AND CORPORATE GOVERNANCE

Because innovation requires coordination of activities on a company-wide basis, it is affected by corporate governance structures and policies applicable to the entire organization.⁸⁷ Based upon the defining

83. Munari & Sobrero, *supra* note 10, at 3-4; *see also* Deborah Dougherty & Cynthia Hardy, *Sustained Product Innovation in Large, Mature Organizations: Overcoming Innovation-to-Organization Problems*, 39 ACAD. MGMT. J. 1120, 1123 (1996) (“Each innovation project also needs administrative structures and processes appropriate to its development stage and access to decision making across the organization.”).

84. *See* Jan Fagerberg, *Innovation: A Guide to the Literature*, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 13 (describing innovation as a systemic process comprised of “a set of activities (or actors) that are interlinked”); Keith Pavitt, *Innovation Processes*, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 88 (describing innovation within large corporations as a series of several overlapping processes); Stieglitz & Heine, *supra* note 81, at 5 (explaining that “individual learning processes [involved with innovation] are themselves interdependent and require coordination”).

85. *See* O’SULLIVAN, *supra* note 11, at 14-17 (observing that working with other people creates new opportunities to learn outside an individual’s personal work and experience); Shaw et al., *supra* note 10, at 400 (observing that social interaction is necessary for the effective exchange of resources and information).

86. *Special Report: The World’s Most Innovative Companies*, BUSINESSWEEK, April 24, 2006, available at http://www.businessweek.com/magazine/content/06_17/b3981401.htm.

87. *See* Langlois, *supra* note 29, at 106 (1992) (“How the firm is organized—how the routines of the humans and machines are linked together—is also part of a firm’s capabilities. Indeed, ‘skills, organization, and “technology” are intimately intertwined in a functioning routine, and it is difficult to say exactly where one aspect ends and another begins.’”).

characteristics of innovation and how innovation is practiced by corporations, this Part identifies the types of governance structures that support innovation. Generally, structures that support innovation are designed to prevent managers from acting myopically to achieve short-term outcomes with relatively low risk. However, innovation-facilitating governance structures may also allow managers to act opportunistically and benefit themselves at the expense of investors. To maximize shareholder value while facilitating innovation, a company must choose the right balance between employing outside monitors to reduce opportunism and utilizing proximate monitors to reduce myopia.

A. Governance Structures and Shareholder Value

Corporate governance consists of the rules, entities, and processes that govern how corporations use their assets to generate and distribute revenues among shareholders, employees, and other parties.⁸⁸ A primary type of governance structure comes from corporate law, which consists of: “Off-the-rack” state statutes giving rise to the unique corporate form; employment and compensation contracts, corporate charters, and by-laws; regulations, such as those mandating disclosure to publicly raise capital; and the holdings of court decisions defining the meaning of such rules and establishing fiduciary and other duties among the relevant parties.⁸⁹ Monitoring and disciplining entities is also a type of governance structure, both internal to the corporation (such as the board of directors) and external to it (such as federal regulators, auditors, and securities analysts). A third type of structure arises from competitive processes such as the market for corporate control, which constrains and alters the behavior of directors and managers through mechanisms such as hostile takeovers and proxy contests. The ultimate goal of any system of corporate governance is to maximize the wealth of stockholders.⁹⁰

88. See O’SULLIVAN, *supra* note 11, at 1 (“[A] system of corporate governance shapes who makes investment decisions in corporations, what types of investments they make, and how returns from investments are distributed.”).

89. See, e.g., Gillian Hadfield & Eric Talley, *On Public Versus Private Provision of Corporate Law*, 22 J.L. ECON. & ORG. 414, 416-17 (2006) (describing the types of services that constitute “corporate law”); Roberta Romano, *Corporate Law and Corporate Governance*, 5 INDUS. & CORP. CHANGE 277, 277-78 (1996) (explaining that corporate governance institutions are “established or policed by corporate law [A]s the legal regime sets the parameters for all corporate governance mechanisms”).

90. Bainbridge, *supra* note 55, at 574-84; see also Katz v. Oak Indus. Inc., 508 A.2d 873, 879 (Del. Ch. 1986) (“It is the obligation of directors to attempt, within the law, to maximize the long-run interests of the corporation’s stockholders.”); Henry Hansmann & Reinier Kraakman, *The End of History for Corporate Law*, 89 GEO. L.J. 439, 441 (2001) (describing the scholarly consensus that “the best means to this end (that is, the pursuit of aggregate social welfare) is to make corporate managers strongly accountable to shareholder

In the United States, significant aspects of corporate law are “enabling” as opposed to mandatory, meaning that corporations may choose their own governance structures from a default set of rules provided by state incorporation statutes.⁹¹ In practice, corporations avail themselves of this ability by adopting a variety of different governance mechanisms. Transaction cost economics provides a basic rationale for the diversity in governance structures—those structures aligned with transaction-specific characteristics have *performance advantages* over less well-aligned structures.⁹² Transaction cost economics identifies the important characteristics of transactions, how those characteristics give rise to particular types of transaction costs, and then identifies what governance structure reduces the costs of undertaking transactions and increases productive output.⁹³

The alignment of governance structures with transactions based upon their specific characteristics also holds at the firm level. The empirical corporate governance literature largely finds that a corporation’s choice of governance structure is a result of its firm-specific characteristics. In other words, governance mechanisms are endogenously determined by firm attributes.⁹⁴ Furthermore, companies generally choose structures that

interests and, at least in direct terms, only to those interests”); Jean Tirole, *Corporate Governance*, 69 *ECONOMETRICA* 1, 1 (2001) (“The standard definition of corporate governance among economists and legal scholars refers to the defense of shareholders’ interests.”); Sanjai Bhagat & Roberta Romano, *Empirical Studies of Corporate Law* 3 (Eur. Corp. Gov. Inst., Working Paper No. 44/2005, 2005) (“[T]he benchmark for evaluating the benefit of corporate and securities laws is whether they improve investor welfare.”).

91. FRANK H. EASTERBROOK & DANIEL R. FISCHEL, *THE ECONOMIC STRUCTURE OF CORPORATE LAW* 2-3 (Harvard University Press 1996) (1991) (observing that in almost every state the corporate code acts as an enabling statute).

92. See Robert J. David & Shin-Kap Han, *A Systematic Assessment of the Empirical Support for Transaction Cost Economics*, 25 *STRATEGIC MGMT. J.* 39, 40 (2004) (noting that the central claim of transaction cost economics is “that transactions will be handled in such a way as to minimize the costs involved in carrying them out”); Oliver E. Williamson, *Strategizing, Economizing, and Economic Organization*, 12 *STRATEGIC MGMT. J.* 75, 79 (1991) (identifying the main task of the transaction cost theory of the firm as “align[ing] transactions, which differ in their attributes, with governance structures, which differ in their costs and competencies, in a discriminating (mainly, transaction cost economizing) way”).

93. David & Han, *supra* note 92, at 40-41.

94. See Chidambaran et al., *supra* note 2, at 28-29 (concluding from the impact of changes in governance structures on firm value that “firms are endogenously optimizing their governance structure in response to observable and unobservable firm characteristics”); James S. Linck et al., *The Determinants of Board Structure*, 87 *J. FIN. ECON.* 308, 309 (2008) (finding that “firms structure their boards in ways consistent with the costs and benefits of monitoring and advising by the board,” which varies across different types of firms); M. Babajide Wintoki et al., *Endogeneity and the Dynamics of Corporate Governance* 4-6 (Oct. 11, 2007) (unpublished research paper, on file with University of Georgia, Terry College of Business), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=970986 (finding no significant relationship between board composition, board size, board leadership, insider ownership and firm performance). *But*

maximize overall firm value, as opposed to choosing structures that benefit managers or some other corporate constituency.⁹⁵ Accordingly, there is no set of “good” governance structures that can be universally adopted to make investors in firms with different characteristics better off.⁹⁶ Because innovative firms often share similar characteristics, they adopt similar governance mechanisms to facilitate innovation.

B. Governance Structures Supporting Innovation

Because a firm’s choice of governance devices is in large part a response to transaction- or firm-specific characteristics, the economic characteristics of innovation and of innovative firms provide insight as to what structures facilitate (or undermine) innovation. Furthermore, because corporations generally choose governance structures in order to maximize performance (and hence, value to shareholders), the governance devices adopted by firms that successfully innovate provide insight into how innovation should be governed. Based upon the characteristics of innovation identified in Part I, as well as a large body of literature analyzing the characteristics of successful innovative firms, two fundamental structures that facilitate innovation can be identified: (1) decentralization which facilitates the generation and communication of knowledge, and affords companies the flexibility required to adapt to change; and (2) an emphasis on strategic internal control which promotes long-term risk-taking.

see Reena Aggarwal & Rohan Williamson, Did New Regulations Target the Relevant Corporate Governance Attributes?, 24, 28-29 (April 14, 2006) (unpublished research paper, on file with Georgetown University, McDonough School of Business), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=891411 (finding that governance structures and firm value are not endogenously determined).

95. *See* Audra L. Boone et al., *The Determinants of Corporate Board Size and Composition: An Empirical Analysis*, 85 J. FIN. ECON. 66, 69 (2007) (finding results which “indicate that board size and composition vary across firms and change over time to accommodate the specific growth, monitoring, and managerial characteristics of the firm”); Chidambaran et al., *supra* note 2, at 34-36; Linck et al., *supra* note 94, at 309 (finding the results of testing what firm-specific attributes are correlated with what board structures to be “generally consistent with efficiency explanations of the determinants of board structure”); Wintoki, *supra* note 94, at 4-6 (finding no significant relationship between board composition, board size, board leadership, insider ownership and firm performance).

96. *See* J. Harold Mulherin, *Corporations, Collective Action and Corporate Governance: One Size Does Not Fit All*, 124 PUB. CHOICE 179, 199 (2005) (“The central policy implication of the prior research and new supporting evidence is that one size does not fit all in corporate governance”); Chidambaran et al., *supra* note 2, at 5-6 (finding that good and bad changes in governance structures lead to both positive and negative performance changes, no differences in performance between firms that have good or bad changes, and that corporations with good governance do not outperform those with worse governance).

As a matter of first principle, because innovation is dependent upon the proper utilization of tacit and particularized knowledge,⁹⁷ innovation requires corporate activities to be organized so that knowledge is generated and communicated to the appropriate decision makers.⁹⁸ Companies should thus be structured to decrease the costs of generating knowledge and communicating it within the firm.⁹⁹ Furthermore, governance devices should also create opportunities and incentives to learn, communicate, and allocate decision making to those directors or managers with the knowledge most relevant for a given task.¹⁰⁰ When economic activity depends upon the generation and communication of tacit or firm-specific knowledge, outside monitoring and centralized decision-making are generally of limited value. This is because tacit and particularized knowledge is costly to communicate, especially to those lacking familiarity with the context in which the knowledge arose.¹⁰¹

Accordingly, knowledge-generation and communication tend to benefit from the adoption of decentralized governance structures, or those

97. See *supra* Part I.A.

98. See O'SULLIVAN, *supra* note 11, at 20-21, 22-23, 36-37 (explaining the importance of organization to utilizing the knowledge involved with innovation); Érica Gorga & Michael Halberstam, *Knowledge Inputs, Legal Institutions and Firm Structure: Towards a Knowledge-Based Theory of the Firm*, 101 NW. U. L. REV. 1123, 1127 (2007) (noting that two functions served by economic organization are the production of knowledge and communication or "diffusion" of that knowledge).

99. See Nicolai J. Foss, *The Emerging Knowledge Governance Approach: Challenges and Characteristics*, 14 ORG. 29, 45 (2007) ("As a practical and normative enterprise, knowledge governance means deploying governance mechanismses [sic] that mitigate the costs of sharing, integrating and creating knowledge . . .").

100. See Nicola Lacetera, *Corporate Governance and the Governance of Innovation: The Case of Pharmaceutical Industry*, 5 J. MGMT. & GOVERNANCE 29, 38 (2001) (explaining that to support innovation "decision-makers should have appropriate information about [a] firm's operations" and incentives should be in place so persons share knowledge and competencies).

101. See NELSON & WINTER, *supra* note 16, at 125 (noting the "severe limits on articulation [in the case] of organizational knowledge"); Walter W. Powell & Stine Grodal, *Networks of Innovators*, in THE OXFORD HANDBOOK OF INNOVATION, *supra* note 8, at 76 (noting that the type of knowledge typically leading to innovation is "very 'sticky' and contains a large tacit component [such that] the degree of difficulty and the costs of transfer are high"); Foss, *supra* note 99, at 46 (noting that because of the tacit nature of much knowledge, "delegation of the right to initiate, carry out, etc. knowledge sharing with colleagues seems to be an efficient alternative to instructing employees to share specific knowledge" through a centralized decision-making mechanism); see also Milton Harris & Artur Raviv, *A Theory of Board Control and Size*, REV. FIN. STUD. 33-35 (forthcoming 2008) (showing that insider control of boards is optimal when knowledge possessed by insiders is beyond a threshold level of importance beyond knowledge possessed by outsiders); Charu G. Raheja, *Determinants of Board Size and Composition: A Theory of Corporate Boards*, 40 J. FIN. & QUANT. ANALYSIS 283, 285 (2005) (showing that the optimal number of outsiders on the board decreases as monitoring or "verification" costs increase).

structures giving corporate agents, such as managers and their subordinates, more discretion.¹⁰² An essential component of decentralization in the corporate context consists of allocating decision making authority to insiders who have superior knowledge about the company and its environment.¹⁰³ Innovation is thus furthered when “the allocation of corporate resources and returns is in the hands of decision-makers who are integrated with the learning process that generates innovation.”¹⁰⁴ For example, innovative companies seem to benefit from having a relatively high proportion of board members that are also company insiders (i.e., employees).¹⁰⁵

Decentralized governance facilitates not only knowledge-utilization, but also the type of organizational flexibility that innovation requires.¹⁰⁶ In adapting to ongoing economic change, a “manager must be endowed with sufficient elements of discretion in order to organize the coordination of innovative investments.”¹⁰⁷ In particular, changing and adapting organizational structures requires that managers have “control and decision rights over the firm’s assets, including the rights to redefine and reallocate specific use and decision rights.”¹⁰⁸ In other words, substantial managerial discretion facilitates strategic renewal and organizational innovation.¹⁰⁹ In

102. See Nicolai J. Foss & Keld Laursen, *Performance Pay, Delegation and Multitasking Under Uncertainty and Innovativeness: An Empirical Investigation*, 58 J. ECON. BEHAV. & ORG. 246, 264-65 (2005) (finding that employees often have greater authority delegated to them and are less restricted in their activities in dynamic and innovative environments); Robert M. Grant, *Toward A Knowledge-Based Theory of the Firm*, 17 STRATEGIC MGMT. J. 109, 119 (1996) (“The principle of co-location requires that decisions based upon such tacit and idiosyncratic knowledge are decentralized, while decisions requiring statistical knowledge are centralized.”); Jack A. Nickerson & Todd R. Zenger, *A Knowledge-Based Theory of the Firm—The Problem-Solving Perspective*, 15 ORG. SCI. 617, 626 (2004) (arguing that decentralized consensus-based hierarchy “achieves extensive knowledge transfer by enhancing the efficiency with which knowledge transfer occurs among actors within the firm”); Joseph E. Stiglitz, *Public Policy for a Knowledge Economy* 3, 19 (Jan. 27, 1999) (unpublished article, on file with World Bank) (“In the firm, moving from simple repetitive work under central control (Taylorism) to more complex knowledge-based work requires a move towards a more decentralized and participative workplace.”).

103. See MICHAEL C. JENSEN & WILLIAM H. MECKLING, *FOUNDATIONS OF ORGANIZATIONAL STRATEGY* 106 (1998) (“When knowledge is valuable in decision making, there are benefits to colocating decision authority with the knowledge that is valuable to those decisions.”).

104. O’SULLIVAN, *supra* note 11, at 60.

105. See *infra* Part III.C.

106. Teece et al., *supra* note 81, at 515.

107. Krafft & Ravix, *supra* note 21, at 140.

108. Stieglitz & Heine, *supra* note 81, at 7.

109. See *id.* at 7-8 (noting that “[i]f general management is not permitted to change organizational structures and experiment with new ways of doing things, the development of new corporate assets may be seriously hampered”); Zahra et al., *supra* note 19, at 941, 950 (arguing that established firms change their existing capabilities through planned change which in turn enables strategic renewal).

addition, managerial discretion facilitates integration of new products and processes with established routines, especially when major innovations require a company to make a significant change in organizational structure or change how production processes are carried out.¹¹⁰ In sum, decentralization helps companies to utilize knowledge, adapt to and promote economic change, engage in strategic renewal, and integrate new products into existing routines.

In addition to facilitating the utilization of knowledge to promote innovation, governance must encourage commitment to long-term risk-taking. The most straightforward governance devices facilitating long-term innovation activities are compensation contracts giving managers monetary incentives to take long-term risks.¹¹¹ Incentive compensation in the form of stock, stock options, or bonuses tied to longer-term measures of performance can successfully promote long-term risk-taking.¹¹² However, compensation schemes with the goal of promoting innovation are inherently limited. Because innovation is a long-term and organization-wide process often involving numerous persons, it is difficult to measure an individual's precise contribution to innovation and hence compensate them appropriately.¹¹³ Furthermore, compensation schemes use financial indicators of success and therefore may lead managers to focus on more

110. See Stieglitz & Heine, *supra* note 81, at 6 (arguing that formal organizational structures are less important for integrating more substantial "modular" and "radical" innovations, and that management needs substantial control to change organizational structures); Teece et al., *supra* note 81, at 521 (noting that decentralization and local autonomy assist the processes of "reconfiguration and transformation"); see also Dougherty & Hardy, *supra* note 83, at 1121-22 (noting that successful innovation requires connecting innovations with existing routine operations).

111. See O'SULLIVAN, *supra* note 11, at 60 ("[T]he prospects of sharing in the gains of successful innovation by the investing organization can lead even mobile participants to forgo the lure of the market and remain committed to the pursuit of organizational goals."); Lawson & Samson, *supra* note 18, at 382 ("Leading innovators encourage, expect and reward innovation from everywhere within the organisation . . ."); Stieglitz & Heine, *supra* note 81, at 6-7 (finding that incentive to invest in innovative assets is greater when the decision-maker owns the assets); see also Andrew Tylecote & Paulina Ramirez, *Corporate Governance and Innovation: The U.K. Compared with the U.S. and "Insider" Economies*, 35 RES. POL'Y 160, 162 (2006) (arguing that innovation is facilitated when corporate governance enables the firm to appropriate returns).

112. See Vincent L. Barker III & George C. Mueller, *CEO Characteristics and Firm R&D Spending*, 48 MGMT. SCI. 782, 793 (2002) (finding that "greater stock ownership by the CEO was associated with higher R&D spending"); Jeffrey L. Coles et al., *Managerial Incentives & Risk-Taking*, 79 J. FIN. ECON. 431, 464 (2006) (finding that "higher sensitivity to stock price volatility in the managerial compensation scheme gives executives the incentive to . . . invest in riskier assets" such as more investment in R&D).

113. See Jennifer Francis & Abbie Smith, *Agency Costs and Innovation: Some Empirical Evidence*, 19 J. ACCT. & ECON. 383, 385 (1995) (noting that the difficulty in measuring innovation "hinders the design of incentive contracts which are effective at spurring inventive activity").

predictable and easily measured short-term activities.¹¹⁴

As an alternative to compensation devices to promote innovation, a corporation may de-emphasize short-term or financial measures of success. Management scholars distinguish between strategic and financial internal control systems. The first type of control “emphasize[s] largely subjective and sometimes intuitive criteria for evaluation.”¹¹⁵ Financial controls, by contrast, employ objective evaluation criteria such as return on investment.¹¹⁶ While both types of controls facilitate innovation, a significant emphasis on strategic control is required for sustained innovation because strategic controls focus on and evaluate long-term performance, establish risk-taking norms, and reward activities resulting in innovation.¹¹⁷ As explained by Munari and Sobrero, “if managers know that they will be evaluated on neither short-term commitments nor immediately measurable achievements, they could have higher incentives to leverage their tacit knowledge of internal entrepreneurial resources and support longer-term development plans.”¹¹⁸

By contrast, a relatively high emphasis on financial control undermines innovation because, within the context of quarterly and annual disclosure requirements mandated by federal securities laws, periodically reported financial data are necessarily tied to short-term outcomes. Over-emphasizing financial control may inhibit the communication of tacit and local knowledge that is not subject to straightforward measurement and quantification in financial reports.¹¹⁹ Of course, companies do and may even need to improve their internal measures of innovation.¹²⁰ However, innovation may be undermined if companies increase their measurement of innovation as part of a general shift toward emphasizing short-term

114. See, e.g., Munari & Sobrero, *supra* note 10, at 11 (observing that financial indicators offer objectivity but are short term in nature, causing managers to move towards low risk strategies effecting long-term growth and returns); Gustavo Manso, *Motivating Innovation I* (Jan. 2, 2006) (unpublished research paper, on file with Northwestern University Kellogg School of Management), available at <http://www.kellogg.northwestern.edu/finance/faculty/seminars/manso011306.pdf> (noting that pay-for-performance compensation “encourages the repetition of what has worked in the past, but not the exploration of new untested approaches”).

115. Michael A. Hitt et al., *The Market for Corporate Control and Firm Innovation*, 39 *ACAD. MGMT. J.* 1084, 1090 (1996).

116. *Id.*

117. *Id.* at 1095.

118. Munari & Sobrero, *supra* note 10, at 10.

119. *Id.* at 11; see also Judith L. Estrin, President and CEO, Packet Design LLC, Remarks at Managing Innovation Wall Street Journal Panel (Sept. 24, 2007), available at <http://video.aol.com/video-detail/risk-and-innovation/369664101> (noting that “all of the [formal processes] that companies have [implemented] for quality and efficiency are essentially enemies of innovation” and that successful innovation requires “being able to make judgment calls without a lot of data”).

120. See generally Andrew et al., *supra* note 31.

financial outcomes to the detriment of measuring the full range of inputs, processes, and outputs making up the innovation process.¹²¹

C. *Objective Versus Proximate Monitoring*

Innovation is thus facilitated by decentralization and an emphasis on strategic internal control. These structures can increase value to shareholders because they reduce an important type of agency cost faced by innovative firms. Agency costs are a measure of the loss in value to shareholders (the principals) from directors and managers (the agents) failing to act in the best interests of shareholders.¹²²

One type of agency cost comes from managers failing to proactively use assets to benefit shareholders. To the extent a company has the potential to gain from innovation, shareholders are better off when managers undertake actions to adapt to economic change and commit themselves to long-term projects. However, these activities are relatively risky for managers to undertake because they require commitment to projects whose short-term returns are uncertain. Whereas shareholders can diversify their investment portfolios, the risks corporate managers face are non-diversifiable. Accordingly, managers have a tendency to take on less risk and other innovation-related activities than shareholders desire.¹²³ Managers may focus on short-term gains, more objectively demonstrable performance, and maintaining current production routines rather than on long-term innovation projects and strategic renewal.¹²⁴ If managers are too myopic, focusing on short-term financial outcomes when they could be engaging in innovation, shareholders bear an agency cost from foregone benefits. Firms with a high innovation potential thus bear myopia costs from managers who systematically fail to invest in innovation. To reduce

121. *See id.* 15-17.

122. Agency costs are the economic measure of the divergence of interests between managers and shareholders. Such costs include: those borne by shareholders to monitor, control and give managers appropriate incentives; those borne by managers to convince shareholders they will act in their best interests (bonding costs); and the loss from any remaining gap between their interests (the residual loss). Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 308 (1976). For a list of some factors affecting the size of agency costs, *see id.* at 328-29.

123. *See* Munari & Sobrero, *supra* note 10, at 5 (noting that managers are generally risk averse and use strategies that increase short-term returns but decrease long-term gains); *see also* Jensen & Meckling, *supra* note 122, at 313 (noting that "as the manager's ownership claim falls, his incentive to devote significant effort to creative activities such as searching out new profitable ventures falls").

124. Munari & Sobrero, *supra* note 10, at 5-6, 9; Holmstrom, *supra* note 36, at 324-25 (finding that insufficient risk-taking exists in large public corporations because of management's tendency to choose projects with more easily measurable short-term returns).

myopia and to facilitate innovation, innovative firms may increase decentralization and adopt more strategic control mechanisms.

While decentralization and strategic control may facilitate innovation, however, these structures may not maximize overall value to shareholders. This is because a firm adopting such structures may increase agency costs from managers opportunistically misusing shareholder funds to obtain private benefits.¹²⁵ In general, greater informational asymmetries between managers and their monitors (e.g., independent directors and investors) increase managerial opportunism. Asymmetries give managers the ability to benefit themselves because in such situations the costs of monitoring are high and it is difficult for outside monitors to evaluate management's conduct.¹²⁶ Innovation activities are difficult to measure or evaluate in the short-run, in part because they utilize tacit and particularized knowledge and therefore create information asymmetries between corporate monitors and managers.¹²⁷ Accordingly, to the extent they increase information asymmetries, governance structures that facilitate innovation may increase the ability of managers to behave opportunistically. For example, undertaking R&D allows managers to entrench themselves against newcomers, forego dividend payments to shareholders, and invest in projects that benefit themselves at the expense of the company.¹²⁸

125. See Oliver Hart, *Corporate Governance: Some Theory and Implications*, 105 *ECON. J.* 678, 681 (1995) (discussing how the need for corporate governance arises from the combination of agency costs and incomplete contracts); Jensen & Meckling, *supra* note 122, at 312, 325 (arguing that limitations on managerial discretion reflect a tradeoff between "impos[ing] costs on the firm because they limit [a manager's] ability to take full advantage of some profitable opportunities" such as those exploited through entrepreneurship, and benefiting the firm by "limiting [a manager's] ability to harm the stockholders while making himself better off"); see also Lynn A. Stout, *The Mythical Benefits of Shareholder Control*, 93 *VA. L. REV.* 789, 791 (2007) (noting that delegation of decision-making to a board of directors "while increasing agency costs [from opportunism], also promotes efficient and informed decisionmaking, discourages intershareholder opportunism, and encourages valuable specific investment in corporate team production").

126. See Henry Hansmann & Reinier Kraakman, *The Basic Governance Structure*, in *THE ANATOMY OF CORPORATE LAW: A COMPARATIVE AND FUNCTIONAL APPROACH* 21 (Reinier Kraakman et al. eds., 2004) (noting that a core agency problem arises because "the agent commonly has better information than does the principal about the relevant facts, [and] the principal cannot costlessly assure himself that the agent's performance is precisely what was promised. As a consequence, the agent has an incentive to act opportunistically . . ."). This dynamic is well developed in the corporate governance literature dealing with the optimal portion of outside directors on a board. See Boone et al., *supra* note 95, at 70-71 (describing various formulations of the "monitoring hypothesis" which includes the view that "firms facing greater information asymmetry will have smaller and less independent boards because of the higher costs of monitoring").

127. See David Aboody & Baruch Lev, *Information Asymmetry, R&D, and Insider Gains*, 55 *J. FIN.* 2747, 2749-50 (2000) (identifying the idiosyncratic nature R&D investment that gives rise to relatively high information asymmetries).

128. See Kee H. Chung et al., *Corporate Governance and Market Valuation of Capital*

To maximize value to shareholders, therefore, a firm must choose between reducing agency costs from myopia and reducing those from opportunism.¹²⁹ With respect to choosing monitoring devices, this choice gives rise to the fundamental governance tradeoff between proximate and objective monitoring. As identified by Arnoud Boot and Jonathan Macey,

Proximity exists when monitors maintain close contact with management and participate in important decisions on a real-time basis. Objectivity exists when monitors . . . remain distant from management and evaluate management's performance without influence by management.

A tradeoff between monitoring functions exists because monitors that obtain close proximity necessarily forego objectivity, and objective monitors must maintain sufficient distance from management, which results in a loss of the advantages of proximity.¹³⁰

As compared to outside monitors, proximate monitors better facilitate knowledge generation and communication because their close contact with management and real-time participation in decision making means that they have more knowledge about the company and are in a better position to communicate tacit knowledge efficiently. Likewise, proximate monitors are in a better position to mitigate the informational asymmetries involved with giving substantial discretion to decision-makers to adapt to change. The more in-depth knowledge of proximate monitors also endows them

and R&D Investments, 12 REV. FIN. ECON. 161, 162 (2003) ("It is well known that, absent monitoring and bonding, corporate executives can and often do make suboptimal investment decisions in order to maximize their own utility at the expense of shareholders. Consequently, the level of capital and R&D expenditures per se may not be a proper indicator to judge the effect of those expenditures on firm value."); Andrei Shleifer & Robert W. Vishny, *Management Entrenchment: The Case of Manager-Specific Investments*, 25 J. FIN. ECON. 123, 123-32 (1989) (describing managerial incentives to invest in projects involving manager-specific knowledge so as to increase the cost of replacing the manager); see also Munari & Sobrero, *supra* note 10, at 13 ("[T]he decision to carry on R&D activities inherently involves high agency costs, since R&D projects are typically risky, unpredictable, long-term oriented and multistage, labour intensive and idiosyncratic."); Rajesh K. Aggarwal & Andrew A. Samwick, *Empire Builders and Shirkers: Investment, Firm Performance, and Managerial Incentives*, 12 J. CORP. FIN. 489, 489-515 (reviewing theories of agency costs from empire building); Zahra, *supra* note 68, at 1716 ("High R&D spending may also reflect high agency costs, with managers attempting to keep funds within a firm rather than distribute them to shareholders.").

129. See Foss & Klein, *supra* note 51, at 73 (noting that "various constraints firms impose on employees . . . to curb destructive entrepreneurship [e.g., opportunism] may have the unwanted side effect that productive entrepreneurship is stifled"); Holmstrom, *supra* note 36, at 322-23 (noting that increasing monitoring and influence over managers undermines innovation).

130. Arnoud W.A. Boot & Jonathan R. Macey, *Monitoring Corporate Performance: The Role of Objectivity, Proximity, and Adaptability in Corporate Governance*, 89 CORNELL L. REV. 356, 357 (2004).

with greater capabilities to employ strategic control mechanisms to evaluate and steer the long-term progress of innovation projects. In this sense, proximate monitoring encompasses the activity of strategic monitoring, except that proximate monitoring also takes place as projects are being undertaken, not just after the fact. Proximate monitoring is therefore the type of monitoring most aligned with decentralization and strategic control in reducing myopia and facilitating innovation. While proximate monitoring may be strongest when undertaken by company insiders such as executive managers, outsiders (e.g., institutions with concentrated ownership of shares) may also engage in proximate monitoring.

Proximate monitoring entails a potential cost, however, because proximate monitors may be “captured” by management and thus fail to evaluate managers in the best interests of shareholders.¹³¹ Management capture increases informational asymmetries and thereby increases opportunism costs. To reduce opportunism costs, a corporation may increase objective monitoring of managers. Objective monitoring structures, in contrast to structures facilitating proximate monitoring, include increasing the portion of independent directors on a board and placing a greater emphasis on internal control over financial reporting.¹³² Subjecting agents to civil and criminal liability may also reduce agency costs incurred through misappropriation of assets and fraud. Yet because there is a tradeoff between proximate and objective monitoring, increasing objective monitoring likely comes at the expense of increasing myopia and reducing innovation activity.

How a value-maximizing company should strike the balance between objective and proximate monitoring depends in part upon whether it suffers from relatively higher agency costs from myopia or from opportunism. All things being equal, investors in companies with high innovative potential will likely benefit more from proximate monitoring than objective monitoring. As corporations become extremely large and diversified in their operations, however, the potential for opportunism may outweigh the costs from myopia such that an emphasis on objective monitoring is preferable even amidst a high level of innovation.¹³³ Thus, the proper mix of objective and proximate monitoring that maximizes value to shareholders will differ among public companies.

131. *Id.* at 359.

132. Jensen & Meckling, *supra* note 122, at 323.

133. See Boone et al., *supra* note 95, at 71 (reviewing corporate governance literature which finds that “[t]he net benefits of extra [objective] monitoring increase with managers’ opportunities to consume private benefits [i.e., act opportunistically], but decrease with the cost of monitoring” such that “optimal boards will employ large numbers of outside directors, and be larger in overall size, when managers’ private benefits are high and the cost of monitoring is low”).

III. THE IMPACT OF SOX AND RELATED REFORMS

SOX and related corporate governance reforms are the most wide-ranging and extensive rules to apply to public companies since passage of the Securities Act of 1933 and the Securities Exchange Act of 1934.¹³⁴ Evidence thus far demonstrates that SOX likely had a disproportionate and negative impact on the shareholders of smaller public companies.¹³⁵ This Part suggests that the cumulative impact of SOX may also have a disproportionate and negative impact on the stakeholders of innovative public companies. While any one of the effects of SOX described below may not be significant when taken in isolation, when combined, their net effect likely undermines the innovative potential of a significant portion of U.S. publicly listed companies.

SOX's three primary changes to the U.S. federal corporate governance regime were to increase objective monitoring of managers by outsiders, to increase the emphasis on financial control, and to heighten civil and criminal penalties for violations of the federal securities laws. The legislation requires each director on the board's audit committee to be independent.¹³⁶ The New York Stock Exchange ("NYSE") and NASDAQ listing standards, passed in response to SOX and a request by the Securities and Exchange Commission (SEC),¹³⁷ also require a majority of a

134. The Securities Act and the Securities Exchange Act are codified at 15 U.S.C. §§ 77a-77aa (2000) and at 15 U.S.C. §§ 78a-78nn (2000), respectively.

135. See, e.g., Ehud Kamar et al., *Sarbanes-Oxley's Effects on Small Firms: What is the Evidence?* 27 (Harvard Law School, John M. Olin Center for Law, Economics and Business, Working Paper No. 588, 2007) ("[T]he evidence offers qualified support for the view that SOX had a negative effect on the value of small firms, at least initially.").

136. The Sarbanes-Oxley Act of 2002 § 301, 15 U.S.C. § 78j-1(m)(3)(A) (2002). An inside/non-independent director is typically a member of the corporation's senior management, and may own company stock and stock options as incentive compensation. By contrast, under SOX and the exchanges' listing standards, an independent director is not a member of management (or otherwise employed by the corporation) and, other than receiving a fee for serving as a director, has no financial ties to the corporation (e.g., as a consultant or through greater than 10 percent stock ownership, or familial ties to executives). See Donald C. Clarke, *Three Concepts of the Independent Director*, 32 DEL. J. CORP. L. 73, 84-94 (2007) (discussing the general characteristics of a director on the board). An outside director is not a corporate employee, but may otherwise be tied to the corporation through financial or personal ties. *Id.* at 99 (stating that an outside director is "any director who is not a company employee, without regard to whether she meets a standard of independence") (internal citation omitted). Independent and outside directors typically do not work for the company full-time.

137. SEC Press Release, Pitt Seeks Review of Corporate Governance, Conduct Codes, Feb. 13, 2002, available at <http://www.sec.gov/news/press/2002-23.txt> ("As part of an ongoing effort to bolster investor confidence, Chairman Harvey L. Pitt of the Securities and Exchange Commission has asked the New York Stock Exchange and Nasdaq to review

company's board to be independent (the NYSE in particular requires wholly independent nominating/governance and compensation committees).¹³⁸ Under SOX, the audit committee must also include a financial expert.¹³⁹ SOX also seeks to improve monitoring of management by prohibiting external auditors from providing any non-audit services to issuers, requiring auditors to rotate every five years, and requiring attorneys to report any violations of securities laws or breach of fiduciary duty up the corporate hierarchy to in-house attorneys, the CEO, and ultimately the audit committee.¹⁴⁰

SOX Section 404 ("Section 404") requires management to maintain, evaluate, and report on internal control over financial reporting.¹⁴¹ Internal controls are meant to provide reasonable assurance that financial reporting and preparation of financial statements are reliable for investors and in accordance with generally accepted accounting principles ("GAAP").¹⁴² Management must produce an annual report about the company's internal control that evaluates its effectiveness and discloses any material weaknesses.¹⁴³ Under Section 404, a material weakness in internal control must be reported when there is "a reasonable possibility" that a material financial misstatement "will not be prevented or detected on a timely

corporate governance and listing standards, including the important issues of officer and director qualifications . . .").

138. NYSE, Inc., Listed Company Manual § 303A(1)-A(2) (2002) (requiring majority board independence); NYSE, Inc., Listed Company Manual § 303A(4)-(6), A(7)(c) (requiring independent audit, nominating/corporate governance and compensation committees); NASDAQ, Inc., Manual § 4350(c)(1) (2006).

139. The Sarbanes-Oxley Act of 2002 § 407, 15 U.S.C. § 7265 (2002).

140. The Sarbanes-Oxley Act of 2002 § 201(a), 15 U.S.C. § 78j-1(a) (2002) (prohibiting the provision of non-audit services by an auditor); The Sarbanes-Oxley Act of 2002 § 203, 15 U.S.C. § 78j-1(j) (2002) (prohibiting a registered public accounting firm from providing audit services if the lead auditor partner provided audit services in each of the five previous years); The Sarbanes-Oxley Act of 2002 § 307, 15 U.S.C. § 7245 (2002) (requiring corporate attorneys to report evidence of a violation of securities laws or breach of fiduciary duty to the head in-house counsel or CEO and, if the response is inappropriate, to report to the audit committee, to another committee comprised solely of independent directors, or to the board as a whole).

141. 13 U.S.C. § 7262 (2002).

142. 17 C.F.R. § 240.13a-15(f) (2007); 17 C.F.R. § 240.15d-15(f) (2007). "Reasonable assurance" does not require perfection in financial reporting: internal control procedures are not expected to "prevent or detect all misstatements, whether unintentional errors or fraud." 71 Fed. Reg. 77,636, 77,639 (December 27, 2006).

143. The Sarbanes-Oxley Act of 2002 § 404, 15 U.S.C. § 7262; 17 C.F.R. § 229.308(a)(1)-(3) (2007). Section 404 and the SEC's corresponding regulations make management responsible for providing GAAP-compliant control assessments. Scott A. Taub, Deputy Chief Accountant, U.S. Sec. Exch. Comm'n, Address at SEC and Financial Reporting Conference, The SEC's Internal Control Report Rules and Thoughts on the Sarbanes-Oxley Act (May 29, 2003) ("What is new in these [SOX implementing] rules, as far as management's responsibilities, is the requirement to evaluate the effectiveness of those controls and provide a report on that evaluation.").

basis.”¹⁴⁴ Reporting a material weakness in control does not mean that a financial misstatement was made or is likely to be made, but it may be an indication of lower quality financial reporting.¹⁴⁵

On a quarterly basis, management must also disclose any material changes to the internal control system.¹⁴⁶ Section 302 of SOX requires that the CEO and chief financial officer (CFO) annually certify the truth of the company’s financial and non-financial disclosures, affirm their responsibility for maintaining internal control, publicly disclose any significant changes in internal controls, and internally disclose to auditors and the audit committee any weaknesses in the control system.¹⁴⁷ A public company’s annual report must also include a statement that an outside auditor reviewed (attested to) management’s internal control assessment,¹⁴⁸ and provide the auditor’s attestation report.¹⁴⁹ SOX also established the Public Company Accounting Oversight Board, a quasi-public entity charged with promulgating new auditing standards and monitoring and disciplining external auditors.¹⁵⁰ Finally, SOX increased penalties for violations of the federal securities laws, including increased criminal liability for false certifications and other types of fraud,¹⁵¹ and allows the

144. 17 C.F.R. 210.1-02 (2007).

145. See Kam C. Chan et al., *Earnings Management of Firms Reporting Material Internal Control Weaknesses Under Section 404 of the Sarbanes-Oxley Act*, AUDITING: J. PRACTICE THEORY (forthcoming) (finding some evidence of more earnings management among firms that report internal control weaknesses), available at <http://ssrn.com/abstract=1078522>; Jeffery Doyle et al., *Accruals Quality and Internal Control over Financial Reporting*, 82 ACCT. REV. 1141 (2007).

146. 17 C.F.R. § 240.13a-15(d) (2007); 17 C.F.R. § 240.15d-15(d) (2007); 17 C.F.R. § 229.308(c) (2007).

147. 15 U.S.C. § 7241(a) (2002); see also Foreign Corrupt Practices Act of 1977, 15 U.S.C. §§ 78dd-1-78dd-3 (2002) (first U.S. statutory provision requiring companies to maintain internal control).

148. 17 C.F.R. § 229.308(a)(4) (2007).

149. 17 C.F.R. § 229.308(b) (2007). Registered public accounting firms auditing a public company’s financial statements are required to “attest to, and report upon” management’s assessment of internal control. 17 C.F.R. § 210.2-02(f) (2005). An auditor’s attestation must be made in accordance with standards issued or adopted by the Public Company Accounting Oversight Board. Management’s Report on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports, 68 Fed. Reg. 36,636, 36,637 (June 18, 2003) (to be codified at 17 C.F.R. parts 210, 228, 229, 240, 240, 270 and 274).

150. The Sarbanes-Oxley Act of 2002 § 101, 15 U.S.C. § 7211 (2002).

151. The Sarbanes-Oxley Act of 2002 § 807(a), 18 U.S.C. § 1348 (2002) (requiring increased penalties for defrauding shareholders or publicly held companies); The Sarbanes-Oxley Act of 2002 § 903, 18 U.S.C. § 1341 (2002) (requiring increased penalties for mail and wire fraud); The Sarbanes-Oxley Act of 2002 § 906(a), 18 U.S.C. § 1350(c) (2002) (requiring criminal liability for false certifications); The Sarbanes-Oxley Act of 2002 § 1106, 15 U.S.C. § 78ff (2002) (requiring increased penalties for violations of the Securities Exchange Act).

SEC to bar those it deems “unfit” to serve as directors and officers.¹⁵²

A. *SOX and Agency Costs*

By increasing outside monitoring and the emphasis on financial control, SOX aims to reduce agency costs from opportunism relating to management’s involvement with financial reporting.¹⁵³ In response to SOX, some firms may have improved the quality of their financial statements.¹⁵⁴ In addition, SOX compliance may be able to facilitate some aspects of innovation. SOX had the effect of requiring many companies to change their information technology capabilities, which may have the consequence of increasing the communication of innovation-relevant knowledge within a company.¹⁵⁵ Nonetheless, because SOX mandates that all public companies increase outside monitoring and financial control, and the law’s other related consequences, SOX likely has the more widespread and significant effect of reducing some companies’ ability to engage in proximate monitoring to facilitate innovation.

This effect is important because, in addition to the general considerations regarding management’s tendency to not take on as much risk as is optimal for investors, there is reason to believe that the costs of myopia are significant. In a study based upon a broad cross-section of public corporations, Aggarwal and Samwick found that increasing managerial incentives through equity ownership did not increase managerial opportunism, but rather increased investments and improved performance for all levels of stock-based compensation.¹⁵⁶ They use this finding to support the proposition that the principal source of agency costs in public companies is managers failing to expend enough effort to, for

152. The Sarbanes-Oxley Act of 2002 § 305(a)(1)-(2), 15 U.S.C. § 78u (2002).

153. See Larry E. Ribstein, *Sarbox: The Road to Nirvana*, 2004 MICH. ST. L. REV. 279, 282-83 (2004) (noting that SOX “tries to ensure that agency costs and corporate fraud do not again run rampant by requiring more watchers and stiffer penalties”).

154. See generally Doyle et al., *supra* note 145; Kam C. Chan et al., Earnings Management of Firms Reporting Material Internal Control Weaknesses Under Section 404 of the Sarbanes-Oxley Act, *AUDITING: A JOURNAL OF PRACTICE & THEORY*, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1078522; Jian Zhou, *Financial Reporting After the Sarbanes-Oxley Act: Conservative or Less Earnings Management?*, 20 RES. ACCT. REGULATIONS (2007).

155. See Computer Associates, *A Key Ingredient for Compliance: Automation 2* (Jan. 2006) (arguing that SOX “presents an opportunity to re-engineer and improve existing financial business processes, enhancing information sharing and integrity”); Philipp Koellinger, *Why IT Matters—An Empirical Study of E-business Usage, Innovation, and Firm Performance*, DIW Berlin Discussion Papers 495 (2005), available at <http://www.diw.de/documents/publikationen/73/43300/dp495.pdf> (arguing that successfully implementing information technology increases innovation).

156. See Aggarwal & Samwick, *supra* note 128, at 491 (reviewing theories of agency costs from empire building).

example, start new product lines.¹⁵⁷ Aggarwal and Samwick's finding strongly suggests that increasing objective monitoring to reduce managerial opportunism is unlikely to make shareholders in a significant portion of public companies better off. Accordingly, to the extent myopia is the result of failing to expend additional effort towards long-term activities, reducing myopia is a more important governance objective than reducing opportunism.

Prior to SOX, companies whose investors would benefit from relatively higher outside monitoring and more emphasis on financial control likely had *already* adopted such structures.¹⁵⁸ Yet SOX requires all companies to increase objective monitoring (i.e., more independent directors and increased emphasis on internal control over financial reporting), including companies for whom the optimal governance structure involves relatively more proximate monitoring (i.e., decentralization and strategic control). Because companies generally adopt the structures that maximize value to shareholders, it is unlikely that SOX's mandatory governance structures, which attempt to reduce opportunism, would make investors in such companies better off.¹⁵⁹ To the contrary, the evidence described in this Article suggests that the cumulative impact of SOX is to tip the scales in innovative firms toward too much—and hence value-reducing—objective monitoring.

The remainder of this Article uses the framework developed in Parts I and II to analyze the impact of SOX (and the related exchange regulations) on innovation. In discussing the empirical literature, common measures of innovation, such as patent activity and R&D spending, are utilized as proxies.¹⁶⁰ However, such indicators are imperfect measures of innovation. Not all innovations are patentable and only a small proportion of patents ultimately lead to successfully commercialized products.¹⁶¹ Furthermore, R&D spending is merely an input into the innovation process. As such, it does not guarantee innovation will occur and is not required for all

157. See *id.* at 490, 514 (concluding that their research finds no support for the general theory that managers act opportunistically, (the “private benefits model”), but finding support “for the idea that managers underinvest”).

158. See Aggarwal & Williamson, *supra* note 94, at 23-24 (finding that prior to SOX share prices were already higher for firms voluntarily adopting governance structures similar to those mandated by SOX). This implies that prior to SOX, diversified investors were generally bearing the optimal amount of agency costs from opportunism. See HENRY N. BUTLER & LARRY E. RIBSTEIN, *THE SARBANES-OXLEY DEBACLE: WHAT WE'VE LEARNED; HOW TO FIX IT* 23 (2006) (explaining that there is an optimal amount of fraud relative to maximizing shareholder value).

159. See Chidambaran et al., *supra* note 2, at 32-33 (finding that firms adopting “good” governance structures did not improve their performance).

160. Keith Smith, *Measuring Innovation*, in *THE OXFORD HANDBOOK OF INNOVATION*, *supra* note 8, at 152.

161. Jaruzelski et al., *supra* note 10, at 52-53.

innovations.¹⁶² As previously noted, R&D spending may even reflect managerial entrenchment and other types of value-destroying activity.¹⁶³ Nevertheless, the impact of SOX on patent activity and R&D spending is important because such activities are reflective of the long-term risky undertakings characteristic of corporate innovation. Empirical research that uses these variables likely illustrates the more general impact of SOX on innovation.

B. Assessment and Certification of Internal Control

Management's new SOX-mandated duties to assess and report on internal control over financial reporting likely decrease their propensity to engage in innovation or related activities. Three interrelated grounds provide support for this conclusion.

1. Increased Emphasis on Financial Controls

SOX's increased disclosure requirements relating to internal control tend to undermine a long-term, innovation orientation. The very purpose of Section 404 is to improve the accuracy of numerical financial statements under GAAP.¹⁶⁴ Furthermore, in part due to SOX's requirement that audit committees be composed of one financial expert, the proportion of directors qualified as financial experts (e.g., CFOs, accountants) went from ten percent in 1998 to twenty-one percent by 2004.¹⁶⁵ Management's duty to evaluate and report on the effectiveness of internal controls under Section 404, and the presence of more financial experts on boards, is likely to increase companies' emphasis on financial versus strategic control. Under SOX, short-term financial reporting takes on a new level of significance.¹⁶⁶

162. Peggy M. Lee, *A Comparison of Ownership Structure and Innovations of US and Japanese Firms*, 26 *MANAGERIAL & DECISION ECON.* 39, 40 (2005) ("Not all R&D is productive, and increased R&D does not necessarily translate to increased innovations.") (citations omitted).

163. See *supra* note 128 and accompanying text.

164. Management's Report on Internal Control Over Financial Reporting, 71 Fed. Reg. 77,635, 77,641 (Dec. 27, 2006) (to be codified at 17 C.F.R. parts 210, 240 and 241) ("Management should assess whether its controls are designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles . . .").

165. James S. Linck et al., *The Effects and Unintended Consequences of the Sarbanes-Oxley Act on the Supply and Demand for Directors* 30-31 (Feb. 4, 2008) (unpublished research paper, on file with University of Georgia Terry School of Business), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=902665.

166. See Peter J. Wallison, Arthur F. Burns Fellow in Fin. Market Studies, Am. Enter.

In addition, innovation involves the use of intangible knowledge assets, including activities such as R&D, intellectual property rights, and organizational advantages.¹⁶⁷ However, financial reporting under GAAP may not adequately reflect knowledge assets.¹⁶⁸ For example, R&D spending is expensed under GAAP, but changes in R&D productivity are not reported in financial statements, so merely being GAAP-compliant does not keep shareholders informed about changes in the value of R&D investments.¹⁶⁹ To the extent SOX increases investor attention to GAAP-compliant financial statements, it thus increases informational asymmetries between managers and those who monitor them, thereby increasing the potential for opportunism. To compensate for increased informational asymmetries due to SOX's emphasis on GAAP, corporations may adopt structures that reduce innovative activity. For example, while increasing objective monitoring may undermine a company's ability to innovate,¹⁷⁰ an innovative corporation reliant upon intangibles, and required by SOX to increase its emphasis on GAAP-compliant financial statements, may nonetheless increase the independence of its board to offset the increase in informational asymmetries resulting from SOX. While such a change may decrease opportunism, it would likely also decrease a company's innovation activities. In this way, SOX's emphasis on financial reporting under GAAP has a particularly negative impact on innovation activities utilizing intangible assets.

Empirical studies generally support the proposition that SOX's additional emphasis on financial control decreases innovation activities for all public companies, regardless of size.¹⁷¹ Hitt et al. find a positive relationship between an emphasis on strategic control and R&D, and a negative relationship between emphasizing financial controls and R&D.¹⁷²

Inst. for Pub. Policy Research, Address at American Enterprise Institute Event on Audited Earnings, Poor Diagnosis, Poor Prescription: The Error at the Heart of the Sarbanes-Oxley Act (Jan. 23, 2003) (noting that SOX's "principal effect was to enshrine the audited financial statement—prepared under [GAAP]—including a balance sheet, income statement and statement of cash flow, as the central financial disclosure of companies whose shares are traded in the public securities markets").

167. See Olufunmilayo B. Arewa, *Measuring and Representing the Knowledge Economy: Accounting for Economic Reality Under the Intangibles Paradigm*, 54 BUFF. L. REV. 1, 10-11 (2006) (defining intangibles); *supra* Part I.A.

168. See Arewa, *supra* note 167, at 45 ("As a result of the intangibles paradigm shift, financial statements have become less informative [to shareholders] from an accounting and economic perspective."); Wallison, *supra* note 166 (noting that "GAAP financial statements are inherently unable to produce accurate measures of assets and earnings for companies that rely on intangible assets").

169. Aboody & Lev, *supra* note 127, at 2750.

170. See *infra* Part III.C.

171. Studies suggesting that SOX already decreased innovation activities are discussed in the next section.

172. Hitt et al., *supra* note 115, at 1095-96, 1109.

Other empirical studies have found similar results, and none have found the contrary.¹⁷³ In a study of Chinese firms, Xinmin et al. found that while strategic control facilitates radical innovation, it undermines incremental innovations.¹⁷⁴ This finding is consistent with the proposition that substantial innovations tend to be long-term in nature, whereas smaller, incremental innovations can be completed on a short-term and more readily-verifiable basis. Overall, the positive correlation between strategic control and R&D suggests that decision making based on in-depth operational knowledge is in some ways more important for innovation than quantitative information or data from financial control. Operational knowledge increases in importance in dynamic environments where success depends upon bearing risks that are not subject to straightforward quantification.¹⁷⁵ SOX's emphasis on financial control thus likely undermines innovation in firms that, prior to the law, relied more heavily on strategic control to reduce the costs of myopic decision-making.

2. Financial Reporting Risk and Innovative Risk-Taking

The likely negative impact upon innovation from increasing an emphasis on financial controls is compounded by an underlying tension between management's duty to perform a risk-based assessment of internal control under Section 404 and management's undertaking of risky innovation activities.¹⁷⁶ SOX seems to have increased the likelihood of having to disclose an internal control weakness when undertaking innovation. Accordingly, because disclosure of a material weakness in control may increase a company's cost of capital and decrease the price of its stock even when no financial misstatements occur,¹⁷⁷ SOX may have made managers more reluctant to engage in innovation activities solely to avoid having to disclose a weakness in internal control.

The SEC's guidance regarding management's assessment of internal control under SOX states that management should employ a "top-down,

173. Munari & Sobrero, *supra* note 10, at 11.

174. Liu Xinmin et al., *The Impact of a Firm's Internal Control Mechanisms on the Choice of Innovation Mode*, 1 FRONTIERS BUS. RES. CHINA 91, 99-100 (2007).

175. See Munari & Sobrero, *supra* note 10, at 12.

176. This tension is reflected in a post-SOX director survey which found a tension between directors' increased risk-management role under SOX and management's risk-taking role. ERNST & YOUNG, BOARD MEMBERS ON RISK: LEVERAGING FRAMEWORKS FOR THE FUTURE 11 (2006).

177. See Jaqueline S. Hammersley et al., *Market Reactions to the Disclosure of Internal Control Weaknesses and to the Characteristics of those Weaknesses under Section 302 of the Sarbanes Oxley Act of 2002*, 13 REV. ACCT. STUD. 141, 144-45 (2007); Hollis Ashbaugh-Skaife et al., *The Effect of Internal Control Deficiencies on Firm Risk and Cost of Equity* 4-6 (Feb. 2007) (unpublished research paper), available at <http://ssrn.com/abstract=896760>.

risk-based” approach.¹⁷⁸ This means that management must identify the risks of inaccurately reporting financial statements, design internal controls to adequately prevent or detect financial misstatements, and gather more evidence and perform more extensive testing in areas deemed to have more financial reporting risk.¹⁷⁹ The SEC identifies several characteristics of transactions and their controls that increase the risk of financial misstatement. These characteristics include transactions involving higher agency costs (e.g., where controls are more susceptible to being overridden by management¹⁸⁰), high-risk transactions susceptible to substantial economic loss, controls requiring substantial subjective judgment or accounting complexity to be properly implemented, interdependent controls, and transactions subject to economic and technological change.¹⁸¹ In addition, a SOX compliance guide notes that a common source of material weakness in internal controls is “[i]nadequate controls associated with the recording of nonroutine, complex, and unusual transactions.”¹⁸²

178. Commission Guidance Regarding Management’s Report on Internal Control Over Financial Reporting Under Section 13(a) or 15(d) of the Securities Exchange Act of 1934, 72 Fed. Reg. 35,324, 35,324 (June 27, 2007) (to be codified at 17 C.F.R. part 241) [hereinafter SEC Guidance] (promulgating interpretative guidance which “sets forth an approach by which management can conduct a top-down, risk-based evaluation of internal control over financial reporting”). Although the SEC’s guidance is technically not the exclusive way to evaluate internal control, it is at least broadly indicative of what the SEC considers to be the types of transaction characteristics contributing to the risk of financial misstatement, and it is very likely to be relied upon by attorneys, judges, and companies in determining the contours of legal risk. See Amendments to Rules Regarding Management’s Report on Internal Control Over Financial Reporting, 72 Fed. Reg. 35,310, 35,310 (June 27, 2007) (to be codified at 17 C.F.R. parts 210, 228, 229 and 240) (noting that the SEC’s proposed guidance is one of many ways to conduct an evaluation of internal control). Furthermore, the SEC’s top-down risk-based approach is not entirely new. At least a decade before SOX, the importance of evaluating the risk of financial misstatement was widely recognized. See COMMITTEE ON SPONSORING ORGANIZATIONS OF THE TREADWAY COMMISSION, INTERNAL CONTROL—INTEGRATED FRAMEWORK (2004) [hereinafter COSO]; MICHAEL RAMOS, HOW TO COMPLY WITH SARBANES-OXLEY SECTION 404: ASSESSING THE EFFECTIVENESS OF INTERNAL CONTROL 49 (2d ed. 2006) (recognizing that the 1992 COSO framework identifies new products, new activities, and the integration of new technology as factors that increase financial reporting risk). COSO is a private-sector body made up of several major executive and accounting related professional organizations that publish guidance on internal control and other related financial reporting matters. The SEC considers the COSO control framework to be suitable for management’s assessment under Section 404. See SEC Guidance at 3 n.10 (providing a history on the Sarbanes-Oxley Act in relation to section 404).

179. SEC Guidance, *supra* note 178, at 35,325, 35,327, 35,331.

180. For a summary of the issues involved with so-called “management override,” see AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS, MANAGEMENT OVERRIDE OF INTERNAL CONTROLS: THE ACHILLES’ HEEL OF FRAUD PREVENTION (2005).

181. SEC Guidance, *supra* note 178, at 35,330, 35,335.

182. STEPHEN M. BAINBRIDGE, THE COMPLETE GUIDE TO SARBANES-OXLEY: UNDERSTANDING HOW SARBANES-OXLEY AFFECTS YOUR BUSINESS 219 (2007).

Guidance by a leading audit firm also finds that firms must avoid capitalizing intangible assets before a new product is technologically feasible.¹⁸³

Under SOX's specific top-down, risk-based approach, management's assessment of internal control under SOX must place a special emphasis on innovation activities. Because innovation requires management to have substantial discretion to focus on long-term activities not easily measured in the short term, it necessarily involves transactions where managers can potentially manipulate financial data and act opportunistically at the expense of shareholders. Innovation and entrepreneurship also tend to be higher risk activities that rely upon manager's subjective judgment regarding the potential value of hard-to-quantify assets and opportunities. Accordingly, subjective judgment may be required to properly implement controls for such transactions. Furthermore, because many of the activities involved in innovation are interdependent and organization-wide, changing controls over one activity may impact controls over another activity. Innovation activities may also involve non-routine and unusual transactions. Finally, properly accounting for innovation activities inherently creates the risk of capitalizing on the value of intangible assets (i.e., ideas) before a new product is commercially feasible.

Innovation and related activities thus possess the same characteristics identified by the SEC and others as contributing to the risk of financial misstatements. Studies of post-SOX disclosures of internal control weaknesses found more frequent disclosures of control weaknesses in companies operating in either dynamic business environments or undergoing rapid growth and internal change.¹⁸⁴ Because innovation activities are more likely to be found in companies subject to change or undergoing organizational change,¹⁸⁵ these studies provide indirect empirical support that innovation activities tend to be a source of higher reporting risk than more routine, non-innovation activities. In addition, a survey by Financial Executives International found that public companies with a decentralized operational structure experienced over twice the internal control compliance costs (four million dollars) as those with

183. ERNST & YOUNG, EMERGING TRENDS IN INTERNAL CONTROLS: FOURTH SURVEY AND INDUSTRY INSIGHTS 126 (2005).

184. Hollis Ashbaugh-Skaife et al., *The Discovery and Reporting of Internal Control Deficiencies Prior to SOX-Mandated Audits*, 44 J. ACCT. & ECON. 166, 190 (2007) (finding relatively more internal control weaknesses among firms that are faster growing, have more operating segments and foreign transactions, and engaging in mergers and acquisitions and restructurings); Jeffrey Doyle et al., *Determinants of Weaknesses in Internal Control Over Financial Reporting*, 44 J. ACCT. & ECON. 193, 220 (2007) (finding more disclosures of material weaknesses in internal control from firms with more operating segments, engaging in foreign currency translation, and that are smaller and younger).

185. See *supra* Parts I.B and I.D.

centralized operations.¹⁸⁶ Because innovative companies tend to have relatively decentralized operations, this study supports the related proposition that SOX places a relatively higher internal control burden on such firms. Finally, a case-study of small and medium sized companies required to comply with SOX revealed that delays in internal control assessments became more pronounced as transaction complexity increased.¹⁸⁷ This finding is consistent with the proposition that, because innovation-related transactions tend to be more complex from a control or accounting perspective, innovation transactions and controls are a more costly aspect of the SOX-mandated internal control assessment process.

Because innovation activities are a relatively higher source of financial reporting risk, they are also likely a more costly component of management implementing and maintaining a control system that provides reasonable assurance of financial statement accuracy under Section 404. Innovation-related controls may generally require more extensive documentation and testing under a top-down, risk-based approach. All things being equal, management is less likely to engage in innovation post-SOX because doing so increases the risk of having to report a material weakness in internal control even where financial statements are not actually compromised.¹⁸⁸ A guide that advises how to comply with SOX's internal control requirements suggests that one straightforward way to reduce financial reporting risk is to "choos[e] to *not* undertake the activity that gives rise to the risk."¹⁸⁹ The post-SOX empirical record thus far is consistent with such advice.

A study by Bargerion et al. compared the differences between 2,290 public corporations in the U.S. and U.K. (which do not have to comply with SOX) before and after SOX regulation became effective (from 1994 through 2006).¹⁹⁰ Post-SOX, the authors found that R&D spending for U.S. companies decreased while R&D spending increased for U.K. firms.¹⁹¹ The authors also found that, in contrast to U.K. firms, after SOX, U.S. firms in R&D intense industries were less likely to go public and may

186. FINANCIAL EXECUTIVES INTERNATIONAL, FEI SURVEY ON SARBANES-OXLEY SECTION 404 IMPLEMENTATION 8, 17 (2007).

187. Vicky Arnold et al., *The Unintended Consequences of Sarbanes-Oxley on Technology Innovation and Supply Chain Integration*, 4 J. EMERGING TECHNOLOGIES ACCT. 103, 117 (2007).

188. Another effect of this result may be to increase the cost of raising and borrowing capital for innovative public companies. See Butler & Ribstein, *supra* note 158, at 47 (arguing that SOX may reduce the flow of resources to firms engaging in "novel business practices" because such firms are "subject to increased liability risk under SOX").

189. RAMOS, *supra* note 178, at 48 (emphasis in original).

190. Leonce Bargerion et al., *Sarbanes-Oxley and Corporate Risk-Taking* (Mar. 6, 2008) (unpublished research paper, Katz Graduate School of Business, University of Pittsburgh), available at <http://ssrn.com/abstract=1104063>.

191. *Id.* at 15.

have decreased their risk-taking overall.¹⁹² Similarly, Cohen et al. found a significant post-SOX decline in R&D spending.¹⁹³ In addition, a study by Kang and Liu analyzed the impact of SOX on managerial risk-taking by using a “hurdle rate,” which is the minimum rate of return a manager would require before deciding to invest in a project.¹⁹⁴ The authors found a significant increase in the hurdle rate after the implementation of SOX and attributed the increase to managers becoming more cautious in their investment decisions.¹⁹⁵ This finding can also be explained by management’s attempt to avoid risky innovation activities that create a relatively greater risk of having to disclose an internal control weakness.

3. Organizational Flexibility

Compliance with SOX’s internal control duties may reduce organizational flexibility within corporations and thereby undermine innovation through strategic renewal or other attempts to adapt to change.¹⁹⁶ Findings from the SEC’s own Advisory Committee on Smaller Public Companies (Advisory Committee) support this conclusion. The Advisory Committee found that SOX undermined flexibility in small companies based on two observations. First, smaller companies are dynamic and constantly evolving, requiring frequent changes in production processes and job duties within the company.¹⁹⁷ This dynamism limits the ability of small companies to have well-documented production processes as required by SOX because “[f]lexibility and quick change often means that processes and [internal] controls change, and consequently that the documentation of those controls change” quickly as well.¹⁹⁸ Second, in smaller companies decision makers “wear multiple hats.”¹⁹⁹ Duties are not clearly segregated between undertaking business projects and financial reporting. As a result, top managers responsible for operations are also

192. *Id.* at 21-23.

193. Daniel A. Cohen et al., *The Sarbanes-Oxley Act of 2002: Implications for Compensation Contracts and Managerial Risk-Taking* 19, 22 (Nov. 2007) (unpublished research paper, on file with New York University Stern School of Business), *available at* <http://ssrn.com/abstract=568483>.

194. Qiang Kang & Qiao Liu, *The Sarbanes-Oxley Act and Managerial Risk Taking: A Structural Assessment 4* (March 1, 2007) (unpublished research paper, on file with the University of Miami), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=967950.

195. *Id.* at 15.

196. SOX’s independent director requirements may also undermine flexibility. *See infra* Part III.C.

197. ADVISORY COMM. ON SMALLER PUBLIC COMPANIES, U.S. SEC. & EXCH. COMM’N, FINAL REPORT 36 (2006).

198. *Id.* at 38.

199. *Id.* at 35.

involved in financial reporting.²⁰⁰ This combination of constantly changing control processes and management's involvement in documenting those changes, means that SOX's additional financial reporting duties divert operational assets to documenting and reporting changes in internal processes, thereby increasing the cost of such changes. Accordingly, the Advisory Committee concluded that SOX compliance causes dynamic companies that utilize top management in the financial reporting process to lose flexibility.²⁰¹

While the Advisory Committee limited its findings to small public companies, it is also the case that large, innovative companies are dynamic and therefore have management overlap in their operational and financial reporting functions. First, large innovative companies dynamically adapt to economic change by engaging in strategic renewal, changing their routines to integrate new products and adopting radical process innovations. The organizational changes arising from such activities implicate processes in several different parts of a company and may result in a large corporation changing previously established boundaries, controls, and production processes.²⁰²

Second, even though large corporations segregate operational and internal control functions, there is still significant overlap between top management's operational duties and those duties related to financial reporting. As the response by Apple described in the introduction to this Article illustrates, innovation may require operational managers to interact with those involved in financial reporting and accounting to properly exercise judgment about how an innovation should be undertaken. When organizational innovation or a substantial change in routines takes place, under Section 404 management must assess the impact of such changes on internal control and reporting risk.²⁰³ In addition, SOX requires management to disclose on a quarterly basis any material changes to internal control,²⁰⁴ which may include those that result from a large company undergoing substantial organizational change or strategic renewal. Furthermore, although SOX only mandates that the CEO and CFO certify the reliability of the internal controls, this requirement has the unintended consequence of requiring, on average, 22 additional executives

200. *Id.*

201. *Id.* at 36.

202. *See* Stieglitz & Heine, *supra* note 81, at 6 (noting that successfully implementing substantial and radical innovations may require cutting across the traditional organizational boundaries within the firm).

203. *See* RAMOS, *supra* note 178, at 49-50 (identifying new activities and restructurings as conditions likely to increase financial reporting risk under Section 404).

204. 17 C.F.R. § 240.13a-15(d) (2007); 17 C.F.R. § 240.15d-15(d) (2007); 17 C.F.R. § 229.308(c) (2007).

to sign internal control sub-certifications.²⁰⁵ A 2003 survey found that a majority of all financial professionals provide information ultimately used in their companies' publicly disclosed financial reports and that a third were required to sign section 302 sub-certifications.²⁰⁶ Although most of these financial professionals were already involved in financial reporting (e.g., treasurers), a significant portion of those found to be newly required to sign the sub-certifications were made up of operational directors, managers, and company vice presidents.²⁰⁷ It is also highly likely that subordinates to operational managers who are newly required to sign sub-certifications have a role in supporting the sub-certifying manager in the financial reporting process.

The dynamic nature of large innovative companies and management's involvement in financial reporting thus indicate that SOX reduces flexibility in large companies as it does in small public companies, through perhaps to a lesser extent. Accordingly, SOX likely increases the cost of strategic renewal, new product integration, and radical innovation by increasing the involvement of managers and other employees, who are otherwise tasked with running the company, in the financial reporting aspects of the business. Consistent with the foregoing is a case study of both small and medium-sized public companies finding that SOX compliance substantially reduced organizational flexibility due to concerns over having to report a material weakness in internal control.²⁰⁸ Furthermore, the studies finding internal control weaknesses more likely in companies undergoing rapid change²⁰⁹ are consistent with the proposition that SOX increases the cost of such change and, accordingly, may undermine the organizational and operational flexibility that facilitates innovation.

In sum, Section 404 increases the emphasis on financial versus strategic control, increases the cost of internal control assessments and reporting risks associated with innovation activities, and hampers the flexibility of even large public companies. The combined impact of these effects likely reduces the innovation capability of public companies that, but for SOX, would place a relatively greater emphasis on strategic control, undertake more activities facilitating innovation, and adapt to change through organizational innovation.

205. See Jo Lynne Koehn & Stephen C. DelVecchio, *Revisiting the Ripple Effects of the Sarbanes-Oxley Act*, CPA J. ONLINE, May 2006, <http://www.nysscpa.org/printversions/cpaj/2006/506/p32.htm> (reporting survey results showing that "22.5 executives, other than the CEO and CFO, will be required to submit subcertifications").

206. ASSOC. FOR FIN. PROFESSIONALS, *SUBCERTIFICATION: FINANCIAL PROFESSIONALS TAKING THE LEAD ON SARBANES-OXLEY 2* (2003).

207. *Id.* at 2-4.

208. Arnold et al., *supra* note 187, at 21-25.

209. See *supra* note 184 and accompanying text.

C. *More Independent and Larger Boards*

Prior to SOX, there was a trend towards smaller board size and greater independence among public companies, due in part to shareholder activism and public pressure.²¹⁰ Although SOX reversed the trend towards smaller boards, it increased the trend towards greater board independence.

Before SOX was passed, about two-thirds of the directors on public company boards were comprised of outside or independent directors,²¹¹ and seventy-five percent of all companies traded on the NYSE had a majority of independent directors.²¹² In 2000, 38.5 percent of 500 of the largest U.S.-listed public companies (i.e., those on the S&P 500 index) did not have fully independent audit committees as would later be mandated by SOX.²¹³ In 2001, 10.2 percent of all public companies did not have a majority of independent directors on their boards,²¹⁴ and neither did about eleven percent of the S&P 500 in 2000, as would later be required by the post-SOX NYSE and NASDAQ listing standards.²¹⁵ Furthermore, high-tech innovative companies were generally even less SOX compliant before the law was passed. In 2000, “new economy” companies had a lower ratio of independent directors and a slightly higher likelihood of having an insider-dominated board than their “old economy” counterparts.²¹⁶

Subsequent to SOX, both the percentage of independent directors and the percentage of public company boards with a majority of independent directors increased. Linck et al. found that from 2001 to 2004, the percentage of outside directors on boards increased from 66.3 to 70.8 percent, and that the percentage of boards with a majority of inside directors decreased from 10.2 to 4.6 percent.²¹⁷ Although these changes

210. Linck et al., *supra* note 165, at 23.

211. *Id.* at 23 (finding that 66.3 percent of directors were outsiders in 2001); Vidhi Chhaochharia & Yaniv Grinstein, *The Transformation of U.S. Corporate Boards: 1997-2003* 36, tbl.1 panel A (May 2004) (unpublished research paper, on file with Cornell University) (finding 64.04 percent of directors independent in 2000), available at <http://ssrn.com/abstract=556270>.

212. Clarke, *supra* note 136, at 73 n.2.

213. Chhaochharia & Grinstein, *supra* note 211, at 39 tbl.1, panel E by size (showing that in 2000 61.49 percent of S&P 500 companies had independent audit committees).

214. Linck et al., *supra* note 165, at 40, Fig. 1 panel B. Annual figures on file with author.

215. *Id.* at 36, tbl.1, panel A (finding that in 2000 81.88 percent of public companies had a majority of independent directors); *id.* at 36, tbl.1, panel B (finding that in 2000 89.79 percent of S&P 500 companies had a majority of independent directors). Another measure of large public companies comes to similar results, finding that in 2000 insider-dominated boards comprised 9 percent of companies having a median market capitalization of \$2.07 billion. Linck et al., *supra* note 94, at 316-17.

216. Chhaochharia & Grinstein, *supra* note 211, at 37 tbl.1 panel C.

217. Linck et al., *supra* note 165, at 40 Fig. 1 panels A-B (annual data on file with author); see also Chhaochharia & Grinstein, *supra* note 211, at 37, tbl.1, panel C (finding

were continuations of trends already in place prior to SOX, they also became more pronounced after SOX and likely reflect specific efforts to comply with the law.²¹⁸ To become SOX compliant, companies tended to add independent directors rather than replace insiders, which is reflected in public company board size increasing on average by 8.4 percent from 2001 to 2004 (which reversed the prior 12-year trend in decreasing board size).²¹⁹ In absolute terms, the increase in board size post-SOX was not substantial. Disaggregated by firm size, from 2001 to 2004 the average number of directors for large, medium, and small public companies increased from 9.3 to 10.3, 7.3 to 7.8, and 6.1 to 6.5, respectively.²²⁰

SOX and related independent director requirements therefore increased outside monitoring across all sizes of public companies, and was at least in part responsible for about ten percent making a fundamental switch from having a board with a majority of insiders to one with a majority of outsiders. Losing a majority of inside directors, or adding just one or two more independent directors, may significantly alter a company's decision making with respect to innovation. As suggested by empirical corporate governance research discussed below, innovation decisions are sensitive to board composition and board size. Independent and inside directors make different contributions to innovation, and the size of a board has an impact on the nature of its decision making.

Independent directors can facilitate innovation by aligning incentives of managers and shareholders, expanding the base of expertise from which management can draw, enhancing objectivity in director decision making, and encouraging managers to pursue corporate entrepreneurship.²²¹ However, because independent directors are not involved in day-to-day operations and likely have little or no stock ownership interest in the corporation, their capabilities and incentives to promote corporate entrepreneurship are limited.²²² By contrast, inside directors "are likely to be better informed about the sources of uncertainty and the potential returns stemming from innovative projects, and therefore they are more qualified to promote and assess such undertakings."²²³ Inside directors are in a better position to assess the merits of entrepreneurial projects because they are involved in the strategy process and have working knowledge of the

that new economy companies increased their independent board representation from 2000 to 2003 from 62.13 percent to 67.01 percent, a 7.8 percent increase).

218. Linck et al., *supra* note 165, at 27-29.

219. *Id.* at 24.

220. Linck et al., *supra* note 94, at 318 Fig. 1 panel C. Annual data on file with author.

221. Zahra, *supra* note 68, at 1717.

222. *Id.*

223. Munari & Sobrero, *supra* note 10, at 20; *see also* Zahra, *supra* note 68, at 1718 (noting that corporate entrepreneurship requires making informed judgments in the face of uncertainty).

corporation.²²⁴ Inside directors also have greater abilities and more incentives to increase communication and new product integration because they are involved in the day-to-day decision making of the company.²²⁵ Inside directors, because they generally possess greater knowledge of corporate operations and industry changes than outsiders, are likely in a better position to facilitate strategic renewal.²²⁶ Organizational flexibility is also generally facilitated when managers have substantial discretion to pursue projects without being micromanaged or second-guessed by third parties,²²⁷ a phenomenon that may increase the more independent and larger the board.

Accordingly, a board of directors which best facilitates innovation is comprised of some optimal balance of independent and inside directors. The relevant empirical evidence suggests that SOX, by increasing director independence, upset the optimal balance in certain innovative public companies.²²⁸

In a study of 1,526 publicly traded companies around the passage of SOX, Wintoki examined returns around important SOX-related events and found that the returns for companies with relatively higher monitoring costs, as determined by factors including R&D spending and growth opportunities, were abnormally low.²²⁹ This finding was attributed to such firms benefiting from having a significantly smaller proportion of independent directors and SOX's director mandates undermining the performance of such companies.²³⁰ Wintoki's findings provide indirect support for the proposition that SOX adversely impacted innovative firms for which relatively less independent board members is the optimal governance structure.

224. Zahra, *supra* note 68, at 1718; *see also* Munari & Sobrero, *supra* note 10, at 20 (“[I]nside directors, who actively participate in the operations of the company, are more and better informed and, consequently, should be more competent in assessing the strategic desirability of decisions and their potential consequences in the short or in the long run.”).

225. *See* Lacetera, *supra* note 100, at 38 (arguing that inside directors enhance innovation because they are directly and continuously involved with the company and also noting that “granting insiders strategic decision power is said by most studies to be a powerful incentive to share knowledge and competencies”).

226. Zahra, *supra* note 68, at 1718; *see also supra* Part II.B.

227. *See* Lacetera, *supra* note 100, at 36; Lassen et al., *supra* note 12, at 368; Teece et al., *supra* note 81, at 521 (noting that “decentralization and local autonomy” facilitate a firm’s ability to reconfigure in response to rapidly changing environments).

228. *See also* Linck et al., *supra* note 94, at 311 (noting prior research suggesting that “it is not optimal for firms with high information asymmetry to invite monitoring from independent directors because it is costly for the firms to transfer firm specific information to outsiders”).

229. M. Babajide Wintoki, *Corporate Boards and Firm Value: The Effects of the Sarbanes-Oxley Act and the 2002 Exchange Listing Requirements*, 13 J. CORP. FIN. 229, 243, 246-47 (2007).

230. *Id.* at 239, 243.

Furthermore, empirical studies largely find a positive correlation between the ratio of inside directors and innovation or related activity. In a 1996 survey-based study of 127 Fortune 500 corporations, Zahra found that having more outside directors was negatively correlated with innovation and strategic renewal.²³¹ Other studies have also observed a correlation between R&D spending and the presence of more insider directors. Baysinger et al. found that the percentage of inside directors on a board was positively correlated with R&D spending in a representative sample of Fortune 500 companies.²³²

More recent studies, after the movement toward board independence, also find a correlation between inside directors and factors which may be proxies for innovation, and attribute this finding to the proposition that firms efficiently adapt to higher monitoring costs by choosing more insiders to serve as directors.²³³ Based upon a 1992 to 2001 sample of 8,165 observations of public companies, Coles et al. found some evidence that R&D intensive companies have a greater representation of insiders on their boards, reflecting their dependence upon firm-specific knowledge possessed by inside directors.²³⁴ Using a sample of 6,931 public companies observed from 1990 to 2004, Linck et al. also found that public companies with higher monitoring costs had less independent boards.²³⁵ However, Link et al. found that higher R&D spending was generally correlated with a more independent board,²³⁶ as did Boone et al. based on their study of 1,019 firms during their first 10 years after going public.²³⁷ Yet, when isolating R&D intensive companies, Coles et al. found that firm value increases with a greater proportion of inside directors. They estimated that replacing one outside director with one insider on a ten-member board increased shareholder wealth by \$263 million in a sample of companies

231. Zahra, *supra* note 68, at 1725-32.

232. Barry D. Baysinger et al., *Effects of Board and Ownership Structure on Corporate R&D Strategy*, 34 ACAD. MGMT. J. 205, 207-09 (1991); see also Charles W.L. Hill & Scott A. Snell, *External Control, Corporate Strategy, and Firm Performance in Research-Intensive Industries*, 9 STRATEGIC MGMT. J. 577, 588 (1988) (finding a significant positive correlation between concentrated stock-ownership and R&D spending in 94 research-intensive Fortune 500 companies).

233. Boone et al., *supra* note 95, at 70-71 (describing the "monitoring hypothesis" in the context of reviewing empirical studies on board size, independence and firm characteristics).

234. Jeffrey L. Coles et al., *Boards: Does One Size Fit All?*, 87 J. FIN. ECON 329, 346 (2008) (noting that their three-stage least squares regression results "indicate that high-R&D firms have a higher insider fraction" on their boards).

235. Linck et al., *supra* note 94, at 320, 326.

236. *Id.*

237. See Boone et al., *supra* note 95, at 84-86, 90 (estimating that a "one-standard-deviation increase in the R&D measure predicts a 1.9 percentage point increase in the proportion of independent directors").

with a median annual sales of \$1.8 billion.²³⁸ These results on R&D spending and board composition support the proposition, developed in Part II.C, that a greater proportion of insiders facilitates valuable R&D in innovative companies whereas, in non-innovative companies, R&D spending may require greater outside monitoring to guard against opportunism and optimize its value to the company.²³⁹

In addition, based on a sample of 81 public companies that continually operated from 1935 to 2000, Lehn et al. found that independence was negatively correlated to growth opportunities where firms operated in markets with frequent technological change and rapidly changing prices.²⁴⁰ Lehn et al. interpreted their finding as demonstrating that companies like Genentech, which are heavily dependent upon knowledge utilization and flexibility, benefit from the increased presence of insiders.²⁴¹

Zahra found that stock ownership by outside directors contributes to entrepreneurship, which is consistent with the proposition that giving directors incentives to monitor and promote entrepreneurship will facilitate that activity.²⁴² However, Zahra noted that stock ownership by outside directors can only go so far to facilitate innovation because “the lack of access to information on corporate entrepreneurship may continue to frustrate even those outside directors who own relatively large blocks of corporate stock.”²⁴³ This finding underscores the importance of knowledge-utilization for successful innovation. While stock ownership by outside directors may increase incentives to be entrepreneurial, incentives are no substitute for the superior knowledge possessed by inside directors. By limiting the knowledge of the corporation’s operations, director independence may be a structural barrier to innovative activities and decision-making.

Finally, innovative firms benefit from relatively smaller boards. One reason for this is that the high cost of monitoring for innovation activities

238. Coles et al., *supra* note 234, at 344. Coles et al. found no relation between firm value and R&D spending for low-R&D companies. *Id.*

239. For the potential of R&D spending to give rise to managerial opportunism, see *supra* note 128 and accompanying text.

240. Kenneth Lehn et al., *Determinants of the Size and Structure of Corporate Boards: 1935-2000* 10-12, 18, 20-21, 25 (Sept. 2004) (unpublished research paper, on file with University of Pittsburgh, Katz Graduate School of Business), *available at* <http://www.cepr.org/meets/wkcn/5/5514/papers/ZHAO.pdf>.

241. *Id.* at 26.

242. Zahra, *supra* note 68, at 1728; *see also* Munari & Sobrero, *supra* note 10, at 21 (stating that Zahra’s study indicates that insiders control is more conducive to innovation). In a study of Asian firms, Hung and Mondejar also found that a preference for innovative risk-taking was positively correlated with share ownership by directors. Humphry Hung & Reuben Mondejar, *Corporate Directors and Entrepreneurial Innovation: An Empirical Study*, 14 J. ENTREPRENEURSHIP 117, 125 (2005).

243. Zahra, *supra* note 68, at 1729.

rises in proportion to board size.²⁴⁴ Management scholars find that larger groups suffer from communication and coordination problems.²⁴⁵ These deficiencies may be particularly acute for innovation activities that rely upon communication of knowledge and coordination of interdependent activities. Supporting this proposition are studies by Boone et al. and Cheng which found that board size is negatively correlated with R&D expenditures across a broad range of public companies,²⁴⁶ and a study by Linck et al. finding that public companies with high monitoring and advising costs—characteristics typical of innovative companies—have smaller boards.²⁴⁷ Importantly, no studies have found that R&D intensity, high monitoring costs, or any other proxy for innovation correlates with larger boards.

In sum, the empirical corporate governance literature suggests that a significant number of innovative public companies maximize their value to shareholders with relatively less independent and smaller boards. Innovation activities have higher monitoring costs, and the studies finding that firms with higher monitoring costs tend to have more inside directors and smaller boards are consistent with the proposition that innovation is facilitated by proximate, inside monitoring. To the extent SOX increased the independence and size of innovative companies' boards beyond their optimal levels, SOX may have undermined the ability and propensity of such companies to innovate.

D. Increased Director and Manager Turnover

Maintaining a commitment to long-term investment projects suggests that there is an optimal level of decision maker tenure and turnover. On the one hand, long-term commitments will likely be undermined if strategic decision makers leave the corporation before projects are completed. Successful innovation requires the development of firm-specific knowledge and skills over a substantial period of time; this implies that innovation may be lower in corporations where either short tenure or excessive turnover (or possibly both) undermine and interfere with the long-term commitments and planning required for innovation. Because successful innovation often requires quick execution,²⁴⁸ innovation is less likely to succeed where high turnover leads a company to delay implementing an

244. Linck et al., *supra* note 94, at 311.

245. Linck et al., *supra* note 165, at 24.

246. Boone et al., *supra* note 95, at 69 (estimating that “a one-standard-deviation increase in either R&D intensity or return variance predicts a decrease in board size by 0.25 members”); Shijun Cheng, *Board Size and the Variability of Corporate Performance*, 87 J. FIN. ECON. 157, 163 (2008).

247. Linck et al., *supra* note 94, at 320, 326.

248. See Andrew et al., *supra* note 31, at 17-19.

innovation project until a new manager is integrated into the company. On the other hand, directors and managers insulated from the market for corporate control, or otherwise able to secure excessive tenure, may be less reluctant to innovate, thus resulting in organizational inertia.²⁴⁹

Empirical research demonstrates that the post-SOX increase in burdens and liabilities has substantially increased turnover among key corporate personnel. Post-SOX, there has been a significant increase in turnover among CEOs, CFOs, and directors (although turnover rates may be decreasing and not all increases are attributable to SOX).²⁵⁰ Although few empirical studies measure the relationship between director or management turnover and innovation, the research generally suggests that the higher, SOX-induced turnover rates are not optimal for innovation. A study of post-IPO high-tech medical instrument corporations by Yasemin Kor provides mixed but suggestive results. Kor found that R&D spending decreased as top manager's tenure increased, indicating that newer managers had incentives to take higher risks than the more established, senior managers.²⁵¹ This may indicate that SOX increases innovation insofar as it has the effect of bringing in new managers willing to take on more R&D spending or other risky activities. However, Kor also found that R&D spending was correlated to shared, team-specific, experience by managers, suggesting that risky R&D investments flourish in conditions where there is shared understanding and trust.²⁵² Thus, innovation may be undermined by bringing in new managers because shared understanding and trust take time to establish. Kor also found an association between lower R&D spending and more outsiders on boards and longer

249. See, e.g., Shelley S. Gordon et al., *Convergence Versus Strategic Reorientation: The Antecedents of Fast-Paced Organizational Change*, 26 J. MGMT. 911, 915, 918 (2000).

250. See RUSSELL REYNOLDS ASSOCIATES, FINANCIAL OFFICERS' TURNOVER: 2007 STUDY 1 (noting that after SOX, CFO, controller and treasurer "turnover has increased dramatically"); Dan R. Dalton & Catherine M. Dalton, *Sarbanes—Oxley and the Guidelines of the Listing Exchanges: What Have We Wrought?*, 50 BUS. HORIZONS 93, 95-96 (2007) (discussing turnover and instability with boards of directors and CEOs); Telis Demos, *Doesn't Anyone Want to Be a CFO Anymore?*, CNNMONEY.COM, Jan. 22, 2007, http://money.cnn.com/2007/01/22/magazines/fortune/CFO_nopain.fortune/index.htm (reporting that public "[c]ompanies with a market cap of at least \$1 billion changed CFOs three times more often in 2005 than in 2002" and that "among public companies of all sizes, CFO exits increased from 1,867 in 2005 to 2,302 in 2006."); see also DELOITTE, HOW CFOs CAN THRIVE UNDER THE PRESSURE (2008) (recognizing the increased demands placed on CFOs); Linck et al., *supra* note 165, at 29-30 (discussing the effects of the Sarbanes-Oxley Act on directors and boards and the associated risks and workloads).

251. Yasemin Y. Kor, *Direct and Interaction Effects of Top Management Team and Board Compositions on R&D Investment Strategy*, 27 STRATEGIC MGMT. J. 1081, 1089, 1093 (2006) (exploring the varying compositions of board outsiders and top management teams and how those different combinations effect the intensity of R&D investment).

252. *Id.* at 1089, 1093.

management tenure.²⁵³ Kor interpreted this finding as evidence that outsider boards bring gamesmanship and conflict into a corporation, which has the effect of reducing R&D spending.²⁵⁴ This finding also supports the proposition that corporations that rely on proximate inside monitors are better equipped to steer investment projects toward risky innovation projects than corporations that rely on outside monitors.

In addition, some studies have reviewed the impact of tenure or turnover on changes in strategic reorientation, which may be a proxy for innovation insofar as new products, methods, or forms of organization result from changes in strategy. A study by Wiersema and Bantel found that longer tenure by top management, including the CEO, was correlated with more changes in strategy,²⁵⁵ and Gordon et al. found that companies with higher turnover of top managers (excluding the CEO) were less likely to modify strategy.²⁵⁶ These findings suggest that top managers must first gain substantial knowledge of the company before implementing strategic changes and that the post-SOX increase in turnover undermines this process to the detriment of innovation. However, Gordon et al. also found that companies that changed CEOs were more likely to alter their strategic orientation.²⁵⁷ This may show that SOX increased changes in strategic reorientation, which facilitated innovation. However, to the extent SOX changed strategic orientation, it is more likely that SOX caused companies to hire new CEOs with a strategy that promoted a relatively greater focus on risk management and legal compliance as opposed to innovation. This latter interpretation is suggested in the next subsection.

E. Changing Roles of Directors and Officers

Directors and top-level managers are responsible for engaging in innovation-supporting activities like strategic entrepreneurship. This includes strategic monitoring, where directors evaluate management and top-level managers evaluate subordinates. Generally, the allocation of company time to established projects or routines occurs at the expense of time that could have been devoted to innovation.²⁵⁸ Moreover, individuals possess limited attention spans that they can devote to innovation.²⁵⁹

253. *Id.* at 1091, 1094.

254. *Id.* at 1087-88.

255. Margarethe F. Wiersema & Karen A. Bantel, *Top Management Team Demography and Corporate Strategic Change*, 35 ACAD. MGMT. J. 91, 113 (1992).

256. *See* Gordon et al., *supra* note 249, at 933.

257. *See id.*

258. *See* Stieglitz & Heine, *supra* note 81, at 7 (suggesting that there is “a fundamental trade-off between the creation and use of assets . . . because the creation of new assets gets in the way of an efficient use of existing resources”).

259. *See* Gifford, *supra* note 59, at 125-26.

Evidence suggests that the new burdens SOX places on decision makers distract from innovation-supporting activities like strategic entrepreneurship and strategic monitoring. Instead, directors and top-level management focus a greater amount of their attention on current activities that relate to regulatory compliance.

At the executive level, one survey finds that CFOs have shifted their attention away from strategy and increased their focus on regulatory compliance and short-term risk management.²⁶⁰ In addition, a survey by Financial Executives International found that large public companies, such as those with greater than \$700 million in revenue, spent an average of 9,700 hours on internal control compliance, not including the hours spent by internal information technology and internal audit staff professionals.²⁶¹ It is likely that managers responsible for formulating and executing company strategy and other innovation-facilitating activities accounted for a portion of those 9,700 hours, thereby allocating less time to strategy and innovation activities. Furthermore, requiring management to sign and be responsible for financial statement sub-certifications has likely shifted management's time and attention to financial reporting and away from innovation activities.

At the director level, an April 2006 survey of directors and managers by Ernst & Young ("E&Y") found that "[n]ew regulation—in many cases imposing detailed public disclosure with criminal penalties for directors who sign off on false or misleading information—is *focusing the attention of the board on monitoring and managing risk as never before.*"²⁶² The E&Y survey found that boards have allocated more resources to address risk management issues, including establishing a "growing number of risk committees."²⁶³ Regulatory and compliance risk was identified as the primary cause of increases in overall risk and as the highest priority for risk management.²⁶⁴ The survey also found that the increase in risk "has called for more effort and attention from board members."²⁶⁵ Independent board members revealed that post-SOX their role shifted from providing strategic advice to management to establishing and maintaining risk management processes.²⁶⁶ The E&Y survey also noted the potential tension between

260. RUSSELL REYNOLDS ASSOCIATES *supra* note 250, at 1-3 ("Since the introduction of Sarbanes-Oxley . . . the role of the CFO has changed from a strategic role to one that carries much more risk and liability than in previous years. . . . As the Sarbanes-Oxley dust is settling, a new breed of CFO is emerging: a *regulatory* expert, with the ability to extend knowledge into accounting, strategy and communications.").

261. FIN. EXECUTIVES INT'L, *supra* note 186, at 6, 14.

262. ERNST & YOUNG, *supra* note 176, at 1 (emphasis added).

263. *Id.*

264. *Id.* at 5, 11, 18.

265. *Id.* at 9.

266. *Id.* at 10.

directors focusing on risk mitigation and top management's responsibility for risk-taking.²⁶⁷ Overall, the workload of individual directors has substantially increased post-SOX, with audit and nominating/corporate governance committees meeting more regularly.²⁶⁸ Annual directors' fees have increased every year since the passage of SOX, likely reflecting the increased workload resulting from change in the law, in addition to increased director liability.²⁶⁹

To the extent it has any impact, the increase in workload and heightened focus on compliance, especially in the context of increased turnover rates, likely distracts from and undermines strategic decision-making. There are no studies directly measuring the impact on innovation when managers and directors decrease the time they allocate to long-term strategy and other innovation-facilitating proximate monitoring. Indirect evidence may be found, however, in studies finding that innovation activities increase when concentrated stockholdings increase the incentives or ability of shareholders to engage in more proximate monitoring. These studies are consistent with the more general proposition that innovation decreases when there is less strategic decision making; a decrease which may be attributable to decision makers having either less incentives, abilities, or time to spend on innovation.

A 1991 study of 176 Fortune 500 companies by Baysinger et al. found a positive relationship between concentrated ownership among institutional stockholders and R&D spending, but not in conditions where concentrated ownership was maintained by individuals.²⁷⁰ This result was attributed to institutional investors having greater incentives to take an active and long-term strategic role in management as a result of not being able to sell large shareholdings without a substantial loss.²⁷¹ Francis and Smith found evidence that corporations with dispersed shareholders innovate less than those with concentrated stock ownership among insiders, and also less than corporations with a large block of shares owned by an outsider.²⁷² They attribute this to the fact that the latter two types of ownership structures

267. *Id.* at 11.

268. Linck et al., *supra* note 165, at 15-16; *see also* Adam Plore, *Wanted: Board Members*, PORTFOLIO.COM, July 3, 2007, at 4 (reporting directors' work hours have increased to 206 from 100 or 150 prior to SOX); Koehn & DelVicchio, *supra* note 205, at 1 (reporting that one study of public companies found that, on average, audit committees met five times annually in 2002 and seven times annually in 2003 and other studies finding a meeting of nine times annually in 2005).

269. *See* THOMAS E. HARTMAN & FOLEY & LARDNER LLP, *THE COST OF BEING PUBLIC IN THE ERA OF SARBANES-OXLEY* 9 (2006) (charting and tabling the amount of fees that were paid to auditors between 2001 and 2005); Linck et al., *supra* note 165, at 10-15 (discussing changes in director's pay).

270. Baysinger et al. *supra* note 232, at 209.

271. *Id.* at 212-13.

272. Francis & Smith, *supra* note 113, at 408.

enable monitoring of managers for innovation and reduce costs created by myopia.²⁷³ Using a sample of 81 firms from 1979-81, Hill and Snell found evidence that managerial block ownership overcomes, at least to some degree, management's inherent aversion to long-term, risky R&D projects.²⁷⁴ More recently, Lee looked at all publicly traded U.S. firms listed in 1995 and found that, for firms above a threshold of \$100 million in R&D investments, an increase in stock ownership concentration among individuals and institutions was significantly correlated with an increase in patents granted.²⁷⁵ Thus, to the extent SOX distracts decision makers from engaging in proximate monitoring or other innovation-supporting activities, it may have the same impact as reducing the incentive or ability of shareholders to engage in proximate monitoring, which empirical studies of stock concentration suggest causes a reduction in innovation.

IV. CONCLUSION

The foregoing analysis demonstrates that corporate governance structures have a powerful impact on innovation by public corporations. SOX increased the importance of financial reporting and control, increased board independence and size, increased director and manager turnover, and heightened companies' focus on regulatory compliance. The cumulative impact of these changes likely undermines the ability of a substantial portion of public companies to utilize knowledge assets, adapt to change, engage in long-term risky projects, and otherwise undertake innovation activities. Accordingly, SOX likely inhibits growth in the value of shares held by investors in innovative companies that would otherwise adopt more decentralization and place a greater emphasis on strategic control if not subject to SOX. Consumers and the overall economy are also worse off to the extent that SOX causes public companies to operate below their innovative potential.

Public companies complying with SOX will undoubtedly continue to innovate and grow, and likely even at a record pace in absolute terms. However, the foregone benefits due to SOX reducing the innovative potential of public companies are likely to increase, because the importance of innovation seems to be increasing. Due to intensifying global competition and the decreasing costs of mass communication, rapid

273. *Id.* at 385.

274. Charles W.L. Hill & Scott A. Snell, *Effects of Ownership Structure & Control on Corporate Productivity*, 32 ACAD. MGMT. J. 25, 31, 42 (1989); see also Hill & Snell, *supra* note 232, at 586-87 (finding a significant positive correlation between concentrated stock-ownership by managers and R&D spending in ninety-four research-intensive Fortune 500 companies).

275. Lee, *supra* note 162, at 45.

economic change is ubiquitous.²⁷⁶ The U.S. economy's increasing reliance on knowledge assets increases the potential value of innovation because innovation is itself a product of learning and utilizing knowledge. Product life-cycles are also becoming shorter, thereby increasing the importance of new product development.²⁷⁷ In response to the increasing importance of innovation, managers at companies worldwide consider innovation a top strategic priority, and plan on sustaining or even increasing the high levels of assets allocated to innovation activities.²⁷⁸ Accordingly, SOX likely imposes a large, hidden, and growing cost in the form of foregone benefits that could accrue from innovation.

The findings in this Article support a fundamental easing of the burdens of SOX on innovative firms. The most straightforward reform in this regard is to make voluntary for all public companies those provisions of SOX that increase outside monitoring and the emphasis on financial control. Other provisions of SOX, such as increased criminal liability, likely have no tangible impact on innovation and therefore are not required to be voluntary in order to facilitate innovation. This approach to reform is consistent with the research findings that corporate governance structures tend to be optimally chosen based upon firm-specific characteristics. Firms not choosing to comply with SOX would have that choice reflected in their financial statements, and would likely draw increased attention from analysts and shareholder activists for managerial opportunism. Firms electing to comply with SOX because they benefit from more outside monitoring and financial control would also send a signal to financial markets. By making the provisions of SOX that interfere with the innovation process voluntary, innovative companies that benefit from adopting more proximate monitoring than permitted under the current law could thus operate to their full potential.

Critics of making the provisions of SOX that increase objective monitoring and financial control voluntary would be correct to state that such a reform may increase the potential for managerial opportunism. The

276. Kuratko & Morris, *supra* note 28, at 22 (“Today, the business environment is literally defined in terms of *change*” such that “the pace and magnitude of change is greater than ever before.”) (emphasis in original); MORRONI, *supra* note 19, at 78-79 (noting that “for many firms innovation has become . . . increasingly important” because of an increase in uncertainty in the economic environment); *see also* Lawson & Samson, *supra* note 18, at 378-380 (“The emergence of the knowledge economy, intense global competition and considerable technological advance has seen innovation become increasingly central to competitiveness Today’s organisations face an additional challenge—the requirement to innovate, not just occasionally but often, quickly and with a solid success rate.”).

277. Richard A. Bettis & Michael A. Hitt, *The New Competitive Landscape*, 16 STRATEGIC MGMT. J. 7, 8 (1995) (recognizing the implications of technological changes on strategic management).

278. Andrew et al., *supra* note 31, at 7-8.

analysis and evidence presented here, however, suggest that investors and consumers are not better off when companies suffering from relatively higher myopia costs are required to adopt structures designed to inhibit opportunism. While making certain provisions of SOX voluntary may lead to more opportunism in innovative companies, the benefits from innovation would likely more than offset such costs and result in net benefit for investors, consumers, and the economy.