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Discovering the Role of the Firm: The Separation Criterion and Corporate Law

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DISCOVERING THE ROLE OF THE FIRM:
THE SEPARATION CRITERION AND CORPORATE LAW

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INTRODUCTION

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Abstract

Professor Daniel F. Spulber presents a theory of the firm based on the ability to separate the objectives of the firm from those of its owners. He introduces a separation criterion which defines a firm as a transaction institution such that the consumption objectives of the institution's owners can be separated from the objectives of the institution itself. The separation criterion provides a bright line distinction between firms and other types of transaction institutions. Firms under this criterion include profit-maximizing sole proprietorships, corporations, and limited-liability partnerships. Institutions that are not classified as firms include contracts, clubs, workers' cooperatives, buyers' cooperatives, merchants associations, basic partnerships, government enterprises, and government sponsored enterprises. The separation theory of the firm yields insights into corporate law that extend and complement the standard contractarian approach. The separation theory of the firm places emphasis on shareholder property rights and corporate governance.

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INTRODUCTION

Defining the role of the firm lies at the heart of many of the most important contemporary public policy debates. These debates can go adrift if they are not anchored by a generally accepted definition of what is a firm. Diverse views of the firm affect antitrust enforcement and regulation of firms throughout the economy, including energy, transportation, telecommunications, and information technology. Determining the properties of firms is central to debates over the desirability of government privatization or nationalization, including the government takeover of Freddie Mac and Fannie Mae.¹ Discerning the rights and responsibilities of corporations is fundamental to understanding corporate regulation by the Securities and Exchange Commission.² Corporate governance issues arise in statutes such as the Sarbanes-Oxley Act passed in response to recurrent crises of corporate governance, including the demise of Enron and WorldCom, then the largest bankruptcy in United States history. Posing challenges to corporate law, the subprime-mortgage crisis set new records in corporate bankruptcies, including the demise of the global financial services firm Lehman Brothers. The purpose of this article is to propose an economic theory of the firm that serves as an effective guide for public policy.

The economic contributions of firms are manifest. Firms are responsible for most of the economy's gross domestic product (GDP), employment, innovation, international trade, and economic growth. The U.S. Census counts over 20 million firms, 5 million of which have paid employees, with a total employment of over 100 million people.³ There are millions more firms in other developed economies and a growing number of firms in developing countries.⁴ There are over 64,000

¹ Freddie Mac is the nickname of the Federal Home Mortgage Corporation and Fannie Mae is the nickname of The Federal National Mortgage Association.

² See MacAvoy, P. W., and I. M. Millstein, 2004, [The Recurrent Crisis in Corporate Governance](#), New York: Palgrave Macmillan.

³ The 1997 U.S. Census lists 5,295,152 firms with paid employees, having a combined sales revenue of \$17.9 trillion and counts 20,821,935 firms overall, with sales receipts of over \$18.5 trillion, <http://www.census.gov/epcd/mwb97/us/us.html>

⁴ On cross-country studies of firms in the developed economics, see

multinational firms that operate across national boundaries.⁵

But what is a firm? The economic definitions of the firm are fragmented and inconsistent and provide limited guidance for law and public policy.⁶ There is no consensus regarding what is the economic

Scarpetta, S., P. Hemmings, T. Tressel, and J. Woo, 2002, "The Role of Policy and Institutions for Productivity and Firm Dynamics, Evidence From Micro and Industry Data," Working Paper No. 329, April, Organization for Economic Co-operation and Development; and Bartelsman, E. J., and M. Doms, 2000, "Understanding Productivity: Lessons from Longitudinal Microdata," Journal of Economic Literature, 38, September, pp. 569-594. On firms in developing economies, see Tybout, J. R., 2000, "Manufacturing Firms in Developing Countries: How Well Do They Do, and Why?" Journal of Economic Literature, 38, March, pp. 11-44,

⁵ United Nations Conference on Trade and Development (2003). For additional discussion, see Gabel, M., and H. Bruner, 2003, Global Inc.: An Atlas of the Multinational Corporation, New York: The New Press.

⁶ The main economic definitions of the firm can be briefly summarized as follows. The main (neoclassical) economic concept of the firm is that of a producer that owns and operates a production technology, see for example Arrow, K. J., and F. H. Hahn, 1971, General Competitive Analysis, San Francisco: Holden-Day. The industrial organization conception of the firm also views the firm as a production technology, often characterized by economies of scale, but also characterizes the firm as a strategic player. The most important precursor of our analysis is that of Ronald Coase who emphasizes that the boundaries of the firm are determined by the transaction costs of using the market in comparison with the firm's internal costs. See Coase, R. H., 1937, "The Nature of the Firm," Economica, 4, pp. 386-405; Coase, R. H., 1988, "The Nature of the Firm: Origin, Meaning, Influence," Journal of Law, Economics & Organization, 4, reprinted in Oliver E. Williamson and Sidney G. Winter, eds., 1991, The Nature of the Firm: Origin, Meaning, Influence, Oxford: Oxford University Press, pp. 34-74; Coase, R. H., 1994, "The Institutional Structure of Production," The 1991 Alfred Nobel Memorial Prize Lecture in Economic Sciences, in Ronald H. Coase, Essays on Economics and Economists, Chicago: University of Chicago Press, pp. 3-14. Oliver Williamson builds on Coase's contrast between markets and the firm's internal allocation, but narrows the specification of transaction costs to the concept of "opportunism," commonly referred to as

role of the firm. This article proposes a general definition that can be applied to identify the firm's role in the economy.⁷ The article examines how separation provides the firm with capabilities that enhance the efficiency of transactions. The article presents the *separation theory of the firm* and explores its implications for corporate law.

The theory of the firm presented here provides a means of evaluating and analyzing the variety of existing economic analyses of the firm. The proposed formal definition of the firm should prove valuable in

contractual hold-up. See Williamson, O. E., 1975, Markets and Hierarchies, New York: Free Press; Williamson, O. E., 1985, The Economic Institutions of Capitalism, New York: Free Press. Oliver Hart and John Moore, building on Williamson, offer a property rights theory of the firm, in which the purpose of the firm is to combine assets by ownership so as to improve coordination, see Hart, O. D., and J. Moore, 1990, "Property Rights and the Nature of the Firm," Journal of Political Economy, 98, December, pp. 1119-1158. Frank Knight, Armen Alchian and Harold Demsetz, and Bengt Holmström emphasize the importance of the firm in providing contractual incentives, monitoring, and coordination for its employees primarily to alleviate moral hazard, see Knight, F. H., 1971, [Houghton, Mifflin, 1921], Risk, Uncertainty and Profit, Chicago: University of Chicago Press; Alchian, A., and H. Demsetz, 1972, "Production, Information Costs, and Economic Organization," American Economic Review, 62, 5, December, pp. 777-795; and Holmström, B., 1999, "The Firm as a Subeconomy," Journal of Law, Economics and Organization, 15, April, pp. 74-102. Michael Jensen and Jensen and Meckling provide a theory of the firm as a "nexus of contracts" that serves to allocate risk efficiently, see Jensen, M., 2000, A Theory of the Firm, Cambridge: Harvard University Press; and Jensen, M., and W. Meckling, 1976, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," Journal of Financial Economics, 3, pp. 305-360. These more specialized views of the firm are consistent with the general definition presented here. The differences are explored in a later section of the article.

⁷ This discussion draws upon the analyses presented in Daniel F. Spulber, 2009, The Theory of the Firm: Microeconomics With Endogenous Entrepreneurs, Firms, Markets, and Organizations, Cambridge: Cambridge University Press, forthcoming, and Daniel F. Spulber, 1999, Market Microstructure: Intermediaries and the Theory of the Firm, New York: Cambridge University Press.

understanding the how the firm functions within the context of social, legal, and political constraints.⁸ The firm as an institution is related to social conventions such as language, norms, rules, customs, or kinship.⁹ The firm is defined by legal concepts such as those regulating property, contracts, business transactions, organizations, financial markets, and corporate governance. The firm operates within a political framework as well being subject to taxation, regulation, and ownership restrictions. The definition of the firm must be sufficiently precise that it distinguishes the firm from other types of institutions.

The key step in defining the firm is to perform a conceptual experiment that considers the economy without firms. In the absence of firms, individuals can engage in direct exchange through a variety of transactions, including barter, spot transactions with fiat money, and contracts. In addition, through direct exchange, individuals can form many types of organizations including clubs, consumers' cooperatives, workers' cooperatives, nonprofits, merchants' associations, and basic partnerships. Direct exchange between consumers is the benchmark for

⁸ The word “firm” derives from the Latin word “firmare” referring to a signature that confirmed an agreement by designating the name of the business. The institution of the firm has properties that extend beyond its formation and identity.

⁹ According to John R. Commons, 1931, “Institutional Economics,” American Economic Review, 21, pp. 648-657, “Transactions are the means, under operation of law and custom, of acquiring and alienating legal control of commodities, or legal control of the labor and management that will produce and deliver or exchange the commodities and services, forward to the ultimate consumers.” Karl Polanyi argued that “man’s economy, as a rule, is submerged in his social relationships,” through reciprocity, redistribution and the household, see Polanyi, K., 2001 [1944], The Great Transformation: The Political and Economic Origins of Our Time, Boston: Beacon Press. Ian R. Macneil argues that “Contract without the common needs and tastes created by society is inconceivable; contract between totally isolated, utility-maximizing individuals is not contract, but war; contract without language is impossible; and contract without social structure and stability is—quite literally—rationally unthinkable. The fundamental root, the base, of contract is society.” See Macneil, I. R., 1980, The New Social Contract: An Inquiry into Modern Contractual Relations, New Haven: Yale University Press.

evaluating the economic contribution of the firm. The firm plays an economic role if it can improve the efficiency of transactions in comparison to direct exchange.

To provide a meaningful definition of the firm, it is necessary to establish a bright line distinction between the firm and direct exchange. To identify the difference between the firm and direct exchange, I introduce the separation criterion. An institution satisfies the separation criterion if the objectives of the institution can be distinguished from those of its owners. The critical difference between firms and direct exchange is the separation of the firm's objectives from those of its consumer-owners. This provides the basis for a formal definition: A firm is a transaction institution whose objectives can be separated from those of its owners. Most types of consumer organizations have objectives that cannot be separated from those of their owners so that they are not firms. Separation is the basis for the firm's contribution to the economy because it allows the firm to improve economic efficiency in comparison with direct exchange between consumers. Separation helps firms to choose efficient employment levels and to provide incentives for its employees. Owners prefer that the firm choose prices to maximize profits. Intermediated exchange through firms improves upon direct exchange as a result of the separation of objectives. Separation allows the firm to serve as a profit-maximizing intermediary in economic transactions.

The separation theory of the firm yields insights into corporate law that extend and complement the standard contractarian approach. The separation theory of the firm places emphasis on shareholder property rights and corporate governance. With separation, ownership of firms represents financial assets that facilitate divestiture, acquisition, and mergers. The ability to trade ownership of firms as financial assets provides liquidity to investors and allows for market valuation of the firm, thus helping firms to raise capital. Separation is the basis of the market for corporate control, which provides incentives for managers.

II. EVOLUTION OF THE FIRM

The firm is a relatively recent institution, taking recognizable form within the last two hundred years. Farmers, artisans, and merchants from the earliest times to the eighteenth century operated enterprises that

are precursors to the contemporary firm.¹⁰ Merchant houses established enterprises to finance and manage ventures necessary to conduct trade.¹¹ Other institutions that presage the contemporary firm include families, feudal estates, religious organizations, merchant associations, armies, and government bureaucracies.¹²

What distinguishes traditional farmers, artisans, and merchants from firms is that their enterprises tended to be integrated with the owners' personal affairs. There was minimal if any separation between the owners' commercial activities and their consumption activities. Most merchants operated as family businesses, so that the merchant family was closely tied to the firm: "the business being in the family and the

¹⁰ The linguistic connection between merchants, markets and commerce is long established. The words "merchant" and "market" have the same Latin origins. Merchant comes from the word mercari, which means to trade, and market comes from mercatus which is the past participle of mercari. The word mercari itself derives from the Latin word merx, meaning wares, merchandise, or goods for trade. The word "commerce" also derives from commercium, which is bringing together goods for trade (Webster's New World Dictionary of the American Language, 2nd College Edition).

¹¹ Karl Moore and David Lewis, 1999, Birth of the Multinational, Copenhagen: Copenhagen Business School Press, examine the forerunners of the international business firm in four ancient empires that together span two millennia.

¹² See Y. Ben-Porath, , 1980, "The F-connection: Families, Friends, and Firms in the Organization of Exchange," Population and Development Review, v. 6, March, pp. 1-30 on families; Ekelund, R. B., Jr., and R. Burton, 1996, Sacred Trust: The Medieval Church as an Economic Firm, New York: Oxford University Press, on religion organizations; Avner Greif, 1989, "Reputation and Coalitions in Medieval Trade: Evidence on the Maghribi Traders," Journal of Economic History, 49, December, pp. 857-882, and Avner Greif, 1993, "Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition," American Economic Review, 83, pp. 525-548 on merchant associations. On armies, see Weber, M. 1968, Economy and Society, translated and edited by Roth, G., and C. Wittich, New York: Bedminster Press, at 982; and on government bureaucracies, see Schumpeter, J. A, 1997 [1934], The Theory of Economic Development, New Brunswick, NJ: Transaction Publishers, at 163-164.

family being in the business.”¹³ The activities of merchants became increasingly sophisticated reaching a high level during the commercial revolution in Europe during the first half of the middle ages.¹⁴ Merchants’ capabilities continued to develop from the fourteenth century to the end of the eighteenth century. Alfred D. Chandler observes that “In the 1790s American businessmen still relied entirely on commercial practices and procedures invented and perfected centuries earlier by British, Dutch and Italian merchants.”¹⁵

The contemporary firm takes a more recognizable shape during the nineteenth century. The industrial revolution led to the creation of large manufacturing and distribution enterprises starting in the late eighteenth century.¹⁶ Chandler points out that those companies seeking to benefit from technological change invested not only in production facilities, but also in distribution and in management.¹⁷ At the same time, companies were established that engaged in large-scale retail and wholesale distribution. Merchants began to specialize in one or two types of goods, “concentrating more and more on a single function: retailing, wholesaling, importing, or exporting” over the fifty years after the 1790s.¹⁸ According to Chandler, “In the 1850s and 1860s the modern commodity dealer who purchased directly from the farmer and sold directly to the processor took over the marketing and distribution of agricultural products.¹⁹ In the same years, the full-line, full-service wholesaler began to market most standardized consumer goods. In the 1870s and 1880s the modern mass retailer – the department store, the

¹³ Reynolds, R. L., 1952, “Origins of Modern Business Enterprise: Medieval Italy,” Journal of Economic History, 12, pp. 350-365.

¹⁴ Joseph Gies and Frances Gies refer to the development of merchants and finance in Europe between 1000 and 1500 as “the commercial revolution,” see Gies, J., and F. Gies, 1972, Merchants and Moneymen: The Commercial Revolution, 1000-1500, New York: Crowell. The term also appears in Polanyi, supra note 9.

¹⁵ See Chandler, A. D., 1977, The Visible Hand: The Managerial Revolution in American Business, Cambridge, MA: Harvard University Press.

¹⁶ Chandler, 1977, supra note 15.

¹⁷ See Chandler, A. D., 1990, Scale and Scope: the Dynamics of Industrial Capitalism, Cambridge, MA: Harvard University Press.

¹⁸ Chandler, 1977, supra note 15, at 15.

¹⁹ Chandler, 1977, supra note 15, at 209.

mail order house, and the chain store – started to make inroads on the wholesaler’s markets.” These mass marketing enterprises employed extensive administrative coordination, reduced the number of total transactions, increased the speed and regularity of the flow of goods, and took advantage of the railroads, the telegraph, the steamship, and improved postal services.²⁰

Chandler finds that the “managers of large American railroads during the 1850s and 1860s invented nearly all of the basic techniques of modern accounting,” including financial, capital, and cost accounting.²¹ After 1900, with the growth of mass production, comes the development of modern factory cost accounting.²² Advanced management techniques developed at large diversified firms such as General Electric, Du Pont, and General Motors were widely adopted during the 1920s, particularly the multidivisional organization structure, and accounting, budgeting, and forecasting methods.²³

Legal developments accompanied changes in the technology and functions of enterprises. Margaret M. Blair points out that in 1800 there were only 335 chartered business corporations in the U.S. of which most were chartered after 1790.²⁴ However, by 1890, the U.S. led the world with almost 50,000 chartered business corporations.²⁵ Unincorporated joint stock companies, which evolved out of partnership law, died out, while businesses increasingly switched to the corporate form. Blair

²⁰ Chandler, 1977, *supra* note 15.

²¹ Chandler, 1977, *supra* note 15, at 109.

²² Chandler, 1977, *supra* note 15, at 278.

²³ *See* Chandler, 1977, *supra* note 15, at 464; and Drucker, P. F., 1946, Concept of the Corporation, New York: John Day Co. [revised edition 1972].

²⁴ *See* Blair, M. M., 2003, “Why Markets Chose the Corporate Form: Entity Status and the Separation of Asset Ownership from Control,” Georgetown University Law Center, Business, Economics and Regulatory Policy Working Paper No. 429300. *See also* Davis, J. S., 1965 [1917], Essays in the Earlier History of American Corporations, New York: Russell & Russell.

²⁵ Blair, 2003, *supra* note 24, citing Votaw, D., 1965, Modern Corporations, Englewood Cliffs, NJ: Prentice-Hall, and Wright, R., 2002, The Wealth of Nations Rediscovered: Integration and Expansion in American Financial Markets, 1780-1850, Cambridge: Cambridge University Press.

argues that unincorporated joint stock companies could be easily broken up by the partners or their heirs seeking to remove their capital from the firm.²⁶ Corporations became the dominant legal form because courts recognized them as “separate legal entities with potentially unlimited life,” whose assets would be protected from owners who could then sell their shares to others based on the market value of the company.²⁷

Hillman observes that “there seems to be little practical distinction between corporations and partnerships when either form of firm is populated by a large number of shareholders or partners, as the case may be.”²⁸ Ribstein points out that partnerships already had developed continuity and other entity features by the early nineteenth century so that the ability to lock in capital need not help to distinguish between organizational forms.²⁹ Although there are many large corporations, partnerships with hundreds of owners, or even thousands of owners such major accounting firms are rare. They tend to concentrate in service industries, particularly law, accounting, management consulting, and medicine. Such large partnerships are characterized by centralized management and an organization hierarchy in which the status and authority of individual partners varies considerably.³⁰

The common law viewed a partnership as the aggregate of its

²⁶ Blair, 2003, *supra* note 24.

²⁷ Blair, 2003, *supra* note 24.

²⁸ *See* Hillman, R. W., 2005, “The Bargain in the Firm: Partnership Law, Corporate Law, and Private Ordering within Closely-Held Business Associations,” Research Paper No. 37, April, School of Law, University of California, Davis.

²⁹ *See* Ribstein, L. E., 2006, “Should History Lock In Lock-In?” Illinois Law and Economics Working Papers Series, Working Paper No. LE06-005, February, pp. 1-19. Ribstein notes that in contrast to corporations, partnerships let members transfer economic interests in the firm but not necessarily control rights, *see* Ribstein, L. E., 2004, “Why Corporations?” Berkeley Business Law Journal, 2, pp. 183-232. Ribstein (2004) also states that any member of the partnership has the power to dissolve a partnership or to seek to be bought out by the partnership. Ribstein (2006) argues that liquidation does not explain the switch to corporations because partners can prevent liquidation through the partnership agreement and the partners can contract for buyout rights.

³⁰ *See* Hillman, 2005, *supra* note 28.

members.³¹ In a classic treatise, Justice Nathaniel Lindley wrote that “merchants and lawyers have different notions respecting the nature of a firm,”

“Commercial men and accountants are apt to look upon a firm in the light in which lawyers look upon a corporation, *i.e.*, as a body distinct from the members composing it, and having rights and obligations distinct from those of its members.”³²

For lawyers, in contrast, “Partners are called collectively a firm.”³³ To end the “hopeless confusion in law and practice,”³⁴ the Uniform Partnership Act (UPA) of 1914 attempted to take a middle position, treating a partnership as a collective for some purposes and as a separate entity for other purposes.³⁵ The Revised Uniform Partnership Act of 1997 moves toward the corporate law view of the partnership as an institution whose objectives are distinct from those of its owners stating that “A partnership is an entity.”³⁶

II. THE DEFINITION OF THE FIRM AND THE SEPARATION CRITERION

This section introduces a general theory of the firm. The definition is built on a specific test for determining whether or not an economic institution is a firm, which I refer to as the separation criterion. An institution satisfies the separation criterion when its objectives are separate from the consumption objectives of its owners. By definition, the firm’s business objectives differ from the consumption objectives of its owners.

³¹ Lindley also is quoted in Mechem, F. R., 1896, Elements of the Law of Partnership, Chicago: Callaghan and Company, at 5.

³² See Lindley, N. L., 1888, A Treatise on the Law of Partnership, Fifth Edition, Boston: C. H. Edison.

³³ Justice Lindley, 1888, *supra* note 32, at 110.

³⁴ See Lewis, W. D., 1916, “The Uniform Partnership Act,” Yale Law Journal, 24, May, pp. 617-641, p. 162) quoted in Rosin, G. S., 1989, “The Entity-Aggregate Dispute: Conceptualism and Functionalism in Partnership Law,” Arkansas Law Review, 42, pp. 395-466, at 399.

³⁵ Rosin, 1989, approvingly calls this a functional approach and argues for rejecting the “legal-person fiction” as well as the concept of the aggregate.

³⁶ RUPA § 201. See Hillman, 2005, *supra* note 28, for further discussion.

The separation criterion provides a bright line distinction between firms and consumer organizations. The objectives of many types of organizations, such as clubs, groups of contracting individuals, buyers' cooperatives, workers' cooperatives, nonprofits, merchants' associations, and basic partnerships, cannot be distinguished from those of their owners. For example, the objective of a club is to maximize the consumption benefits of its members.

The firm will be economically viable only if it offers efficiencies that are greater than those offered by consumer organizations or contracts between individuals. The firm separates contracts from direct interpersonal relationships by serving as an intermediary, such as a broker or a merchant or by establishing markets and organizations. Since the firm is defined by the separation criterion, it must be the case that separation provides the firm with enhanced transaction capabilities. The purpose of this section is to show how separation provides the firm with "super powers" that are unavailable either to consumer organizations or to contracts between individual consumers.

II.A Conditions for Separation

The separation criterion substantially extends the discussion of separation due to Irving Fisher.³⁷ Fisher showed that the neoclassical firm's investment decisions could be separated from the owners' consumption and saving objectives. Fisher's classic result takes as a given the neoclassical definition of the firm – as a production technology. The separation criterion presented in this article substantially extends this approach by establishing a standard for evaluating *any* type of economic institution. The separation criterion presented here asks whether or not the objectives of an economic institution can be separated from the consumption objectives of its owners.

Fisher's separation theorem is squarely in the neoclassical tradition because it requires price-taking behavior by both consumer-owners and firms. The Fisher separation theorem assumes that there are no transaction costs and that there exists a complete set of competitive

³⁷ See Fisher, I., 1906, *The Nature of Capital and Income*, New York: Macmillan; Fisher, I., 1907, *Rate of Interest: Its Nature, Determination and Relation to Economic Phenomena*, New York: Macmillan; and Fisher, I., 1930, *The Theory of Interest: As Determined by Impatience to Spend Income and Opportunity to Invest It*, New York: Macmillan.

markets.³⁸ The Fisher separation theorem shows that the firm's optimal investment decisions are independent of the preferences of its owners and independent of how the investment is financed. The firm's owners are only affected by the firm's decisions through their wealth. They carry out their consumption and saving decisions through product markets and financial markets. The Fisher Separation Theorem is essential to the foundations of neoclassical microeconomics and finance.

The ability of an institution to separate its objectives from those of its owners is closely connected to whether there are gains from trade. When individual consumers cannot achieve gains from trade due to transaction costs, they will engage in autarky production, essentially managing production for their consumption benefits. When there are little or no transaction costs and markets exist, consumers achieve gains from trade by decoupling production and consumption decisions. The neoclassical separation theorem is based two sources of gains from trade. The consumer obtains part of the gains from trade by adjusting consumption and buying and selling goods at given prices. The firm obtains part of the gains from trade by adjusting production and by buying and selling goods at given prices, generating profit that adds to the income of its consumer-owners.

Market opportunities to buy and sell goods imply that groups of consumers do not need to rely on operating production to achieve their consumption objectives. Firms can choose the best mix products based on their technology and consumer demands, and consumers can choose the best mix of goods to buy based on their preferences and endowments. Market opportunities to share risk imply that consumers do not need to operate production to allocate resources under uncertainty. Market opportunities for contracts imply that consumers do not need to operate production to transfer resources over time.

Consumer organizations internalize transactions and maximize

³⁸ Price-taking behavior is not a necessary condition for separation of objectives. Spulber (2009, *supra* note 7) shows that the separation of objectives still holds when firms engage in monopolistic competition and choose prices. Because of product differentiation, the effect of the firm's profit on owner's income is substantial while the expenditure effect of the firm's price is negligible. The discussion also generalizes the Fisher separation theorem to price setting firms and shows that with product differentiation, the owners' consumption-saving decisions can be separated from the firm's investment decisions.

the consumption benefits of their members. Gains from trade with others outside the group of members generate returns from separation. The ability to sell memberships, for example, generates gains from trade. Consumers do not need to operate a club or cooperative to obtain the benefits from economies of scale or from local public goods.

Property rights are fundamental to the firm because they allow gains from trade. Property rights allow individuals to trade goods and services and to realize the returns on investments. Consumers need not rely on autarky production or internalization of exchange within consumer organizations. When a club's members cannot sell memberships, the club maximizes average consumption benefits for its members. When the club's "insiders" can sell memberships, the club changes its objectives. The insiders view the club as an asset and their consumption objectives become separate from the club's objectives. As a result, the inside members unanimously prefer that the club maximize profits. With a market for membership shares, the club becomes a firm.

Well-defined property rights are essential to the establishment of firms. Property rights provide owners with rights to the firm's returns and rights to control the firm. The firm's owners cannot manage the firm without exercising control rights. The firm's owners will not devote effort to operating and monitoring the firm unless they obtain returns to their efforts. Entrepreneurs will not devote resources to establishing firms unless they will become its owners, and receive returns and rights of control. The firm's has a greater ability to secure capital when it can provide investors with collateral based on the firm as an asset.

Efficient markets require property rights to be complete, exclusive and transferable. Consumer organizations may fail to satisfy any or all of these requirements. Consumer organizations such as clubs, cooperatives, nonprofits, and associations are owned in common by their members, so that shares are not owned exclusively. In basic partnerships, common ownership poses problems of free riding and moral hazard. Collective ownership in basic partnerships restricts the ability of members to transfer ownership shares. Transferable ownership shares allow members to realize gains from trade through separation of objectives, giving them incentives to establish a firm.

Henry Hansmann and Reinier Kraakman ask "what, if any, essential role does organizational law play in modern society."³⁹ They

³⁹ See Hansmann, H., and R. Kraakman, 2000, "The Essential Role of Organizational Law," The Yale Law Journal, 110, 3, December, pp. 387-

further ask “do the various legal entities provided by organizational law permit the creation of relationships that could not practicably be formed by contract alone?” Hansmann and Kraakman argue that the main role of organizational law is asset partitioning.⁴⁰ Not only are investors’ assets protected from claims of the corporation by limited liability, the converse is also the case. The assets of the corporation, and the personal assets of its owners and managers, are protected from claims by investors. Effectively, organizational law establishes a system of property rights for the corporation, rather than just rules for contracts. Hansmann and Kraakman emphasize that “the separation between the firm’s bonding assets and the personal assets of the firm’s owners and managers – is the core defining characteristic of a legal entity, and establishing this separation is the principal role that organizational law plays in the organization of enterprise.”⁴¹

II.B Institutions That Are Not Firms

The separation criterion provides a clear distinction between firms and other types of institutions. Among consumer organizations that do not satisfy the separation criterion are clubs, workers’ cooperatives, buyers cooperatives, merchants’ associations, some types of basic partnerships, some forms of nonprofits, and government enterprises.

Sole proprietorships that intermingle the consumption objectives of their owners with the activities of the enterprise generally do not satisfy the separation criterion. For example, traditional family farms that primarily serve the consumption benefits of their owners are not firms. Contracts and other transactions between individuals generally do not satisfy the separation criterion since they reflect the diverse objectives of the parties to the transaction.

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⁴⁰ See Hansmann and Kraakman, 2000, *supra* note 39, and Hansmann, H., and R. Kraakman, 2000, “Organization Law as Asset Partitioning,” *European Economic Review*, 44, pp. 807-817.

⁴¹ Hansmann and Kraakman, 2000, *supra* note 39. Also, Hansmann et al examine the development of asset separation shielding the firm in ancient Rome, medieval Italy, early modern England, and the contemporary United States. See Hansmann, H., R. Kraakman, and R. Squire, 2006, “Law and the Rise of the Firm,” *European Corporate Governance Institute Working Paper Series in Law*, No. 57/2006, pp. 1-63.

Many types of institutions do not satisfy the separation criterion. For example, a club seeks to maximize the net benefits that its members receive from jointly consuming the services of the club's facilities. Maximizing average benefits yields a different outcome than maximizing total benefits. Basic partnerships are not firms since the partnership's objective is to maximize the individual returns to each of its partners, rather than total returns. For example, in an equal sharing partnership, partners consider the marginal effects of their efforts on their share of total benefits rather than the marginal effects of their efforts on total benefits. Nonprofits are not firms if their objectives cannot be separated from those of their owners, which may include managers, employees, and members. For example, arts organizations provide consumption goods for their members. Some nonprofit institutions can achieve separation of by following their founders' intent.⁴²

Government enterprises are not firms since the separation criterion is not satisfied. The objectives of government enterprises are those of the government that owns them. These objectives include increasing employment, subsidizing consumption, subsidizing production, bearing risk, and wealth transfers. Enterprises that are established by the government or nationalized are owned by the government. Such enterprises promote public policy objectives rather than independent objectives since no separation is possible. Since such objectives typically conflict with profit maximization, government enterprises may incur significant losses in pursuit of public objectives.

Government-sponsored enterprises (GSEs), such as Fannie Mae and Freddie Mac, also are not firms. These institutions lack a separation of objectives due to various government controls. Although these enterprises were privatized, their congressional charter maintained elements of public ownership. Unlike a private corporation, the government exercised rights of control. In addition, the government provided a line of credit through the Treasury, the president could appoint five members of its board of directors; and the company's debt

⁴² Such an approach is recommended by Carl Schramm, who points out that the trustees of the foundation should follow the "founder's express or imputed intent" free of constituencies and stakeholders, while seeking to "advance human welfare within the context of democratic capitalism" (at 412-413), *see* Carl J. Schramm, "Law Outside the Market: The Social Utility of the Private Foundation," Harvard Journal of Law and Public Policy, vol. 30, no. 2, Fall, 2006, pp. 355-415.

could serve as collateral for government deposits in private banks.⁴³ The companies incurred significant losses and were nationalized by the federal government, converting them from GSEs to public enterprises.⁴⁴

II.C Separation implies that the Firm's Objective is Profit Maximization

Separation implies that the firm's objective is profit maximization. With separation, the firm's owners are affected by the firm's decisions only through the impact of the firm's profit on their income. The firm's owners make consumption decisions by choosing the most-preferred consumption bundle given their income. As a result, the firm's owners unanimously prefer that the firm maximize profits.

Profit maximization by the firm yields decisions that differ from those of consumer organizations. Firms and consumer organizations generally choose different prices, outputs, product quality, investment levels, employment levels, and technologies. The differences in the choices made by firms and by consumer organizations determine the economic impact of firms.

The differences in the decisions of a firm from those of consumer organizations results in greater economic efficiency under some conditions. Generally, consumer organizations are concerned with maximizing average benefits, which often results inefficient outcomes. Firms consider the marginal benefits of their decisions, which often results in greater economic efficiency. Economic profits provide incentives for firms to carry out their activities, including price setting. Increased competition between firms limits their market power and can enhance economic efficiency. Firms play an economic role when the combination of profit maximization and competition leads to outcomes that are more efficient than consumer organizations.

As a consequence of the separation of objects, the firm is an additional player in the economy. Essentially, a firm adds degrees of

⁴³ See Peter J. Wallison and Charles W. Calomiris, "The Last Trillion-Dollar Commitment: The Destruction of Fannie Mae and Freddie Mac," Financial Services Outlook, AEI Online, September 30, 2008.

⁴⁴ After accounting scandals in 2003 and 2004, Fannie Mae and Freddie Mac increased their pursuit of public policy objectives. As a consequence, the companies incurred substantial losses on more than \$1 trillion of subprime and Alt-A investments between 2005 and 2007, see Wallison and Calomiris, *id.*

freedom to a set of economic transactions. If there are n consumers, adding a firm means that there are $n + 1$ economic actors, and potentially n additional economic relationships between the consumers and the firm itself. This fundamentally changes the set of feasible transactions. The firm is an independent decision maker as a result of separation from its owners, employees, and trading partners. Because firms maximize profits they are players with different strategic objectives than consumers.

The separation criterion implies that the firm is a transferable asset. Suppose that property rights to firms are well defined, so that owners of firms potentially can transfer these rights. The separation of between the owners' consumption objectives and the objectives of the firm imply that owners do not need to own control the firm to achieve their consumption objectives. The firm's owners can realize the value of the firm by transferring ownership to others thus realizing the value of the firm by selling it. Separation implies that the owners of the firm are only affected by the firm through the income that the firm generates. As a result, the firm is a transferable financial asset.

Firms allow for a system of complete, exclusive and transferable property rights. Ownership of firms is complete and exclusive. Firms are divisible assets whose shares can be transferred. The transferability of shares of firms has a number of important benefits. The owners of the firm can sell their ownership to other consumers or to firms, providing liquidity to inventors and to entrepreneurs. Transfers of ownership determine the market value of the firm. Firms engage in many transactions with investors, customers, suppliers and others. The returns to this set of transactions can be capitalized in the form of ownership shares of the corporation. The firm provides a mechanism for converting the value of future transactions into a tradable asset.

II.D Separation of Objectives Allows the Separation of Ownership and Control

With separation of objectives, the firm's owners can delegate decision making to managers, thus separating ownership and control. Consumer organizations such as cooperatives and basic partnerships do not separate ownership and control. More complex organizations, such as closely-held firms, corporations and some types of partnerships, allow

the separation of ownership and control.⁴⁵ The advantages of separating ownership and control include delegation of authority to specialized managers. In corporations, owners of the firm can delegate monitoring of the firm's managers to a board of trustees.

The separation of ownership and control allows individuals to buy and sell shares of firms. Prices in securities markets reflect investor information about the anticipated performance of the firm. The owner of the firm obtains the residual returns from the firm's earnings and exercises residual control over the firm's operations. Individuals can build portfolios of securities allowing them to obtain the benefits of diversification of investments.⁴⁶ The separation of ownership and control thus enhances the ability of the firm to raise financial capital in comparison with consumer organizations. Financing investment is one of the most important functions of the firm.

Another major benefit from the separation of ownership and control is the development of a market for corporate control. The importance of the market for corporate control originally was identified by Henry Manne.⁴⁷ Corporate managers operate under the supervision of the firm's shareholders, its board of directors, and investors. The firm's managers must act in shareholders' interests or they will be replaced either by the firm's current or future shareholders.

⁴⁵ Ribstein examines more complex partnership forms, which he refers to as "uncorporations." He considers variations on the partnership form such as master limited partnerships, real estate investment trusts, private equity firms, hedge funds and venture capital funds. More complex partnerships with general governance structures are firms because they allow the separation of objectives. See Larry Ribstein, 2007, "Rise of the Uncorporation," University of Illinois Law & Economics Research Paper No. LE07-026, July; Larry Ribstein, 2007, "The Uncorporation and Corporate Indeterminacy," presented at the Illinois Program in Business Law and Policy, October 19, 2007, forthcoming Illinois Law Review; and Larry Ribstein, 2009, The Rise of the Uncorporation, Oxford University Press, forthcoming.

⁴⁶ See Henry Manne, 1967, "Our Two Corporation Systems, Law & Economics," Vol. 53, Virginia Law Review, 259-284.

⁴⁷ Manne, H. G., 1965, "Mergers and the Market for Corporate Control," The Journal of Political Economy, 73, 2, April, pp. 110-120; and Manne, H. G., 1966, "Insider Trading and the Stock Market," New York: Free Press.

The separation of ownership and control allows for market valuation of the firm, providing information to managers, investors, and the firm's owners. Market for corporate ownership makes it easier to combine firms through mergers and acquisitions. This allows the firms' owners to obtain gains from consolidating different firms. Markets for corporate ownership make it easier to reorganize firms by divestiture, allowing the firm's owners to benefit from assigning the firm's assets and capabilities to different tasks.

Some important benefits of separation of ownership and control are those associated with agency. Delegation to managers provides benefits from specialization and the division of labor. The managers of the firm are specialists in strategy, administration, functional areas such as accounting, marketing, finance, operations, information technology, and R&D. The managers of the firm provide knowledge and expertise, so that the firm is not limited by the capabilities of its owners. The managers of the firm devote their time and effort to management so that the firm is not limited by the opportunity costs of its owners' time and effort.

Delegation of authority to a manager replaces multiple contracts among owners with two types of contracts. The firm's owners contract with the firm through ownership shares and in turn, the firm contracts with the manager. The firm provides transaction cost advantages when ownership shares combined with a contract between the firm and the manager are less costly than multiple contracts among members of a consumer organization. The manager unifies the control of the firm in comparison with multiple conflicting managers of a consumer cooperative or a basic partnership. The contract between the firm and the manager is a relational contract that specifies in general terms the manager's duties without the need for continual renegotiation that might occur within a basic partnership.

Separation of ownership and control provides incentives for management that differ from consumer organizations such as basic partnerships. The firm provides the manager with incentives for performance. This relationship is subject to problems of moral hazard since the manager's effort may not be observable. The relationship is subject to problems of adverse selection since the manager may have information that is hidden from the firm's owners, such as the manager's ability. Consumer organizations experience moral hazard in the form of free riding and adverse selection due to asymmetric information. The relative effects of these costs determine whether there are advantages to

the separation of ownership and control. The firm performs better if the transaction costs associated with agency are less than the transaction costs associated with free riding. The unity of control offered by delegation to a manager can offer benefits by replacing costly group decision making.

II.E Returns to Entrepreneurs

The separation of objectives has profound implications the establishment of firms. The resulting separation of ownership and control helps to specify the returns to entrepreneurs. After the firm is established, the entrepreneur becomes an owner of the firm. The entrepreneur realizes a return to entrepreneurship by obtaining the firm's profits once the firm is established. If there is a market for firms, the entrepreneur realizes a return by selling the firm. The return to entrepreneurship is the owner's share of the value of the firm once it is established.

As an illustration, consider an entrepreneur who identifies an opportunity to bring an invention to market by purchasing an invention from an inventor and then selling the invention to several producers. One way to obtain the returns from this idea would be for the entrepreneur to carry out all of necessary transactions with the inventor and the producers. The entrepreneur would invest time and effort in completing the necessary transactions. The entrepreneur would realize returns through contracts with the inventor and producers. Alternatively, the entrepreneur could establish a firm to carry out the necessary transactions. After establishing the firm, the entrepreneur would receive a share of the profits of the firm or the entrepreneur could sell the firm to investors. The value of the firm would reflect the expected return to the entrepreneur's idea. Forming a firm gives the entrepreneur the benefit of liquidity by allowing the entrepreneur to realize the value of his idea through operating the firm or through selling ownership of the firm. The potential entrepreneur chooses between contracts and establishing a firm based on the relative efficiency of the transactions.

II.F The Firm Intermediates Transactions

Firms address transaction costs both through markets and organizations. The major role that firms play in the contemporary economy suggests that firms possess substantial transaction cost

advantages over direct exchange.⁴⁸ The scope of the firm is the combination of the firm's market making and organizational activities. The role of the firm in improving transactional efficiency suggests an "intermediation hypothesis," which states that increases in consumer transaction costs relative to those of the firm, lead to growth of the scope of the firm. The "intermediation hypothesis" is complementary with a the "internalization hypothesis," otherwise known as the "make-or-buy" choice, which suggests that firms address some types of transaction costs by vertical integration. This determines how the firm divides its scope between it market making activities and organizational activities.

The "intermediation hypothesis" examines the economy's reliance on firms as intermediaries. The hypothesis suggests that as a result of transaction costs, the extent of the market explains the establishment of firms to replace consumer organizations and direct exchange. The general theory of the firm yields useful insights that can be tested empirically using contemporary and historical data. The diversity of firms in the contemporary economy provides substantial information for studying the activities of firms.

The separation of objectives between the firm and its consumer-owners supports the firm's role as an intermediary in economic transactions. Through multilateral transactions, the firm overcomes time constraints faced by individuals. By creating market mechanisms and organizational structures, firms are able to manage many transactions simultaneously.

Consumers cannot be in two places at once. This limits their ability to engage in multiple transactions. Consumers have a limited amount of time to allocate between labor, leisure and transaction activities. It is reasonable to suppose that consumers can only engage in one transaction at a time, and since transactions take time, a consumer is limited in the number of transactions per unit of time. Firms overcome such time limitations through organizations with multiple members, so

⁴⁸ See Spulber, 1999, *supra* note 7, and Spulber, D. F., 1998, The Market Makers: How Leading Companies Create and Win Markets, New York: McGraw Hill/ Business Week Books, on the role of firms in establishing and operating markets and in the design of market microstructure. Spulber points out that firms provide markets with mechanisms of spontaneous order in addition to prices, including marketing, sales, media and other types of mass communication, see Spulber, D. F., 2007, Global Competitive Strategy, Cambridge: Cambridge University Press.

that firms can engage in multiple transactions simultaneously.⁴⁹ The firm faces practically no limits on the number of transactions per unit of time. The application of information technology further extends the ability of the firm to enter into many transactions.

By transacting with many buyers and sellers, the firm creates a network that gives its customers access to many suppliers and its suppliers access to many customers. The firm as intermediary is thus at the center of hub-and-spoke network.⁵⁰ Jensen and Meckling view of the firm as a “nexus of contracts” reflects the efficiency of centralized contracting.⁵¹ Buyers and sellers transact with the firm in contrast to making every possible connection between individual buyers and sellers. Efficiency is improved since the number of connections is significantly lower. Efficiency is further enhanced if the firm adds additional matchmaking activities that reduce search costs for members of the network.

The firm has advantages over individual consumers by serving as a contracting hub. Many different types of transactions can be connected. The firm contracts with customers, suppliers, partners, investors, and employees. This simplifies the content of each transaction. For example, a customer buying a gallon of milk at a supermarket need not consider all of the underlying transactions that were necessary to establish, finance staff, and provision the store. The customer further benefits from one-stop shopping, filling a shopping basket with one transaction at the store, without the need to shop at many specialized stores for each item in the basket.

Firms can also perform clearing-house activities that consolidate transactions. In a clearing house, members make multiple trades and settle with the clearing house only the net payments. Clearing reduces

⁴⁹ For example, the Federal Reserve Bank’s FedWire in 2003 handled 123 million transactions with an aggregate value of \$447 trillion, see Lyon, J. M., 2004, “Payments Evolution or Revolution? Views from the Federal Reserve,” The Region, June, pp. 6-9, 38-41.

⁵⁰ Such hub-and-spoke economies are well-known in marketing, see Alderson, W., 1954, “Factors Governing the Development of Marketing Channels,” in R. M. Clewett, ed., Marketing Channels for Manufactured Products, Homewood, IL: Irwin. See also Townsend, R. M., 1978, “Intermediation with Costly Bilateral Exchange,” Review of Economic Studies, 55 (3), pp. 417-425.

⁵¹ See Jensen and Meckling, 1976, supra note 6.

the number of necessary settlements to at most one transaction per member. Banks benefit from processing payments between its own accounts, known as “on us” transactions, rather than payments between banks which double the number of transactions, referred to as “transit transactions.”⁵²

The firm’s market transactions and organizational transactions are voluntary. Firms apply market mechanisms and organizational incentives rather than command and control. The firm’s customers, suppliers, and employees make decisions on the basis of their preferences, endowments, and information. The voluntary response of individuals to incentives such as prices, wages, and contracts generates “spontaneous order” in the sense of Friedrich Hayek.⁵³ Market transactions are the result of voluntary agreements between buyers and sellers who receive gains from trade. Organizational transactions also are the result of voluntary agreements between the firm and its employees, who each receive gains from trade. Alchian and Demsetz emphasize the voluntary nature of employment.⁵⁴ They point out that “managing, directing, or assigning workers to various tasks” is just a form of continual contract renegotiation within organizations.

II.G The Firm Has Longevity

The separation of the firm’s objectives from those of its owners provides the firm with an important feature. Although the firm’s owners have finite lifetimes, the firm can overcome. By living longer than individual consumers, firms can create many kinds of transactions that consumers cannot. By operating in multiple periods, firms can transfer value over time. Firms can develop transactions that connect consumers who wish to transact in different time periods. Firms can transfer value and goods over time through contracts with consumers and suppliers in multiple periods. Shares of the firm are tradable assets that provide a store of value to investors.

Because firms can live longer than consumers, they can invest in developing long-term reputations. In practice, the firm’s name is a brand

⁵² See Shaffer, S., 1997, “Network Diseconomies and Optimal Structure,” July, Working Paper No. 97-19, Federal Reserve Bank of Philadelphia.

⁵³ Hayek, F. A., 1977, “The Creative Powers of a Free Civilization,” in F. Morley, ed., Essays on Individuality, Indianapolis: The Liberty Fund.

⁵⁴ Alchian and Demsetz, 1972, *supra* note 6.

that stands for the firm's reputation for product quality, expertise, trustworthiness, or possibly lack thereof. Such reputation effects can reduce potential problems of moral hazard or adverse selection. The long-term returns to reputation provide incentives for behavior by firms that allow transactions not necessarily available to consumers.

The longevity of firms permits investments in activities such as research and development that take a long time to bear fruit. Because firms can live longer than their employees, firms can receive returns to efforts that have a long-term payoff. Firms can reward employees for efforts whose returns may exceed the employees tenure or even their lifetime.

Firms also can outlive their owners. This valuable aspect of longevity is reflected in the corporate form that allows owners to withdraw their capital by selling their ownership shares to others without interfering in the life of the company. Entrepreneurs earn returns from establishing a firm that outlives them. Such a transaction might be difficult to achieve through direct exchange between shorter-lived consumers.

II.H The Firm Offers Identity and Anonymity

Macneil observes that practically all contracts are "relational" in that their characteristics include significant duration, close personal relations as in employment, social reputation and norms, anticipation of future cooperative behavior, and a view that the relationship will evolve over time rather than being fully specified at the outset.⁵⁵

The firm changes the nature of contracts by serving as an intermediary. Firms offer both identity and anonymity to the individuals with whom it contracts. The firm has its own name and identity that is known to its customers, suppliers, partners, and investors. The firm's identity provides returns to building a brand name and reputation, as already noted. In turn, the firm may keep track of the identity of its trading partners as a means of gathering market information.

At the same time, by serving as an intermediary, the firm often confers some amount of anonymity on its transaction partners. Although the firm and its trading partners know each others' identities, the firm allows its trading partners to retain their anonymity with each other.

⁵⁵ See Macneil, 1980, *supra* note 9, and Macneil, I. R., 1974, "The Many Futures of Contracts," Southern California Law Review, 47, pp. 691-816.

Customers need not know each others' identities or those of the firm's suppliers or investors. Transactions become somewhat removed from their social context in comparison with direct exchange.

Two consumers participating in direct exchange often are aware of each other's individual characteristics, they may know each other socially or they may have traded together before. Such social connections may have advantages; the two consumers may have built up trust for example. However, such social connections may have disadvantages as well. The transaction may involve time-consuming conversations and social rituals that increase the costs of bargaining. The terms of trade may reflect social obligations between the parties that may prove more advantageous for some. In contrast, firms standardize transactions in terms of prices and the characteristics of goods and services. They confer anonymity on their customers and other trading partners. A customer can purchase a product at a store with a minimum of interaction beyond the transaction. This allows firms to develop markets for goods and services in which transactions are more convenient for customers and suppliers.

Firms also offer some anonymity in employment. There may be advantages working with family members or members of a social group, as in the case of merchant associations. However, there are high transaction costs involved in establishing and maintaining a team or partnership. Negotiations would be affected by family or social relationships. By standardizing employment relationships, firms allow potential employees to develop standard skills that can be offered to different firms. Firms standardize wages and job descriptions for potential employees. Firms organize labor markets by making employment relationship more convenient for employees.

II.I The Firm Realizes Economies from Specialization and Division of Labor

The many different types of firms are specialists in particular types of transactions. There great variety of economic transactions helps to explains the many types of firms in the economy. A buyer forms a contract with a seller to obtain a future service. A factory owner engages workers and coordinates their productive efforts to manufacture a good. A contractor engages skilled labor to complete a project. A principal hires an agent, often to represent the principal in a further transaction with a third party. An investor provides financing for a productive activity. Practically any economic activity from exchange to

manufacturing can be fully described in terms of transactions.

The specialization and division of labor in society that Adam Smith emphasized is enhanced by adding firms to the population of consumers. Entrepreneurs can establish a firm to undertake a highly specific task. Firms can specialize in particular types of transactions in a manner that may not be feasible for consumers. A consumer may purchase a wide variety of goods. A consumer may have diverse interests, combining labor and leisure pursuits. Consumer-owners can invest in a specialized firm, while holding a diverse portfolio of other investments.

The specialist firm improves transactions by developing expertise in completing a particular type of exchange. Firms employ and train personnel with the necessary skills and develop knowledge within the organization needed to conduct a particular type of business. Firms develop business routines to carry out repetitive tasks, such as production assembly lines or check out stands at retail stores. Chandler identifies organizational capabilities in management strategy and in functional areas such as innovation, marketing and purchasing.⁵⁶ As a result of specialization, firms can get better at communicating, learning, and making decisions.

The specialist firm takes advantage of economies of scale and scope in transaction technology. Firms have fixed costs of transactions, that is, the costs do not depend on the volume of transactions, such as information-processing equipment.⁵⁷ Firms can also take advantage of

⁵⁶ Chandler, 1990, *supra* note 17.

⁵⁷ Banks have economies of scale in handling accounts and processing transactions. See empirical studies by Sealey, C., Jr., and J. T. Lindley, 1977, "Inputs, Outputs, and a Theory of Production and Cost at Depository Financial Institutions," Journal of Finance, 32, pp. 1251-1266; Gilligan, T., M. Smirlock, and W. Marshall, 1984, "Scale and Scope Economies in the Multi-Product Banking Firm," Journal of Monetary Economics, 13, May, pp. 393-405; and Ferrier, G. D., and C. A. K. Lovell, 1990, "Measuring Cost Efficiency in Banking: Econometric and Linear Programming Evidence," Journal of Econometrics, 46, pp. 229-245. Advertising agencies have economies of scale and scope deriving from transactions in placing media advertisements for their clients, see Silk, A. J., and E. R. Berndt, 1994, "Costs, Institutional Mobility Barriers, and Market Structure: Advertising Agencies as Multiproduct Firms," Journal of Economics &

many sources of economies of scale including automation, standardization of the terms of transactions, and specialization and division of labor in the processing of transactions. Firms can obtain economies of scope by using such methods to handle a variety of different transactions. For example, a retailer handles many different products with a common transaction technology. The specialist also benefits from network economies as a center of transaction activity. Specialists also take advantage of market information obtained by handling many similar transactions.

III. FIRMS CREATE AND MANAGE MARKETS

Firms create and manage markets, so that markets are endogenous institutions. The allocation mechanisms offered by firms are the “microstructure” of markets.⁵⁸ Firms intermediate exchange through their markets and organizations. Firms provide economic value by enhancing the net benefits of transactions, by coordinating transactions, and by developing innovative types of transactions.

III.A Communication and Information Processing

Consumers face communication costs in direct exchange and in forming consumer organizations. Communication takes time and effort and is subject to mistakes. Interaction between individuals may be constrained by social networks. Consumers also face costs of information processing due to human limits on cognition. Groups of consumers face coordination costs in forming social organizations due to costs of communication and information processing.

Firms use both markets and organizations to coordinate the activities of many individuals. Through centralized market mechanisms and organizational processes, firms improve communication and information processing in comparison to what can be achieved by consumers with direct exchange. Many firms specialize in providing communications services such as telecommunications companies, cable television companies, and internet service providers, and Internet backbone providers, and other firms provide travel and transportation services. Most firms, whether retailers, wholesalers, financial firms, or specialized intermediaries, offer communication services as part of their

Management Strategy, 3, Fall, pp. 437-480. Retail stores use computers, cash registers, bar coding and point-of-sale terminals.

⁵⁸ See Spulber, 1999, *supra* note 6, and Spulber, 1998, *supra* note 45.

services.

Distinguishing individuals on each side of the market raises two fundamental issues. First, how do buyers and sellers engage in communication to find each other for the purpose of economic transactions? Buyers and sellers can communicate directly or they can communicate indirectly through firms that act as matchmakers. Second, how do buyers and sellers carry out the computation that is needed to operate the allocation mechanism? Buyers and sellers can handle their own computation through bilateral or multilateral transactions or they can rely on firms that act as matchmakers and market makers. The role of the firm depends on a comparison of the performance of markets in which buyers and sellers engage in direct exchange with that of markets in which firms intermediate between buyers and sellers.

Firms centralize markets by intermediating transactions. Without firms acting as intermediaries, markets tend to be decentralized, with individual buyers and sellers handling all communication and computation tasks. Allocations in decentralized markets are characterized by constraints on communication and computation. Costly communication is likely to lead to random search and inefficient matching of buyers and sellers. Costly computation is likely to involve asymmetric information and inefficient allocation mechanisms. Individuals thus encounter network constraints that limit the efficiency of decentralized exchange.

Firms create centralized markets by providing communication and computation services to buyers and sellers. Firms establish and operate information systems that supply buyers and sellers with some of the means to communicate and process information. Firms engage in communication with buyers and sellers to gather information about their characteristics and to provide information about terms of exchange, such as prices and product features. Firms also engage in computation, through their match making and market making activities.

The two questions about markets with transaction costs are closely related to the information systems used in economic transactions. Information systems contain two essential components. Communication in an information system refers to the exchange of information between individuals and computation in an information system refers to the processing of data that is being exchanged. Information systems generally comprise physical networks involving telecommunications and

connected computers.⁵⁹ Information systems must interact with economic and social networks and human intelligence. Generally, the functions of communication and computation are complementary. Internet users require both the communications capability of the Internet to link to web sites and the computational ability of search engines to locate web sites. Internet auction sites, such as eBay offer both communication between buyers and sellers and computation in the form of automated auctions. Traditional telecommunications systems transmit voice and data and provide guidance through telephone directories.

Markets require the services of information systems to function. Markets consist of transactions between buyers, sellers, and firms. Individuals must communicate to find each other, negotiate the terms of transactions, and monitor performance. Individuals must perform computations to choose between trading partners and to evaluate alternative terms of exchange. Costly communication and computation translate into transaction costs. When communication is costly, buyers and sellers deal with incomplete networks. There is a role for firms to provide communication in the form of matchmaking services. When computation is costly, buyers and sellers engage in bilateral transactions rather than more complex multilateral transactions such as those represented by the core. There is a role for firms to provide computation in the form of market making services. The market classification based on the properties of information systems is shown in Table 1.

Firms employ information systems in creating and managing markets. Firms such as eBay apply information systems to manage

⁵⁹ An industry definition of information system states “1. A system, whether automated or manual, that comprises people, machines, and/or methods organized to collect, process, transmit, and disseminate data that represent user information. 2. Any telecommunications and/or computer related equipment or interconnected system or subsystems of equipment that is used in the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of voice and/or data, and includes software, firmware, and hardware. . . . 3. The entire infrastructure, organization, personnel, and components for the collection, processing, storage, transmission, display, dissemination, and disposition of information.” See Committee T1A1, [renamed Network Performance, Reliability and Quality of Service Committee (PRQC)], 2000, ATIS Telecom Glossary 2000, Washington, DC: Alliance for Telecommunications Industry Solutions.

online auctions. Firms such as Amazon employ information systems for online retailing. Bricks-and-mortar retailers and wholesalers employ information systems to manage their market places.

The theory of the firm distinguishes between the firm and its production technology, in contrast to the neoclassical firm. In electronic commerce, for example, firms are distinct from their information technology. Firms are also distinct from their core competencies and capabilities, which can include operational routines, organizational capital and management strategies. Moreover, firms are distinct from the products and services that they offer to their customers, which can include technologies for implementing electronic commerce. A retailer's costs of establishing a market include the costs of the retail stores themselves. Firms that create financial markets incur costs of operating exchange trading systems.

Computation Communication	Costless computation	Costly computation
Costless communication	Decentralized exchange is feasible Core allocations Walrasian general equilibrium	Buyers and sellers engage in bilateral exchange on complete networks Firms provide computation services: Matchmaking and market making
Costly communication	Buyers and sellers engage in cooperative equilibria on incomplete networks	Buyers and sellers engage in bilateral exchange on incomplete networks

	Buyers and sellers hold auctions on incomplete networks	Buyers and sellers engage in bilateral exchange on random networks
	Firms provide communication services: Gathering and distributing information	Firms provide separate or bundled communication (gathering and distributing information) and computation services (matchmaking and market making)

Table 1 Allocation mechanisms are classified based on the costs of communication and computation.

Market making costs for practically any type of firm include the costs of price adjustment. These are sometimes referred to as menu costs, since restaurants with paper menus must print new menus when prices change. Zbaracki et al find that in addition to the physical costs associated with communicating price changes, there are substantial managerial and customer costs involved in adjusting prices.⁶⁰ Zbaracki et al point out that firms invest in pricing capital such as electronic shelf labeling systems.⁶¹

Market making costs in electronic commerce include the costs of computer software, hardware, and management needed to operate web sites. Electronic commerce is the automation of economic transactions through the use of information systems. Electronic commerce lowers

⁶⁰ See Zbaracki, M. J., M. Ritson, D. Levy, S. Dutta, and M. Bergen, 2004, "Managerial and Customer Costs of Price Adjustment: Direct Evidence from Industrial Markets," *Review of Economics and Statistics*, 86, May, pp. 514-533.

⁶¹ See Zbaracki, M. J., M. Bergen, S. Dutta, D. Levy, and M. Ritson, 2002, "Beyond the Costs of Price Adjustment: Investments in Pricing Capital," Working Paper, University of Pennsylvania.

transaction costs by enhancing communications and computation in exchange between consumers, between consumers and firms, and between firms. Electronic commerce substitutes capital for labor services in the production of transactions, potentially displaces costly labor services applied to routine commercial tasks including the time that employees spend communicating with customers and suppliers regarding prices, product availability, ordering, billing, and shipping. Moreover, electronic commerce enhances the productivity of labor services in commercial activities such as sales, distribution and procurement. Firms improve efficiency by linking external transaction systems with their internal computer systems, thus increasing the frequency, rapidity and accuracy of communication and allowing links to production and inventory management systems within each organization.⁶²

Electronic commerce further enhances communication of transaction information by allowing buyers and sellers to transact with the firm at remote locations and at different times. Thus, the buyers and sellers in an auction on eBay need not be present at the same location and can participate in the auction at different times. This reduces the transaction costs by avoiding the costs of travel and the costs of holding meetings whether those costs would be borne by the firm or its customers and suppliers. Thus, technological change in information processing and communications result in innovations in transaction methods and changes in the organization of firms.

III.B Search and matching

Through centralization of transactions, firms can improve on the efficiency of transactions between consumers. Markets, whether stores, web sites, auction houses, or exchanges, provide central locations where buyers and sellers can meet and transact. Firms reduce search costs by matching buyers and sellers. There are many types of specialized intermediaries and matchmakers that bring buyers and sellers together. Matchmakers operate in markets with homogenous products, introducing buyers and sellers. Matchmaking and brokerage services are of particular importance in markets with differentiated products. Matchmakers take into account buyer and seller characteristics and the features of the

⁶² See Lucking-Reiley, D., and D. F. Spulber, 2001, "Business-to-Business Electronic Commerce," *Journal of Economic Perspectives*, 15, Winter, pp. 55-68.

products or services to be exchanged. Some types of matchmakers do offer mechanisms for exchange, particularly in the case of online auctions and marketplaces, which provide mechanisms for price adjustment and market clearing.

Brokers are common in financial asset markets, including markets for securities, commodity futures, derivatives, insurance, and loans. Brokers bring buyers and sellers together in return for commissions or fees without taking ownership or directly providing the goods and services being exchanged. Firms gather and disseminate buyer and seller information to improve matches and reduce the costs of search. Pure information providers include: Directories such as the Yellow Pages; Print and broadcast media that carry advertisements, Internet-based portals with seller or buyer listings, Web portals and Internet search engines (Yahoo, Google); Publishers of classified advertisements; and Media (book publishers, newspapers, journals, terrestrial and satellite broadcasters).

The many types of matchmaking services include the following: Residential and commercial real estate brokers; Employment and recruiting agencies; Staffing and temporary agencies; Representative agents (literary, talent, sports); and Travel agents and freight transportation brokers. Other types of specialized intermediaries include: Dating and marriage matchmakers; Interest group matchmakers (Meetup.com); Business brokers (for buyers and sellers of businesses); Technology and intellectual property brokers; Commodity and metals brokers; Ship brokers; Art brokers; and Consignment, and resale stores. Firms intermediate between businesses through various brokerage activities and business-to-business marketplaces. The Chinese web site Alibaba.com brings buyers and sellers together across country borders for over 200 countries in practically every industry, illustrating their motto "Global trade starts here."

Firms reduce search costs by aggregating buyer demands and seller supplies. Such aggregation avoids inefficiencies that result from mismatches between individual buyer demands and individual seller supplies. Firms can break up large orders, combine small orders, and match total demand and supply. Large-scale firms also improve market efficiency by bringing together many buyers and sellers, thus reducing reliance on small-scale dealers. By posting prices, market makers provide efficiencies in comparison with a market in which consumers must search across dealers for the best price.

Buyers participate in markets based on their expectations of seller

participation and sellers participate in markets based on their expectations of buyer participation. To reduce search costs in financial markets, many types of firms perform market-making functions that bring liquidity to the market. Firms stand ready with funds needed to buy assets if there are not sufficient buyers and they stand ready with financial assets if there are not sufficient sellers. Buyers and sellers can enter the centralized market with confidence that they are unlikely to be rationed due to the absence of a trading partner.

Market makers are dealers that offer to buy and sell financial assets at posted prices. They assure buyers and sellers of liquidity if there are not sufficient counter parties available. Firms that provide liquidity in financial markets include: block traders, who are dealers that handle large trades, value traders who speculate based on superior information about price movements and asset values, and arbitrageurs who identify differences in the supply and demand for liquidity across markets.⁶³ In addition, organized exchanges for securities and derivatives provide specialists who act as market makers by quoting bid and ask prices and acting as dealers. Buyers and sellers of financial assets benefit from the liquidity supplied by market makers. Investors can hold assets without being concerned about selling the asset in the future. Other financial firms such as banks and mutual fund companies act as market makers by standing ready to make loans or take deposits or to buy and sell financial assets.

Firms in product markets act as market makers by providing immediacy to their suppliers and customers.⁶⁴ Retailers and wholesalers stand ready to buy from their suppliers and they keep inventories on hand to serve their customers. By aggregating demands and suppliers, specialized firms pool demand-side and supply-side risk.⁶⁵ With market

⁶³ See Larry Harris, 2003, Trading and Exchanges: Market Microstructure for Practitioners, New York: Oxford University Press, for a practical guide to these financial firms. These definitions are adapted from the institutional discussion in Harris.

⁶⁴ See Clower, R., and A. Leijonhufvud, 1975, "The Coordination of Economic Activities: A Keynesian Perspective," American Economic Review, 65, pp.182-188.

⁶⁵ See Lim, C., 1981, "Risk Pooling and Intermediate Trading Agents," Canadian Journal of Economics, 14 (2), May, pp. 261-267; and Spulber, D. F., 1985, "Risk Sharing and Inventories," Journal of Economic Behavior and Organization, 6, pp. 55-68.

making by firms, consumers need not hold inventories since they can rely on firms to have products on hand when needed. Suppliers can bring products to market when it is convenient to provide them, since they can rely on firms to purchase the products. Demsetz notes that in securities markets “the ask-bid spread is the markup that is paid for predictable immediacy of exchange in organized markets; in other markets it is the inventory markup of retailer and wholesaler.”⁶⁶

Matching problems arise even without search costs. Consumers face the absence of a double coincidence of wants when they cannot achieve an efficient allocation through bilateral trades. Firms alleviate this problem by serving an intermediary, thus replacing money as a medium of exchange. Firms also create money by providing various payment systems, including checks and credit cards. The absence of the coincidence of wants can also arise when a buyer and a seller cannot transact with each other at the same time.⁶⁷ The firm addresses such timing issues through market making, standing ready to buy and sell. The absence of a double coincidence of wants can occur when trading partners are in different locations. Firms can solve this problem by intermediating between consumers in different locations. By operating in multiple locations, the firm also reduces the costs of communication and search for consumers who deal with the local branch of the firm. Consumers encounter the absence of a double coincidence of wants when they cannot trade in different states of the world. By creating financial assets, firms allow consumers to carry out exchange under uncertainty and transfer resources across uncertain states.

III.C Bargaining

Consumers incur bargaining costs in direct exchange and in establishing consumer organizations. Coase points out that “[t]he costs of negotiating and concluding a separate contract for each exchange transaction which takes place on a market must also be taken into account.”⁶⁸ Coase observes that in certain markets, techniques are devised for minimizing but not eliminating these costs, such as exchanges for fresh produce.

⁶⁶ See Demsetz, H., 1968, “The Cost of Contracting,” Quarterly Journal of Economics, 87, February, pp. 33-53.

⁶⁷ See also Clower and Leijonhufvud, 1975, *supra* note 61.

⁶⁸ Coase, 1937, *supra* note 6.

Firms have an arsenal of mechanisms for improving the efficiency of transactions relative to bargaining between consumers. These transaction mechanisms might not be feasible for consumers. Firms offer standardized contracts and other routine business processes that reduce bargaining costs. Firms standardize business processes and achieve economies of scale in transactions. By centralizing exchange, firms can post prices, operate auctions, and standardize exchange.

The firm's posted prices or its auction mechanisms perform a critical separation between buyer demands and seller supplies. With posted prices, the firm trades with buyers who have a willingness to pay above the firm's ask price and the firm trades with sellers who have a cost below the firm's bid price. With double auctions, the firm identifies high-willingness-to-pay buyers and low-cost sellers and separates demands and supplies through the equilibrium prices chosen by the auction.

Firms consolidate the demands of many customers or the supplies of many sellers. The firm then can post prices on the basis of aggregate information about the demand of its customers or the supply offered by its sellers. Alternatively, the firm can gather more detailed information about demand and supply through auction mechanisms or through repeated observation purchases and sales.

There are advantages to posted prices in comparison with bilateral negotiation. Posted prices are convenient for buyers or sellers relative to the time and effort required in negotiating exchange. Transacting at posted prices also removes the uncertainty that may be present in bilateral exchange if consumers have imperfect information about trading partners and thus do not know the outcome of bargaining. Transacting at posted prices improves the value of transactions relative to random matching of buyers and sellers. By adjusting prices to maximize profits, firms balance supply and demand, thus establishing market clearing prices.

Firms can design markets and allocation mechanisms to overcome the effects of imperfect information. The firm adjusts prices such that its purchases and sales clear the market, so that the firm performs the market-clearing function that neoclassical economics ascribes to the Walrasian auctioneer. Market clearing further reduces inefficiencies that might accompany search and bilateral exchange.

Net gains from trade in an economy with firms can be increasing in the number of consumers if the firm obtains economies of scale in transactions. Such scale economies can be due to fixed costs of

communication and information processing. There may also be benefits from dealing with many consumers if the firm aggregates information. The firm also benefits from dealing with many consumers if it can pool risks. Finally, the firm increases efficiency by dealing with many consumers if doing so improves the effectiveness of market making. When there are many buyers and sellers, market makers benefit from increased liquidity.

Firms are intermediaries that coordinate buyers and sellers.⁶⁹ Buyers and sellers transact with a firm rather than engaging in direct exchange if the firm increases the benefits minus the costs of the transaction. In practice, firms incur many of the costs of buying and selling, including searching for trading partners, establishing prices, communicating price and product information, negotiating and writing contracts, arranging payments, recording exchange data, and monitoring contractual performance. Firms can reduce the costs of transactions by internalizing some parts of the exchange. Wholesalers and retailers are specialized firms that focus on distribution and sales.

Firms aggregate transactions to create benefits from coordination and scale, thus acting as market makers. In other cases, firms disaggregate transactions to create benefits from matching buyers and sellers more precisely, thus acting as intermediaries. In still other cases, firms create new types of transactions bringing buyers and sellers together in innovative ways. Chandler identifies large corporations and their managers as the "visible hand" responsible for a large share of economic decision making.⁷⁰

III.D Moral hazard

The firm addresses the problem of moral hazard through market contracts and within its organization through incentives for managers, employees, and business units. The firm can reward agents based on their performance and a measure of aggregate performance. Holmström points out that with common uncertainty, by the theory of sufficient statistics, the optimal incentive scheme need only use aggregate information about the performance of peers.⁷¹ When the outputs of individuals are linked through common uncertainty, joint compensation

⁶⁹ See Spulber, 1998, *supra* note 45, and Spulber, 1999, *supra* note 7.

⁷⁰ Chandler, 1977, *supra* note 15.

⁷¹ Holmström, B., 1982, "Moral Hazard in Teams," Bell Journal of Economics, 13, pp 324-340.

schemes dominate rewards based strictly on individual performance.⁷²

A firm can contract simultaneously with many principals and many agents. The firm can organize the market differently from bilateral exchange. The firm can act as a central intermediary between the group of principals and the group of agents. This yields two potential advantages for the firm. The firm can aggregate information about agent performance. This can reveal information when there is statistical interdependence between the random shocks to agent outputs. This allows the firm to connect contracts and improve their performance. The firm can reward agents based on their relative performance. This can induce agents to compete with each other. Agents may devote more effort to production in a competitive situation than in a bilateral contract.

III.E Adverse selection

Markets and organizations provide solutions to the problem of adverse selection. Through market mechanisms, firms address asymmetric information that impedes bilateral exchange. The firm's reputation, quality certification, and economies of scale in gathering information help to mitigate some types of adverse selection problems.

When parties to economic relationships have asymmetric information, inefficient transactions can be the result. Buyers and sellers that have asymmetric information about their preferences and costs respectively, they may engage in inefficient levels of trade. In the relationship between a principal and agent, asymmetric information can result in departures from efficiency. Parties with private information command information rents that are necessary to induce them to reveal their private information. Providing information rents tends to distort economic interactions. Firms can mitigate problems of asymmetric information in bilateral exchange by acting as intermediaries.

Firms can reduce some effects of adverse selection through market mechanisms. Asymmetric information can create losses for an intermediary if some agents are better informed about the value of the assets that are being exchanged. The firm compensates for expected

⁷² Nalebuff and Stiglitz point out that when all of the outputs are independent, the optimal compensation scheme can be based on each seller's individual output, so there is no advantage to joint compensation schemes. See Nalebuff, B. J., and J. E. Stiglitz, 1983, "Prizes and Incentives: Towards a General Theory of Compensation and Competition," Bell Journal of Economics, 14, pp. 21-43

losses by extracting rents from less informed agents.⁷³ The market maker must deal with informed and uninformed traders. The informed traders may have better information than the intermediary about the value of the asset. Thus, the informed traders may know that the value of the asset is above the ask price or below the bid price. In this case, trading with informed traders results in losses for the intermediary. Uninformed traders are said to trade for liquidity and purchase at the ask price or sell at the bid price, depending upon their estimates of the asset value of liquidity requirements. The firm can set bid and ask prices to recover losses from trades with informed agents through trades with uninformed agents. This allows the firm to provide liquidity services to the uninformed traders. Firms also reduce the effects of adverse selection by offering monitoring efficiencies.⁷⁴

III.F Contracting

⁷³ In this way, adverse selection affects the bid-ask spread in financial markets, see Copeland, T., and D. Galai, 1983, "Information Effects on the Bid/Ask Spread," Journal of Finance, 38, 1457-1469, and Glosten, L., and P. Milgrom, 1985, "Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders," Journal of Financial Economics, 14 (1985), 71-100.

⁷⁴ Melumad, Mookerjee and Reichelstein (1997) show the advantages of delegated contracting when contract contingencies are costly, see Melumad, N., D. Mookherjee, and S. Reichelstein, 1997, "Contract Complexity, Incentives, and Value of Delegation," Journal of Economics & Management Strategy, 6, 2, Summer, pp. 257-290. The analyses of Diamond (1984), Ramakrishnan and Thakor (1984), Williams (1986), Krasa and Villamil (1992), and others, establish that delegated monitoring is superior because of diversification by intermediaries. See Diamond, D. W., 1984, "Financial Intermediation and Delegated Monitoring," Review of Economic Studies, 51, pp. 393-414; Ramakrishnan, R. T. S., and A.V. Thakor, 1984, "Information Reliability and a Theory of Financial Intermediation," Review of Economic Studies, 51, no. 3, pp. 415-432; Williams, J., 1986, The Economic Function of Futures Markets, Cambridge: Cambridge University Press; Krasa, S., and A. Villamil, 1992, "Monitoring the Monitor: An Incentive Structure for a Financial Intermediary," Journal of Economic Theory, 57, pp. 197-221.

Consumers engaged in bilateral exchange may encounter contracting costs. These costs include the costs of negotiating and writing contingent contracts, monitoring performance, and enforcing the terms of contracts. The reluctance of parties to invest in relationships subject to renegotiation is known as the “hold-up” problem. Economic analyses of the hold-up problem emphasize internalization through vertical integration. As is discussed in the next section, a buyer and a seller vertically integrate to avoid contracting problems and to improve incentives for invest. Even with contracting costs, however, the hold-up problem need not lead to vertical integration.

Firms can address the hold-up problem with market transactions that intermediate between buyers and sellers. By creating and managing markets, firms reduce the potential for renegotiation. Centralized markets reduce contracting costs in comparison with decentralized exchange that requires search and bargaining. Buyers and sellers are not tied to a bilateral relationship. The efficiency of markets improves returns to investment in comparison to direct exchange. The standardization of transactions and allocation based on price mechanisms allows buyers and sellers to make investments that are not subject to hold up.

III.G Free riding

Free riding arises in a variety of contexts. Partnerships that engage in joint production encounter free riding when the efforts of partners are unobservable. There are incentives for free riding because the benefits are divided among its members. Each member receives only a share of the marginal contribution of their effort to the output of the partnership. The firm addresses this type of free riding by consolidating management in the hands of a single CEO. The corporation’s shareholders delegate management to the CEO, which can lead to moral hazard problems since the CEO’s effort is unobservable and the CEO’s ownership share is constrained by limited liability. Smaller partnerships perform better than the corporation, since agency costs of delegating management to the CEO exceed the costs of free riding in the partnership. The corporation performs better than larger partnerships since agency costs of delegating management to the CEO are less than the costs of free riding in the partnership.

Consumer cooperatives encounter free rider problems in allocating joint costs. Free rider problems affect the provision of public goods and the joint use of common property resources. The firm addresses free riding in cost allocation for both private goods and public

goods through the use of pricing mechanisms that may not be available to consumer cooperatives. The firm reduces consumption externalities when there are common property resources through unifying the control of the resource.

IV. Firms Create and Manage Organizations

Firms incur organizational transaction costs. The firm must decide how to divide its activities between markets and organizations. For any given scope of activities, such a division determines the firm's extent of vertical integration. The extent of vertical integration refers to the activities carried out by the firm's organization. These internal activities often are referred to as the "boundaries of the firm" but might more accurately be termed the "boundaries of the organization." The "internalization hypothesis" states that firms will substitute organizational transactions for market transactions when doing so lowers transaction costs.

Economic analysis of firms has focused much attention on explaining vertical integration. The comparison of market transactions and organizational transactions is an important theme in the literature on institutional economics.⁷⁵ Commons distinguishes between bargaining transactions, which take place in the market, and managerial transactions, that take place within the organization.⁷⁶ The empirical

⁷⁵ See Commons, 1931, supra note 9; Coase, 1937, 1988, 1994, supra note 6; Williamson, 1975, 1985, supra note 6; Spulber, 1999, supra note 7; and Furubotn, E. G., and R. Richter, 2000, Institutions and Economic Theory: The Contribution of the New Institutional Economics, Ann Arbor: University of Michigan Press.

⁷⁶ According to John R. Commons (1931) "Transactions, as derived from a study of economic theories and of the decisions of courts, may be reduced to three economic activities, distinguishable as bargaining transactions, managerial transactions and rationing transactions." Finally, Commons refers to rationing transactions as those originating from courts, legislatures or regulatory bodies. For Commons, "The bargaining transaction derives from the familiar formula of a market, which, at the time of negotiation, before goods are exchanged, consists of the best two buyers and the best two sellers on that market." In the case of managerial transactions "by which wealth itself is produced," there are hierarchical relationships: "The master, or manager, or foreman, or other executive, gives orders -- the servant or workman or other subordinate must obey."

literature on the firm has extensively tested the effects of transactions costs on vertical integration. The “internalization hypothesis” posits that increases in market transaction costs, relative to the firm’s organization costs, explain greater internalization of those transactions through vertical integration.⁷⁷

IV.A Communication and Information Processing

Firms establish organizations as a means of implementing market transactions and as a way of managing organizational transactions. Firms can improve the efficiency of transactions by substituting transactions within an organization for arms-length transactions, as Coase emphasized.⁷⁸ Firms can be complex organizations with many members and many trading partners. They allocate resources within their organizations, including labor services, capital financing, parts and components, and intellectual property. Firms coordinate the activities of their employees through many types of management procedures and organizational relationships.

Within the organization, firms have extensive communication systems, including the hierarchical chain of command, internal networks of relationships, and information technology networks. The firm’s organization addresses the problem of bounded rationality. The collective efforts of members of the organization overcome some of the limits on the cognition of individuals. Individuals working together in an organization can presumably collect and analyze greater amounts of information than individuals working separately. These affect the ability of individuals to make complex decisions. Of course, there are well known limits on the abilities of organizations as well, such as organizational conflict and bureaucratic inertia.

⁷⁷ Harold Demsetz suggests that since making and buying each entail both management and transaction costs, the question is “whether the sum of management and transaction cost incurred through in-house production is more or less than the sum of management and transaction cost incurred through purchase across markets, since either option entails expenditures on both cost categories.” See Demsetz, H., 1991, “The Theory of the Firm Revisited,” in Oliver E. Williamson and Sidney G. Winter, eds. The Nature of the Firm, Oxford: Oxford University Press, pp. 159-178.

⁷⁸ Coase, 1937, supra note 6.

Herbert Simon examines the implications of limited cognition for organizations.⁷⁹ The organization must deal with limits on an individual's ability of perform tasks and make decisions.⁸⁰ The bounded rationality of managers and subordinates results in the need to delegate authority and share information within the organization.⁸¹ The decisions of managers and employees may involve satisficing, rather than optimizing, which must be addressed by the design of incentives for individual performance. Because of limits on the knowledge, computation, and decision-making capacity of individuals, the organization breaks large tasks into smaller ones, achieving organizational goals by assigning subgoals to units of the organization.⁸² March and Simon concludes that organizations engage in adaptive behavior to deal with complexity in decision making.⁸³ Cyert and March present a behavioral theory of the firm that is based on a systems view of strategy-making.⁸⁴ They describe decision making by firms as a process of goal setting, feedback, adaptation, and search.⁸⁵ By combining the forces of many decision makers and taking advantage of specialization and division of labor, organizations can potentially improve information processing and the accuracy of decision making. Knight finds that assignment of individuals to managerial positions may reflect greater

⁷⁹ Simon, H.A., 1945, Administrative Behavior, 3rd edition, New York: Free Press; Simon, H.A., 1955, "A Behavioral Model of Rational Choice," Quarterly Journal of Economics, 69, pp. 99-118; and Simon, H.A., 1972, "Theories of Bounded Rationality," in C.B. McGuire and R. Radner, eds., Decisions and Organizations, Amsterdam: North Holland, pp. 161-176.

⁸⁰ See Simon, 1945, at 39.

⁸¹ However, Simon (1945, pp. 81-84) cautions that there are limits to rationality that affect the functioning of the organization: incomplete knowledge, imperfect anticipation of future events, and difficulty in identifying all possible alternatives.

⁸² See March, J. G. and H. A. Simon, 1958, Organizations, New York: John Wiley & Sons, at 168.

⁸³ March and Simon, 1958, id.

⁸⁴ See Cyert, R. M., and J. G. March, 1963, A Behavioral Theory of the Firm, Englewood Cliffs, NJ: Prentice Hall.

⁸⁵ Williamson (1975, supra note 6, at 40) observes that organizations may facilitate "adaptive, sequential decision making, thereby to economize on bounded rationality."

capacity for decision-making and information processing.⁸⁶ Stinchcombe suggests that the “social structure of organizations can be explained by the structure of the information problem they are confronted with.”⁸⁷ Arrow argues that since information is costly, it is more efficient to transmit the information centrally, that is through the upper levels of the hierarchy.⁸⁸ The bounded rationality of economic actors and costly interaction within the organization in turn create bureaucratic inertia and impose limits on the performance of organization in handling uncertainty.

Limits on the rationality of individuals constrain their ability to form productive teams. Organizations develop mechanisms to reduce the resulting inefficiencies yielding transaction benefits that might not be achieved through market transactions between team members. The costs of communication channels is highlighted by Marschak and Radner's classic model of communication in teams in which each member of a team imperfectly observes the current state of the world at some cost, with the decisions of the team depending on what (costly) channels of communication are established.⁸⁹ In their framework an organizer is faced with the problem of designing an organizational network that yields the highest expected payoff “net of the costs of observation, communication and computation” incurred by members of the team.⁹⁰ They further point out that the activities of the organizer also are likely to entail similar costs of decision making, as well as costs of resolving conflicts and allocating tasks.

Firms offer management and unity of purpose. This contrasts with basic partnerships and cooperatives which are subject to group decision making. Operating an organization as a collective agreement can be difficult and inefficient when transaction costs are present. Consumers face all of the complexities and inefficiencies of collective decision making. They face the costs of communication and negotiating with each other. . Even if consumer-owners were to agree unanimously,

⁸⁶ Knight *supra* note 6.

⁸⁷ See Stinchcombe, A. L., 1990, Information and Organizations, Berkeley, CA: University of California Press, p. 29.

⁸⁸ See Arrow, K. J., 1974, The Limits of Organization, New York: Norton, p. 68.

⁸⁹ See Marschak, J., and R. Radner, 1972, Economic Theory of Teams, New Haven: Yale University Press.

⁹⁰ See Marschak and Radner, 1972, at 313.

they also face the costs of continually monitoring the complex activities of the enterprise to ensure conformity with their plans. They may need to make frequent adjustments in their strategies and instructions. These types of transaction costs suggest the need for managers. Rubinstein examines the organizational implications of bounded rationality in terms of the complexity of group decision making.⁹¹ Groups have difficulties in making optimal decisions because of the cost of establishing channels of communication between members of the organization, the time costs of sequential communication, and the costs of aggregating preferences in group decision making. As is well known from the social choice literature, group decision making can fail to rank alternatives in transitive manner. Firms provide a hierarchical structure in which managers assign tasks, design incentives, and monitor the performance of subordinates. Firms may offer efficiencies in comparison to consumer organizations due to differences in governance.

IV.B Search and matching

Organizations offer an alternative to search in the market place. Within its organization, the firm reduces search costs by designing activities that match managers and employees with diverse capabilities. The firm's organizational units combine economic activities that benefit from repeated interaction without the need to search for trading partners. As organizational designer, the firm provides centralized mechanisms for planning, management, resource allocation, and task assignment. Firms benefit from economies of scale in information technology.

The firm searches in the labor market for managers and employees with various skills and capabilities. The firm benefits from scale economies in search, hiring, and personnel management. The firm matches its managers and employees to specific tasks without the need for individuals to search for each other in the market place. Relationships between jobs within the organization can remain stable even as personnel enter and depart the firm.

Organizations reduce search costs through internal allocation mechanisms for financial capital and other resources. Firms reduce search costs by holding inventories and engaging in multiple activities. Vertically integrated firms combine multiple tasks to address demand-side and supply-side risks. Vertically integrated firms avoid some costs

⁹¹ See Rubinstein, A., 1998, Modeling Bounded Rationality, Cambridge, MA: MIT Press.

of searching for new suppliers when they change product specifications or update their production technology.

Coase emphasizes vertical integration as a means of avoiding the “disadvantages” of using the price mechanism.⁹² The costs of market transactions that Coase identifies include the use of short-term contracts in comparison with longer-term contractual relations within the firm. The firm has a wide range of mechanisms within its organization that differ fundamentally from what can be done in the market place, either between the firm and its trading partners or between consumers engaged in direct exchange. These mechanisms can lower the costs of organizational transactions relative to market transactions.

Coase finds that firms carry out various production tasks to reduce the costs of searching for prices, negotiating individual transactions, and specifying contingencies in long term contracts. Thus, “by forming an organization and allowing some authority (an ‘entrepreneur’) to direct the resources, certain marketing costs are saved”.⁹³ Coase adds that “[t]he main reason why it is profitable to establish a firm would seem to be that there is a cost of using the price mechanism.” Coase observes that “[t]he most obvious cost of ‘organizing’ production through the price mechanism is that of discovering what the relevant prices are.”

For Coase, the firm’s make-or-buy decision is based on comparing the costs of market transactions with the costs of organizational transactions. If market transactions are more costly than organizational transactions, the production activity should be located within the firm. If market transactions are less costly than organizational transactions, the productive activity should be located outside the firm, with the firm relying on suppliers for the good or service. Transaction costs are the determinants of the firm’s collection of activities. The make-of-buy choice shows that the critical activity is not production of goods, since any production activity could be outside or inside any particular firm. The critical activity is the transaction.

IV.C Bargaining

By establishing organizations, firms centralized transactions within the firms. This has the potential to reduce bargaining costs through internal allocation and pricing systems and managerial decision making.

⁹² See Coase, 1937, *supra* note 6, at 390.

⁹³ See Coase, 1937, *supra* note 6, at 392.

Through hierarchies, relational contracts, and managerial assignment of tasks, organizations can reduce the need for negotiation in comparison with market alternatives.

The ability of organizations to reduce transaction costs is offset by internal rent seeking, political conflicts, and the inertia that afflicts bureaucratic systems. Workers engage in “influence” activities seeking promotions, perks, and job assignments.⁹⁴ Internal politics give organizations a distinct disadvantage in comparison with market contracts.⁹⁵ Workers compete to change the firm’s objectives and strategy. Such activities can be useful when they motivate employees to improve their performance or to reveal information. However, such activities can be costly when they displace productive effort with political effort. The firm may expend considerable costs in mitigating the influence activities of employees. The firm’s choice between market contracts and forming an organization must weigh the benefits and costs of organizational politics.

Within the organization, the firm establishes systems for communication and information processing. The firm establishes a hierarchy and defines responsibilities and authority for managers and

⁹⁴ See Milgrom, P., and J. Roberts, 1988, “An Economic Approach to Influence Activities in Organizations,” American Journal of Sociology, 94, Supplement, pp. S154-S179.

⁹⁵ Milgrom and Roberts suggest that “efficient organization is not simply a matter of minimizing transaction costs” and compare the costs of bargaining over short-term market contracts with the influence costs that result from centralized control of organizations, see Milgrom, P., and J. Roberts, 1990, “Bargaining Costs, Influence Costs, and the Organization of Economic Activity,” in J. Alt and K. Shepsle, eds., Perspectives on Positive Political Economy, Cambridge: Cambridge University Press, pp. 57-89, at 58. Influence costs refer to political rent seeking within the firm, see also Milgrom and Roberts (1988, *supra* note 92) and Milgrom, P., and J. Roberts, 1992, Economics, Organization, and Management, Englewood Cliffs, NJ: Prentice Hall. Scharfstein and Stein find that rent-seeking by division managers results in greater overall compensation from the CEO in the form of capital budget allocations that reduce the efficiency of internal capital markets, see Scharfstein, D. S., and J. C. Stein, 2000, “The Dark Side of Internal Capital Markets: Divisional Rent-Seeking and Inefficient Investment,” Journal of Finance, American Finance Association, vol. 55 (6), December, pp. 2537-2564.

employees. The firm provides a set of rules and conventions. In coordinating transactions within the firm, firms use planning, commands, and incentive mechanisms. The firm creates internal allocation mechanisms, transfer prices, and incentives for performance. Organizational transactions include exchange of goods and services, distribution of financial capital and allocation of labor services.

Organizational transactions are costly. There are also costs of coordinating managers and employees. There are costs of managing operations and market activities, human resource administration and personnel employment, accounting and financial reporting, and use of communications and information technology. Within the organization as well as the costs of internal transactions and transactions that cross organizational boundaries. Organizational costs also include the costs of supporting the firm's market transactions.

The firm's organization costs should be compared to those of consumer organizations. Such organizations include buyers' cooperatives, workers' cooperatives, and basic partnerships. Firms may have advantages if they reduce bargaining costs relative to consumer organizations. However, Aoki argues that firms engage in extensive bargaining within their organizations.⁹⁶

The firm's organizational activities support their market making functions. Firms establish purchasing departments to locate suppliers, to learn about prices and product features, and to communicate their purchasing requirements. The firm's employees keep track of transactions with suppliers including preparing bills and receipts and monitoring supplier performance. Within the organization, managers allocate equipment and facilities, control inventories, and assess input requirements. Firms establish finance departments that carry out transactions to obtain capital in addition to financial management. Firms communicate with lenders and investors regarding the firm's performance and the firm's need for funds. Within the organization, firms undertake the transactions necessary to account for costs and revenues, to allocate funds to various projects and to budget over time.

Firms establish personnel departments to handle labor market transactions in addition to labor management tasks. Due to imperfect information, firms must find potential employees and communicate wages and job descriptions. Within the organization, firms evaluate job

⁹⁶ See Aoki, M, 1986, The Co-operative Game Theory of the Firm, New York: Clarendon Press.

performance and provide employees with various performance incentives. The personnel departments of firms handle payment of wages as well as the complex transactions associated with human resources. Personnel departments manage such things as work schedules, benefits, health insurance, retirement funds, and tax payments.

IV.D Moral hazard

Firms address moral hazard problems through organizational transactions. Within organizations, firms gather information about the performance of managers and employees. They also obtain signals about the efforts of managers and employees through investment in monitoring. Firms employ various types of incentive contracts to induce revelation of private information that may enhance productive performance and improve the assignment of managers and employees to tasks.

Principal-agent relationships encounter transaction costs due to unobservable effort leading to moral hazard. Vertical integration between firms in an agency relationship may be more efficient if organizational transactions are more effective than market transactions.⁹⁷ The firm's organization has advantages over market transactions if it does better at addressing moral hazard problems. Organizational transactions offer benefits if the principal can design tasks within the organization to reduce the effects of unobservable effort, if the principal can improve monitoring of agent performance within the organization, or if the principal can improve incentives for performance by agents. The costs of monitoring agent efforts may drive internalization.⁹⁸

IV.E Adverse selection

⁹⁷ Lafontaine and Slade point out that empirical studies of forward integration into retailing tend to be based on incentives and moral hazard arguments, see Lafontaine, F. and M. Slade, 2007, "Vertical Integration and Firm Boundaries: The Evidence," Journal of Economic Literature, 45, September, pp. 629-685.

⁹⁸ Holmström and Milgrom present a model in which pay for performance, asset ownership, and task design are complementary instruments, see Holmström, B., and P. Milgrom, 1994, "The Firm as an Incentive System," The American Economic Review, vol. 84, no. 4, September, pp. 972-991.

Unobservable information reduces the efficiency of market transactions. Firms can mitigate adverse selection problems within the organization if principals are better able to design incentives for agents to reveal information, if principals can gather information more effectively, or if principals can better motivate performance. A key element of the firm's contribution is to break the budget-balancing constraint. Thus, for any set of consumers, all bilateral and multilateral transactions balance. With asymmetric information about actions or player types, bilateral and multilateral transactions are subject to moral hazard, adverse selection, free riding and other inefficiencies.

The firm acts as residual claimant in transactions with employees and with trading partners. This allows the firm to create transactions that enhance consumer benefits. With bilateral exchange, for example, two consumers share the net gains from trade. With intermediated exchange through a firm, the net gains from trade are shared between the two consumers and the firm. This opens up an infinite variety of ways to divide the surplus between the consumers, with the firm acting as the residual claimant.

The same applies with many consumers. By acting as a residual claimant, the firm can improve the performance of economic transaction in comparison to a group of consumers sharing the total returns from cooperation. Acting as the residual claimant, the firm can design transactions that improve incentives for consumers to supply effort thus alleviating the moral hazard problem. The firm can improve incentives for consumers to report information truthfully and reduce adverse selection problems.

The budget for the group of n consumers plus the firm still must balance in the absence of free disposal. However, the budget for the group of consumers can run a deficit because the firm earns a profit. To break the budget balancing constraint for a group of consumers, the firm must be a separate and independent entity. The firm cannot simply be an aggregate of consumers.

It is independence of action that gives the firm the ability to improve economic efficiency. The firm's addition of degrees of freedom can significantly reduce transaction costs. Consumers may form a buyers' cooperative, a workers' cooperative, or an investors' partnership. Also, consumers may engage in bilateral and multilateral transactions or form bilateral and multilateral contracts. All of these situations are subject to collective budget-balancing restrictions.

The theory of mechanism design shows that strategic interaction

between economic actors can be represented as an incentive mechanism. Consumers face the problem of finding allocation mechanisms that are incentive compatible when actions are imperfectly observable or when information is distributed asymmetrically. Such an allocation mechanism must be individually rational to guarantee that consumers will choose to participate in the collective action. Consumers must be made at least as well off as they would be outside the cooperative, partnership, or contract.

Well-known results from the theory of mechanism design find that the balanced budget requirement is highly restrictive. Green and Laffont show that a mechanism that can be implemented using dominant strategies and that satisfies the budget-balancing condition will fail to maximize total benefits of the economic agents involved.⁹⁹ Suppose that implementation with Bayesian Nash strategies is allowed. Also, suppose that individual rationality must be satisfied to guarantee participation. Then, under some conditions, the mechanism again may fail to maximize expected benefits if budget balancing is required. With asymmetric information and voluntary participation, there is generally no mechanism that is ex post efficient.¹⁰⁰

The departures from efficiency that are associated with budget balancing highlight the problems faced by consumers acting without

⁹⁹ See Green, J., and J.-J. Laffont, 1977, "Characterization of Satisfactory Mechanisms for the Revelation of Preferences for Public Goods," Econometrica, 45, pp. 427-438; and Green, J. R., and J.-J. Laffont, 1979, Incentives in Public Decision Making, Amsterdam: North Holland. A mechanism that maximizes total benefits is one due to Groves, T., 1973, "Incentives in Teams," Econometrica, 41, 4, pp. 617-631. See also Vickrey, W., 1961, "Counterspeculation, Auctions and Competitive Sealed Tenders," Journal of Finance, 16, pp. 8-37; Clarke, E., 1971, "Multipart Pricing of Public Goods," Public Choice, 2, pp. 19-33; and Groves, T., and M. Loeb, 1975, "Incentives and Public Inputs," Journal of Public Economics, 4, pp. 211-226.

¹⁰⁰ See Arrow, K. J., 1979, "The Property Rights Doctrine and Demand Revelation under Incomplete Information," in Economics and Human Welfare, ed. by M. Boskin, New York: Academic Press, pp. 23-39; d'Aspremont, C., and L. A. Gérard-Varet, 1979, "Incentives and Incomplete Information," Journal of Public Economics, 11, pp. 25-45; and Mas-Colell, A., M. D. Whinston, and J. R. Green, 1995, Microeconomic Theory, New York: Oxford University Press.

firms. In bilateral and multilateral transactions, problems of moral hazard and adverse selection can occur. In consumer groups, such as the buyers' cooperative, workers' cooperative, or investors' partnership, free riding can occur. The firm, as a residual claimant can employ a wider class of mechanisms by relaxing the budget balancing constraint for the group of consumers. With the establishment of the firm as an independent entity, the budget surplus from the mechanism is the firm's profit.¹⁰¹ The firm can improve efficiency relative to the budget-balancing mechanisms available to consumers without the firm.

Organizations offer advantages over decentralized exchange by combining principal-agent relationships in various ways. In hierarchies, principals delegate some types of contractual design and monitoring to subordinates, creating principal-supervisor-agent relationships with supervisors acting as "middle principals."¹⁰² Melumad, Mookerjee and Reichelstein point out that delegated contracting can be a means of distributing information processing among members of the organization.¹⁰³ The advantages of overcoming bounded rationality come at the cost of loss of control.¹⁰⁴

¹⁰¹ In fact, the Vickrey-Clarke-Groves mechanism maximizes the budget surplus as compared to other efficient mechanisms. See Krishna, V., and M. Perry, 1998, "Efficient Mechanism Design," Working Paper, Pennsylvania State University, April; and V. Krishna, 2002, Auction Theory, New York: Academic Press. Thus, the firm can offer consumers a mechanism that maximizes its profit over all efficient mechanisms. As long as the firm's decisions are separate from the decisions of consumers, then redistribution of the firm's profit to its consumer-owners need not eliminate the beneficial budget-breaking effect of profits. With separation of consumer and firm decisions, redistribution of firm profits allows for a general equilibrium representation of the economy with firms.

¹⁰² See for example Geanakoplos, J. and P. Milgrom, 1991. "A theory of hierarchies based on limited managerial attention," Journal of the Japanese and International Economies, Elsevier, vol. 5, no. 3, September, pp. 205-225; and Qian, Y., 1994, "Incentives and Loss of Control in an Optimal Hierarchy," Review of Economic Studies, 61, pp. 527-78.

¹⁰³ See Melumad, Mookherjee, and Reichelstein, 1997, *supra* note 71.

¹⁰⁴ On the advantages of delegated contracting when contract contingencies are costly, see Melumad, Mookerjee and Reichelstein (1997).

Firms may derive competitive benefits from forming organizations. The firm's organization and centralization of contracting may be necessary to respond to competition from other firms. Esther Gal-Or discusses the literature on decentralization versus consolidation of contracting rights when there is competition in the product market.¹⁰⁵ Gal-Or shows that product market competition increases the incentives of principals to vertically integrate because otherwise their agents have better market information.¹⁰⁶ Gal-Or further shows that competition affects the allocation of tasks within the organization, leading to organizational differences across firms.¹⁰⁷ Some firms may prefer to consolidate tasks within their organization while others prefer to departmentalize. These decisions depend on the intensity of competition, information asymmetries, and equilibrium behavior by competitors. Competition affects how firms choose between creating markets and forming organizations.

IV.F Free riding

Consumer organizations such as workers' cooperatives, buyers' cooperatives, and basic partnerships divide the benefits among their members. The division of benefits affects incentives of members. When effort is not observable, the members of a partnership have an incentive to free ride on the efforts of others. The division of benefits divides the marginal return to effort, thus discouraging effort at the margin. When members of the partnership choose efforts noncooperatively, effort levels are below efficient levels. This is referred to as moral hazard in teams.¹⁰⁸

The firm offers mechanisms for reducing free riding in the formation and dissolution of relationships. The firm's organization establishes internal responsibilities and relationships between positions that are separate from the particular people that occupy those positions. Thus, an organization can continue to function with the replacement of

¹⁰⁵ See Gal-Or, E., 1997, "Multiprincipal Agency Relationships as Implied by Product Market Competition," Journal of Economics & Management Strategy, 6, 2, Summer, pp. 235-256.

¹⁰⁶ See Gal-Or, E., 1992, "Vertical Integration in Oligopoly," Journal of Law, Economics, & Organization, 8, pp. 377-393.

¹⁰⁷ See Gal-Or, E., 1993, "Internal Organization and Managerial Compensation in Oligopoly," International Journal of Industrial Organization, 11, pp. 157-183.

¹⁰⁸ See Holmström, 1982, *supra* note 68.

particular individuals employed by the organization. The organization can operate with established relationships that do not need to be reestablished when personnel change. The coordination of organizational transactions by firms helps to explain why firms design, build, and administer organizations.

IV.G Contracting

Contracting costs are the critical determinant of the firm's extent of vertical integration. The traditional explanations for vertical integration can be reexamined from a transaction costs perspective. One explanation for vertical integration is that firms seek to avoid the inefficiencies of double marginalization due to market power at both stages. However, avoiding double markets can be achieved through contracts without the need for vertical integration. The firm can implement marginal cost pricing through lump-sum transfers. Firms will integrate vertically when doing so is less costly than such contracts. Another source of vertical integration is due to economies of combining stages of production. The transaction cost approach emphasizes that separate firms could combine stages of production contractually without vertical integration. For example, auto manufacturers house input suppliers within their plants.

Another traditional explanation vertical integration is to reduce either demand-side or supply-side risk. The transaction cost approach suggests that this problem could also be solved through market contracts, since contracts are ways for parties to share risk. In practice, risk may reduce vertical integration. In franchising, Lafontaine and Bhattacharya find that the risks associated with sales dispersion reduce vertical integration.¹⁰⁹ This may occur because independent units are better at reacting to market conditions. Woodruff suggests that frequent fashion changes reduce vertical integration in the Mexican footwear industry.¹¹⁰

The literature on vertical integration has focused attention on contracting costs that result in "hold-up." Lafontaine and Slade find that studies of backward integration into production tend to be based on

¹⁰⁹ See Lafontaine, F. and S. Bhattacharya, 1995, "The Role of Risk in Franchising," Journal of Corporate Finance, 21, pp. 39-74.

¹¹⁰ See Woodruff, C, 2002, "Non-contractible Investment and Vertical Integration in the Mexican Footwear Industry," International Journal of Industrial Organization, 20, pp. 1197-1224.

contracting cost arguments.¹¹¹ When investments are specific to the contractual exchange and contracts are not fully enforceable, parties to the contract may have an incentive to choose investments below efficient levels. Various types of assets can be specific to contractual relationships, including physical capital and human capital. Building on Coase and Commons, Oliver Williamson views the firm's hierarchy as a means of mitigating enforcement problems in market contracts.¹¹² Williamson observes that firms "organize transactions so as to economize on bounded rationality while simultaneously safeguarding them against the hazards of opportunism."¹¹³ He concentrates on imperfections in market contracts that lead to opportunism, which he defines as "self-interest seeking with guile," resulting in contract renegotiation.¹¹⁴ Numerous empirical studies examine the choice between vertical integration and market contracts.¹¹⁵ The high level of

¹¹¹ See Lafontaine, F. and M. Slade, 2007, *supra* note 95. See also Klein (2005) on empirical analysis of the make-or-buy decision and the survey by Joskow (2005): Klein, P. G., 2005, "The Make-or-Buy Decision: Lessons from Empirical Studies," in Claude Menard and Mary Shirley, eds., Handbook of New Institutional Economics, New York: Springer, pp. 435-64; Joskow, P. L., 2005, "Vertical Integration," in Handbook of New Institutional Economics, Menard, C., and M.M. Shirley, eds., pp. 319-348, Dordrecht: Springer.

¹¹² Williamson, 1975, 1985, *supra* note 6.

¹¹³ See Williamson, 1985, *supra* note 6, at 32.

¹¹⁴ See Klein, B., R. G. Crawford, and A. A. Alchian, 1978, "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," Journal of Law and Economics, 21, October, pp. 297-326; Groot, P. A., 1984, "Investment and Wages in the Absence of Binding Contracts: A Nash Bargaining Approach," Econometrica, 52, March, pp. 449-460; Grossman, S. J., and O. D. Hart, 1986, "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration," Journal of Political Economy, 94, August, pp. 691-719; Hart, O., and B. Holmström, 1986, "The Theory of Contracts," in T. F. Bewley, ed., Advances in Economic Theory Fifth World Congress, Cambridge: Cambridge University Press, pp. 71-155; Hart, O., and J. Moore, 1988, "Incomplete Contracts and Renegotiation," Econometrica, 56, July, pp. 755-785; and Hart, O. D., 1995, Firms, Contracts and Financial Structure, Oxford: Oxford University Press.

¹¹⁵ See for example Masten, S., J. W. Meehan Jr., and E. A. Snyder,

vertical integration exhibited by such firms provides an illustration of the case where the transaction costs of market transactions exceed the transaction costs of organizational transactions, so that many activities are moved within the firm. Many large-scale vertically-integrated manufacturing companies developed in the early part of the twentieth century. According to Alfred D. Chandler, there was extensive vertical integration in American business between 1900 and 1917.¹¹⁶

This development suggests that business executives in many industries anticipated greater returns from internalizing transactions through vertical integration. Henry Ford's slogan was "from mine to finished car, one organization." By 1920, General Motors "had extended its scope so that not only all the engines used in its cars, but a large proportion of such units as gears, axles, crankshafts, radiators, electrical equipment, roller bearings, warning signals, spark plugs, bodies, plate glass, and body hardware, were produced either by a General Motors unit or by a subsidiary."¹¹⁷

Chandler attributes increasing vertical integration to the returns obtained from internalizing the market processes connecting mass production to distribution and to the efficiencies of the "visible hand of administrative coordination." Chandler also notes the desire of companies to assure a more certain supply of parts, raw materials and other supplies.¹¹⁸ Some of the vertical integration may have been due to the high costs of transportation and communication that favored internal provision of critical inputs to the manufacturing process. Extensive vertical integration was observed in the automobile industry as companies sought economies of internal coordination.¹¹⁹ Managers could

1991, "The Costs of Organization," Journal of Law, Economics and Organization, 7(1), Spring, pp. 1-25 on the vertical integration decision in naval shipbuilding, and Monteverde, K. and D. J. Teece, 1982, "Appropriable Rents and Quasi-Vertical Integration," Journal of Law and Economics, 25 (2), October, pp. 321-328 on a limited form of vertical integration in which assemblers of automobiles own specialized equipment used by suppliers.

¹¹⁶ See Chandler, 1977, *supra* note 15, at 34.

¹¹⁷ See Edmonds, C.C., 1923, "Tendencies in the Automobile Industry," American Economic Review, 13, pp. 422-441.

¹¹⁸ See Chandler, A. D., 1962, Strategy and Structure, Cambridge, MA: MIT Press.

¹¹⁹ Miwa and Ramseyer, 2000, find an absence of relationship-specific

choose a variety of mechanisms to allocate resources within the firm. Chandler further observes that the modern multi-unit business arose “when administrative coordination permitted greater productivity, lower cost, and higher profits than coordination by market mechanisms.”¹²⁰

Some economists of the period who observe such increasing vertical integration consider reasons that firms might have for replacing market transactions with organizational transactions. Frank Knight, for example, concludes that “The problem of meeting uncertainty thus passes inevitably into the general problem of management, of economic control.”¹²¹ The firm is organized as a means of mitigating the effects of uncertainty regarding production and final demand. Another economist, Frank goes further, arguing that “coordinated operation calls for the ownership or control by some organization of all other stages” and suggests that “the price system, in so far as it affects the conduct of industry at least, is being rendered obsolete” due to vertical integration.¹²²

The emphasis on vertical integration in business practices and

physical or human capital in the Japanese automobile industry, see Miwa, Y. and J. M. Ramseyer, 2000, “Rethinking Relationship-Specific Investments: Subcontracting in the Japanese Automobile Industry,” Michigan Law Review, Vol. 98, April, pp. 2636-2667. Casadesus-Masanell and Spulber (2000) examine the classic case of vertical integration between General Motors and Fisher Body and find evidence that contract hold-up was not a driver of vertical integration, see Casadesus-Masanell, R., and D. F. Spulber, 2000, “The Fable of Fisher Body,” Journal of Law and Economics, 43, April, pp. 67-104. See also Coase (2000, 2006) correct the historical record of the Fisher Body acquisition as discussed in Klein, Crawford, and Alchian, 1978, *supra* note 112 (Coase, R. H., 2000, “The Acquisition of Fisher Body by General Motors,” Journal of Law and Economics, 43 (1), April, pp. 15-32; and Coase, R. H., 2006, “The Conduct of Economics: The Example of Fisher Body and General Motors,” Journal of Economics & Management Strategy, 15 (2), Summer, pp. 255-278).

¹²⁰ Chandler, 1977, *supra* note 15, at 6. See also Williamson, O. E., 1970, Corporate Control and Business Behavior, Englewood Cliffs, NJ: Prentice-Hall.

¹²¹ See Knight, 1971, *supra* note 6, at 259.

¹²² See Frank, L. K., 1925, “The Significance of Industrial Integration,” Journal of Political Economy, 33, April, pp. 179-195.

economic analysis at the start of the twentieth century may have been due in part to a distrust of markets. There was an early fascination with planned economies that existed long before the collapse of the Soviet Union would demonstrate the drastic inefficiencies of such systems. Planned economies attempted to supplant the market by vertical integration of the entire economy through trade ministries that allocated inputs and directed production.¹²³ From 1928 on “the Soviet manufacturing industry operated within the framework set by detailed central directives enforced and supervised by the party and by a hierarchical, complex planning and managerial administration.”¹²⁴ The distinction between the division of labor in markets and within firms that appears in Karl Marx dates back to the classical economists such as Adam Smith.¹²⁵

Alfred P. Sloan’s 1919 study of the organization of General

¹²³ Central planning in the Soviet economy reflected the Marxist view that just as factories organized production, the government could replace the market: “Anarchy in social production is replaced by systematic definite organization” (Engels, F., 1989, Socialism: Utopian and Scientific, New York: Pathfinder Press). Such a view carried over into industrial organization in planned economies. Enterprises strived for all-embracing vertical integration and staggering size, known as gigantism. Reflective of this approach, the former Soviet Union “constructed the most enormous hydro-electric dam, the roomiest hotel, the tallest TV tower, the largest transport plane, the heaviest battle tank, and the mightiest particle accelerator. A popular joke from the 1980s went that the Soviet computer industry produced ‘the world’s biggest microchip.’” Such gigantism persisted until the collapse of the Soviet Union: “The world’s largest building, according to the Guinness Book of Records, is workshop no. 55 here at Sevmash, an off-limits shipyard in Russia’s far north that built some of the biggest submarines, including the ill-fated Kursk. Everything about this sprawling city-within-a-city, with 25,000 workers and dozens of huge workshops and floating docks, seems vastly outsized,” Fred Weir, “Kursk Recovery May Salvage Russian Shipyard, too,” Christian Science Monitor, August 3, 2001.

¹²⁴ See Spulber, N., 2003, Russia’s Economic Transitions: From Late Tsarism to the New Millennium, Cambridge: Cambridge University Press, at 224.

¹²⁵ Marx, K., 1992, Capital: A Critique of Political Economy, New York: Penguin Classics.

Motors was adopted as a plan of reorganization for the company the following year. The plan, which was to become influential for the organization of large-scale companies, sought to bring some central coordination to the very decentralized General Motors company. Sloan's book about General Motors, completed in 1954, emphasizes the importance of determining the rate of return to individual divisions as a guide to the corporation's strategic investment decisions.¹²⁶ Sloan sets out general principles that recognize the tradeoffs between central control of the company by the chief executive officer and independence of the company's divisions. The decentralizations carried out by General Motors and by du Pont in the 1920s are important to the history of management because they represent attempts to address management incentives and performance through changes in organizational design.

The later twentieth century and early part of the twenty-first century saw significant reduction of vertical integration in many industries in industrialized market economies. Automobile companies for example divested their parts manufacturing units. Diverse industries such as computer manufacturing had separate firms manufacturing individual components with other firms specializing in assembly and distribution. The period also witnessed increased reliance on outsourcing both domestically and through international trade. In business practice, there was less emphasis on the notion that firms exist solely to replace markets with organizations, and greater emphasis on lowering market transaction costs.

These developments coincided with reductions in the costs of both market transactions and organizational transactions. Technological developments dramatically improved information processing, communications and transportation. Lower transaction costs may have reduced the impetus for vertical integration and helped establish new forms of economic exchange. The functions and tasks of management changed but by no means reduced the need for firms. Rather, these economic developments highlighted the dual nature of firms in managing both market transactions and organizational transactions.

The vertical integration of the early twentieth century has given way to vertical disintegration through outsourcing and specialized intermediaries. Some manufacturers are primarily engaged in transactions and maintain minimal manufacturing operations. For

¹²⁶ Sloan, Jr., A. P., 1963, My Years with General Motors, New York: Doubleday.

example, Dell Computer is classified as a manufacturer of computer equipment but is primarily a direct marketer of computers, relying on other companies for distribution, assembly, software, hardware components, and design. Original equipment manufacturers (OEMs) often outsource manufacturing to companies that organize supply chains and handle contract manufacturing. In electronics, many OEMs who supply electronics products rely on supply-chain managers, such as Flextronics, which in turn subcontract with many different smaller manufacturers. Fashion companies outsource production to specialized supply-chain managers such as Li & Fung.

The reduction of vertical integration was accompanied by a greater focus on the efficiency of market transactions. The role of firms in creating and coordinating transactions is particularly apparent in the retail, wholesale and financial sectors. Firms in these sectors account for approximately a quarter of gross domestic product in the United States.¹²⁷ Retailers are intermediaries between final consumers and wholesalers and manufacturers. Two thirds of wholesale transactions are sales made by wholesale merchants (including also distributors, jobbers, drop shippers, import/export merchants, grain elevators and farm product assemblers), and agents (including also brokers, commission merchants, import/export agents and brokers, auction companies, and manufacturers' agents). The remaining third of wholesale transactions are sales conducted through manufacturers' sales branches and offices to wholesalers, retailers and other manufacturers (U.S. Census Bureau, 2000). Financial firms, including banks, securities brokerages, mutual funds and insurance companies, also primarily create transactions. Others engaged in intermediation activities include attorneys, sales agents, real estate brokers and other specialized agents. All types of companies, including manufacturing firms, spend substantial resources on transactions through their marketing and sales, input purchasing, financing and other market functions. Transaction activities are an essential part of the establishment and operation of firms.

V. COMPARISON WITH ALTERNATIVE DEFINITIONS OF THE FIRM

It is worthwhile to contrast the general theory of the firm, based on the separation criterion, with the main economic views of the firm.

¹²⁷ See Spulber, D. F., 1996, "Market Microstructure and Intermediation," Journal of Economic Perspectives, volume 10, Summer, pp. 135-152.

There are many aspects in common and some key differences. The traditional economic concept of the firm, known as the neoclassical firm defines the firm by its production technology. The neoclassical firm is distinguished from the household because the household does not engage in production.¹²⁸ The description of the firm is an engineering conception of a mechanism for transforming inputs into outputs. To this, neoclassical economics adds the requirements that the firm takes prices as givens and chooses inputs to minimize costs. This view underpins the benchmark of the “perfectly competitive” firm. Against this benchmark, firms that adjust their prices must have monopolistic market power, even though in practice practically all firms are able to adjust their prices. Although the perfect competition benchmark is fundamentally inconsistent with such normal pricing behavior, departures from competitive pricing are used to justify regulation and antitrust scrutiny. In addition, the neoclassical benchmark ignores various activities of the firm including marketing and management.

The neoclassical firm is an ideal case rather than an accurate description of the firm. In practice, firms tend to have the power to adjust their own prices, even in highly competitive markets. The firm is much more than a production technology, including such functions as management and marketing. As Schumpeter notes, the general equilibrium perspective does not include entrepreneurship and innovation.¹²⁹ The point of departure between the present discussion and the neoclassical perspective is that firms are no longer defined by their production technology. Production technology is just that, and individuals acting together or in concert can operate the production technology, thus eliminating the neoclassical distinction between the firm and the household. The general theory of the firm bases the definition of the firm on its ability to carry out transactions and the separation criterion.

The industrial organization conception of the firm recognizes that firms engage in strategic competition, adjusting prices and product features. This approach continues to view the firm as a production technology, often characterized by economies of scale, but also characterizes the firm as a strategic player and innovator. This approach is associated with the rule of reason approach to antitrust rather than per se prohibitions, particularly regarding vertical restraints. The rule of

¹²⁸ See Arrow and Hahn, 1971, *supra* note 6.

¹²⁹ Schumpeter, 1997 [1934], *supra* note 12.

reason looks at the competitive behavior of firms rather than deducing their competitiveness by a simple analysis of market structure.¹³⁰

The most important precursor of our analysis is that of Ronald Coase, who emphasizes that the boundaries of the firm are determined by the transaction costs of using the market in comparison with the firm's internal costs.¹³¹ Coase states that "a firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing in another firm."¹³²

Coase emphasizes that firms engage in economic planning within the organization. As Coase points out: "Marshall introduces organization as a fourth factor of production; J. B. Clark gives the co-ordinating function to the entrepreneur; Knight introduces managers who co-ordinate. As D. H. Robertson points out, we find 'islands of conscious power'." Focusing on the firm's internal activities (rather than on its external activities), Coase asserts that "the distinguishing mark of the firm is the supersession of the price mechanism" and assigns organizational activities to the entrepreneur-coordinator. In the general theory of the firm presented here, the firm's external market-making activities also reflect conscious power and coordination.

A restrictive application of transaction cost economics associated with Oliver Williamson builds on Coase's contrast between markets and the firm's internal allocation.¹³³ This approach limits the specification of transaction costs contractual hold-up. A closely-related view of the firm explains vertical integration based on the consolidation of ownership of productive assets.¹³⁴ Firms own assets to mitigate the effects of incomplete contracting and asset specificity. They argue that ownership of productive assets improves incentives for investment in complementary transaction-specific capital, such a human capital. For Hart, "ownership is a source of power when contracts are incomplete."¹³⁵

¹³⁰ See for example Bork, R. H., 1978, The Antitrust Paradox, and Posner, R. A., 1979, "The Chicago School of Antitrust," 127 University of Pennsylvania Law Review, 925.

¹³¹ See Coase, 1937, 1988, 1994, supra note 6.

¹³² See Coase, 1937, supra note 6.

¹³³ See Williamson, 1975, 1985, supra note 6.

¹³⁴ See Grossman and Hart, 1986, supra note 112; Hart and Moore, 1990, supra note 6; and Hart, 1995, supra note 112.

¹³⁵ See Hart, 1995, at 29.

Holmström and Roberts point out that property rights to assets are not sufficient to explain the boundaries of the firm since market contracts can be created that replace many of the functions of vertical integration.¹³⁶ They find that contracts in the market place can allocate decision rights thus achieving the same results as the consolidation of asset ownership. The firm thus chooses between market contracts and internal transactions for many reasons other than asset ownership.

The contractual theory views the firm as a “nexus of contracts.” The contractual theory has heavily influenced the study of corporate law and regulation.¹³⁷ The contractual theory of the firm accurately observes that the firm enters into contracts with many individuals. The firm contracts with its managers, workers, customers, suppliers, and partners. The firm also contracts with its investors, issuing various types of securities such as stocks, bonds, promissory notes, and debentures.

The contractual theory of the firm focuses on incentives for performance of employees and managers.¹³⁸ As a consequence of asymmetric information, contracts are subject to problems of moral hazard and adverse selection. These costs can be mitigated by monitoring and coordination. Firms reduce contracting costs when they can improve contract design, monitoring, and coordination.

Armen Alchian and Harold Demsetz explain the purpose of the firm based on the difficulties of monitoring team production.¹³⁹ They describe the firm as a form of contract, with the owner as the centralized contracting actor for the team. They suggest that self-monitoring partnerships will arise when team production requires artistic or

¹³⁶ See Holmström, B., and J. Roberts, 1998, “The Boundaries of the Firm Revisited,” Journal of Economic Perspectives, 12, 4, Fall, pp. 73-94.

¹³⁷ See Jensen and Meckling, 1976, supra note 6; Fama, E. F., and M. C. Jensen, 1983a, “Separation of Ownership and Controls,” Journal of Law and Economics, 26, June, pp. 301-325; Fama, E. F., and M. C. Jensen, 1983b, “Agency Problems and Residual Claims,” Journal of Law and Economics, 26, June, pp. 327-349; Esterbrook, F. H., and D. R. Fischel, 1989, “The Corporate Contract,” Columbia Law Review, 89, pp. 1416-1448; Esterbrook, F. H., and D. R. Fischel, 1991, The Economic Structure of Corporate Law, Cambridge, MA: Harvard University Press.

¹³⁸ See Knight, 1971, supra note 6; Alchian and Demsetz, 1972, supra note 6; and Holmström, 1999, supra note 6.

¹³⁹ See Alchian and Demsetz, 1972, supra note 6.

professional skills and when there are few partners. Firms require a residual claimant as the central monitor. Firms emerge when the cost of managing the team's inputs is less than the cost of metering marginal outputs. The firm's owners are themselves monitored because they are residual claimants to the firm's profit, which is in turn subject to the discipline of the market. Alchian and Demsetz observe that the organizational structure of firms (sole proprietorship, partnership, and corporation) provides alternative ways to monitor team production.

Holmström emphasizes the firm's role as a designer of incentives rather than as a monitor.¹⁴⁰ As a residual claimant, the firm can employ incentive mechanisms that are not subject to budget-balancing constraints that are faced by partnerships. Although mechanisms such as penalties and rewards work well under certainty, this need not hold under uncertainty. When outcomes are subject to shocks, the efficacy of such schemes is constrained by limits on the liability of either the principal or of the agents in the team.¹⁴¹

Transaction cost economics in its various forms has had a substantial influence on jurisprudence. Its influence continues in the decisions of the Roberts Court.¹⁴² Transaction cost economics views the boundaries of firms as the result of decisions to vertically integrate productive activities to avoid the alternative of costly market contracts. The "Chicago School," which describes a combination of the industrial organization and transaction-cost approaches to public has been highly influential.¹⁴³ A competing approach, sometimes referred to as the "Post-

¹⁴⁰ See Holmström, 1982, *supra* note 68. Holmström (p. 328) states that "The primary role of the principal is to administer incentive schemes that police agents in a credible way rather than to monitor agents as in Alchian and Demsetz' story."

¹⁴¹ The firm's ability to use such incentive mechanisms is limited by its ability to make credible commitments, as Innes (1990) points out for the standard principal-agent framework. See Innes, R. D., 1990, "Limited Liability and Incentive Contracting with Ex-ante Action Choices," *Journal of Economic Theory*, 52, pp. 45-67.

¹⁴² See Joshua D. Wright, 2009, "The Chicago School, Transaction Cost Economics, and the Roberts' Court's Jurisprudence," *George Mason Law & Economics Research Paper No. 08-33*, *The Elgar Companion to Transactional Cost Economics*, Peter G. Klein, Michael E. Sykuta, eds., Edward Elgar Publishing, Forthcoming.

¹⁴³ See Posner, 1979, *supra* note 128; Page, W. H., 1989, "The Chicago

Chicago School,” applies game-theoretic tools to classify various competitive strategies of firms as anticompetitive. The “Post-Chicago School” suggests market conditions that justify antitrust enforcement and regulation. The “Chicago School” and the “Post-Chicago School,” whatever their policy differences, share a common view of the firm based on industrial organization and transaction cost economics. Joshua Wright finds that the “Chicago School’s” influence dominates that of the “Post-Chicago School” in the Roberts Court. He points out the Court’s decisions in *Leegin Creative Leather Products, Inc. v. PSKS, Inc.* (2007), regarding resale price maintenance and *Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co.* (2007), regarding predatory pricing, and *Bell Atlantic Corp. v. Twombly* (2007), regarding exclusive territories.¹⁴⁴

The general theory of the firm based on the separation criterion is consistent with the various transaction-cost views of the firm. The transaction costs views of the firm explain the firm’s choice between market transactions and organizational transactions. The general theory of the firm presented here includes various explanations for the internalization hypothesis, including bargaining costs, search costs, moral hazard, adverse selection, hold-up, and free riding. The relative importance of these transaction costs requires empirical investigation.

The general theory of the firm based on the separation criterion goes beyond existing analyses of the firm by explaining why firms exist, and addressing what is their economic role. Firms exist to improve transaction efficiency relative to direct exchange between consumers. The presence of transaction costs not only explains the boundaries of the firm’s organization, but also the scope of the firm. The firm’s scope combines its market and organizational activities. The intermediation hypothesis suggests that the firm provides a combination of market

School and The Evolution of Antitrust: Characterization, Antitrust Injury, and Evidentiary Sufficiency,” 75 *Virginia Law Review*, 1221; Kovacic, W. E. and C. Shapiro, 2000, “Antitrust Policy: A Century of Economic and Legal Thinking,” 14 *Journal of Economic Perspectives*, pp. 43-60; Baker, J. B., and T. F. Bresnahan, 2006, ‘Economic Evidence in Antitrust: Defining Markets and Measuring Market Power’, Stanford Law School, Working Paper No. 328, July.

¹⁴⁴ See Wright, 2009, *supra* note 140. See also Joshua D. Wright, 2007, “The Roberts Court and the Chicago School of Antitrust: The 2006 Term and Beyond,” *Competition Policy International*, vol. 3, pp. 24-57.

transactions and organizational transactions to improve economic efficiency. The relative importance of particular transaction costs in determining the scope of the firm is again a matter for empirical determination.

VI. IMPLICATIONS OF THE SEPARATION THEORY OF THE FIRM FOR CORPORATE LAW

The separation theory of the firm has important implications for the analysis of corporate law. The separation theory of the firm places emphasis on the full range of transaction costs faced by owners of the firm. Many of these transaction costs should be approached within the context of property rights. This extends and supplements the contractarian approach to corporate law, which places emphasis on the transaction costs of contracting with the firm's managers.

The contractarian analysis of corporate law devotes considerable attention to agency costs, that is, the transaction costs of delegating authority to managers. The firm incurs agency costs in the form of shirking by managers, inaccurate reporting of information by managers, and managerial rent seeking.¹⁴⁵ Managerial rent seeking can be interpreted within the contractual framework as breaches of the duties of care and loyalty. The firm incurs costs of providing incentives for managers and in monitoring management performance. This view of corporate law emphasizes the potential for managers to evade supervision by the board of directors and by shareholders so as to increase their compensation and disguise bad managerial decisions. Based on this approach, public policy is directed at increasing the power of shareholders and corporate boards relative to management.

The separation theory of the firm has important implications for the economic analysis of corporate law. The separation theory of the firm more clearly identifies the objectives of the corporation and those of the

¹⁴⁵ See for example Bebchuk, Lucian Arye, Jesse M. Fried and David I. Walker, 2002, "Managerial Power and Rent Extraction in the Design of Executive Compensation," University of Chicago Law Review, 69:3, pp. 751–846. See also Shleifer, Andrei and Robert Vishny, 1989, "Management Entrenchment: The Case of Manager-Specific Investments." Journal of Financial Economics, 25:1, pp. 123–140 and Shleifer, Andrei and Robert Vishny, 1997, "A Survey of Corporate Governance." Journal of Finance, 52:2, pp. 737–783.

firm's shareholders. Corporate law provides a template that improves the efficiency of transactions associated with the exercise of property rights by the firm's owners. Corporate law provides a context for corporate governance by the firm's shareholders, corporate directors, and managers. Additionally, corporate law provides a framework for the market for corporate control.

VIA. Property Rights

The separation theory of the firm highlights the connection between corporate law and the property rights of investors. Corporate law seeks to improve transaction efficiencies by providing a standard legal form.¹⁴⁶ Among the features of the standard form are the delegation of authority by shareholders to management and delegation of monitoring to a board of directors. The standard form also has implications for owners' rights to residual returns and rights of residual control.

It is generally recognized that securities involve both contract rights and property rights. Contract rights and property rights reflect different regulatory strategies.¹⁴⁷ These rights derive from investor ownership of the corporation's securities. Many features of the standard corporation have a distinct property rights flavor. Investors have ownership rights that entitle them to receive the firm's residual returns. Investors' ownership rights also give them residual rights of control over the firm. Investor's ownership rights are complete, exclusive, and

¹⁴⁶ See Easterbrook, F. H., and D. R. Fischel, 1991, The Economic Structure of Corporate Law, Cambridge, MA: Harvard University Press; and Ribstein, 2004, *supra* note 29.

¹⁴⁷ For a discussion distinguishing contracts rights from property rights, see Merrill, Thomas W. and Smith, Henry E., "The Property/Contract Interface," Columbia Law Review, Vol. 101, pp. 773-852, May 2001. They argue that "In personam contract rights and in rem property rights can be seen as two different strategies for regulating the use of resources," at 790, with in personam contract rights used for governance and in rem rights used for exclusion. See also Thomas W. Merrill and Henry E. Smith, "What Happened to Property in Law and Economics?" Yale Law Journal, Vol. 111, No. 2, November, 2001, pp. 357-398. On implications for monitoring by investors, see Thomas H. Jackson and Anthony T. Kronman, 1979, "Secured Financing and Priorities Among Creditors," Yale Law Journal, Vol. 88, pp. 1152-1161.

transferable. Although financial contracts are tradable, as is the case with futures and options, the transferability of corporate securities corresponds closely with the transfer of ownership. Investor's limited liability can be examined within the context of property rights.

The separation criterion approach is consistent with many of the conclusions of the contractarian perspective. The separation criterion approach views the organizational and contractual structure of the firm as the result of the same competitive market forces. The contracts and ownership structure of the newly-established firm reflects agreements between the entrepreneur and the firm's investors.¹⁴⁸ The contracts and ownership structure of existing firms reflect voluntary agreements involving investors, owners, directors, and managers.

The contractarian approach to corporate law emphasizes the contracts between the firm and its directors and managers.¹⁴⁹ These contracts provide incentives to directors and managers to act in the interests of shareholders. Asymmetries in information lead to problems of moral hazard and adverse selection that can cause the interests of directors and managers to depart from those of shareholders.

The separation approach emphasizes the property rights of the corporation's shareholders. Application of the separation criterion implies that the corporation should be structured to improve the ability of owners to maximize the income that they receive from their share of the firm's residual returns. The corporation also should be structured to improve the ability of its owners to delegate authority to management and to exercise rights of residual control. The corporation's rules apply to voting, the corporate board, sale of securities, disclosure of information, and the settlement of claims resulting from financial distress.

VIB. Corporate Governance

The separation theory of the firm distinguishes the institution's objectives from the consumption objectives of its owners as well as from those of other parties that contract with the firm. This differs from the contractarian perspective in which the firm's objectives emerge from the

¹⁴⁸ Easterbrook and Fischel, 1991, at 5 point out that "In establishing the firm, the entrepreneur faces two important questions: "what promises to make" and "how to induce investors to believe them."

¹⁴⁹ See Jensen and Meckling, 1976, *supra* note 6; and Easterbrook and Fishel, 1991.

collection of voluntary contracts between many individuals. Corporate law should facilitate organizational forms that carry out the separation of the firm's objectives from the consumption objectives. If individuals wish to establish an organization such as a club or workers' cooperative that does not separate these objectives, they can pursue organizational forms that differ from the corporation.

The contractarian firm is a "nexus of contracts," whose objectives are those of all of the parties to its various contracts. Easterbrook and Fischel point out that the contractual approach "does not draw a sharp line between employees and contributors of capital."¹⁵⁰ Easterbrook and Fischel argue that the maximand of the corporation is the result of contractual choices, which reflect private contractual agreements.¹⁵¹ Because they are voluntary, these agreements necessarily seek to achieve gains from trade for the participants. Corporate law should be neutral with regards to the firm's objective to the extent that the firm's maximand is the outcome of market forces. Based on this approach, Easterbrook and Fischel suggest that the role of corporate law is "to provide a background term that prevails unless varied by contract,"¹⁵²

"An approach that emphasizes the contractual nature of the corporation removes from the field of interesting questions one that has plagued many writers: what is the goal of the corporation? Is it profit, and for whom? Social welfare more broadly defined? Is there anything wrong with corporate charity? Should corporations try to maximize profit over the long run or the short run? Our response to such questions is: who cares?"¹⁵³

However, this begs the question of why corporate law is needed to supplement contract law.

Corporate law should perhaps provide more guidance. There are many possible "background terms" that are consistent with freedom of contract. The separation criterion definition of the firm presented goes beyond the contractual view by addressing the maximand of the corporation. The firm's maximand need not be profit maximization but it should be distinct from that of its owners. The corporation should not be

¹⁵⁰ Easterbrook and Fischel, 1991, *supra* note 144, at 37.

¹⁵¹ Easterbrook and Fischel, 1991, *supra* note 144.

¹⁵² Easterbrook and Fischel, 1991, at 36.

¹⁵³ Easterbrook and Fischel, 1991, at 35-36.

a mechanism for providing consumption benefits to its owners, either in the form of lower prices for owners who are buyers or higher payments and perks for owners who are managers and employees.

The separation theory of the firm characterizes the institution as a distinct economic actor that pursues objectives. The firm is defined by the ability to separate the objectives of the institution from the consumption objectives of its owners. Satisfying the separation criterion generally implies but does not require profit maximization. Corporate law recognizes that the firm pursues its own objectives with management acting under authority delegated by its owners.

The separation criterion view draws a distinction between employees and providers of capital. This does not mean that such a distinction should be enforced by law, since contracts are voluntary. Rather, the corporate form should recognize the need to separate the firm's maximand from that of its owners, whether these are investors or employees. If the owners of the firm do not wish to make such a separation, then they should choose to adopt other institutional forms, such as cooperatives or nonprofits, which have different background terms.

The separation theory of the firm suggests that corporate law provides "standard terms" that facilitate corporate governance. The firm's owners seek to maximize their net income, which reflects their residual claims net of the transaction costs of exercising property rights. Corporate governance involves more than the costs of delegating authority to the firm's managers. Corporate governance rules affect the residual returns and the transaction costs associated with conflict between shareholders, between shareholders and the board, between shareholders and management. Corporate governance rules additionally recognize the benefits to shareholders of delegating authority to the corporation's board and to managers, including limited expertise of shareholders and the opportunity costs of shareholders' time.

VIC. The Market for Corporate Control

Corporate law provides "standard terms" to the market for corporate control. The separation theory of the firm places emphasis on property rights that are the foundation of securities markets. The firm's owners sell securities that provide rights to residual returns and residual control. By setting rules for disclosure of information, mergers and acquisitions, and takeovers, corporate law affects transaction costs in the market for securities. When securities markets function efficiently,

securities prices reflect the information about the future performance of companies.

Limited liability is a key aspect of corporate law.¹⁵⁴ The separation criterion helps to explain the importance of limited liability. When separation holds, limited liability means that only the value of their investment affects the consumption and savings decisions of the firm's owners. With separation, limited liability thus implies that the firm's owners want managers to maximize the value of the firm. With separation, limited liability allows the formation of a market for securities.

Margaret Blair points out that corporate law performs an important function by giving the firm entity status through the separation of ownership and control.¹⁵⁵ Corporate law provides incentives for the firm to accumulate enterprise-specific physical capital, organizational capital, and human capital.¹⁵⁶ The entity perspective emphasizes that the firm has value as an ongoing concern. The separation of ownership and control provided by corporate law allows investors to withdraw capital without necessarily blocking the continued operation of the firm. Also, managers can withdraw from the firm without necessarily changing its continued operation. Investors and managers need not have their decisions dependent on how their withdrawal affects the survival of the

¹⁵⁴ Easterbrook and Fischel, 1991, at 40, state that limited liability is “perhaps *the* distinguishing feature of corporate law.” However, as they recognize limited liability also applies to debt investors in sole proprietorships, general or limited partnerships, business trusts and other ventures. They further recognize limited liability holds for equity investors in limited partnerships and business trusts, and limited liability applies to employees and other contributors of human capital for any organizational form.

¹⁵⁵ See Blair, M. M., 2003, “Locking in Capital: What Corporate Law Achieved for Business Organizers in the Nineteenth Century,” *UCLA Law Review*, 51, pp. 387-455; and Blair, M. M., 2004, “The Neglected Benefits of the Corporate Form: Entity Status and the Separation of Asset Ownership From Control,” in *Corporate Governance and Firm Organization: Microfoundations and Structural Forms*, Oxford University Press, pp. 45-66.

¹⁵⁶ See Blair, M. M., 1995, *Ownership and Control: Rethinking Corporate Governance for the Twenty-First Century*, Washington, DC: Brookings Institution; Blair, 2003 and 2004, *supra* note 152.

entity as in the case of the basic partnership.

The question of separation of ownership and control has generated some controversy. Although corporations are the main form of organization in developed economies they have traditionally been the object of criticism. Adam Smith observed that directors of joint-stock companies

“being the managers rather of other people’s money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. ... Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company.”¹⁵⁷

The inefficiencies of the corporate form are a frequent theme in the economics, finance, and law literatures. A large literature on corporate governance offers myriad suggestions for private reforms and public regulation.¹⁵⁸

In their classic study, Adolf Berle and Gardiner Means expressed concern that the separation of ownership and control would replace efficient markets with inefficient corporations.¹⁵⁹ They argued that dispersed ownership would lead to a divergence, and even opposition, of interests between owners and managers and also noted the general absence of dominant shareholders. Berle and Means argued that diffuse ownership reduced the incentives for shareholders to monitor management in comparison to a closely-held company. For Berle and Means, this situation represented a corporate revolution that outdid the effects of the industrial revolution. Because of the separation of ownership and control, the management of corporations exercised significant autonomy and consequently might not maximize profit. Means indeed attributed the Great Depression to the corporate revolution, which in his view led to inflexible “administered prices.”

¹⁵⁷ Smith, A., 1998 [1776], An Inquiry Into the Nature and Causes of the Wealth of Nations, Washington, D.C.: Regnery Publishing, at 850.

¹⁵⁸ See, for example, Blair, 1995, supra note 153; and MacAvoy and Millstein, 2004, supra note 2.

¹⁵⁹ See Berle, A. A., Jr., and G. C. Means, 1932, The Modern Corporation and Private Property, New York: Commerce Clearing House.

Administrative action by managers replaced market forces in determining prices, “thus inhibiting any general fall in the price level and converting a general fall in demand into a recession and unemployment.”¹⁶⁰ Corporate scandals have led to public policy debates regarding the efficiency of the corporate form. Regulation by the Securities and Exchange Commission and laws such as the Sarbanes-Oxley Act reflect these continued concerns.

The Berle and Means view is inconsistent with the success of the corporate form of organization of the firm. As Jensen and Meckling observe, “Whatever its shortcomings, the corporation has thus far survived the market test.”¹⁶¹ Contrary to Berle and Means, Demsetz and Lehn find no correlation between accounting profits and concentration of ownership.¹⁶² Corporations attract large amounts of investment and

¹⁶⁰ See Means in the introduction to Berle, A. A., Jr., and G. C. Means, 1967, The Modern Corporation and Private Property, Revised edition, New York: Harcourt, Brace & World. See also Means Means, G. C., 1934, “The Consumer and the New Deal,” The Annals of the American Academy of Political & Social Science, 173, May, pp. 7-17; Means, G. C., 1935, “The Major Causes of the Depression,” in F. S. Lee and W. J. Samuels, eds., 1992, Heterodox Economics of Gardiner C. Means: A Collection, Armonk, NY: M. E. Sharpe, Inc., pp. 73-92; Means, G. C., 1939, The Structure of American Economy, Washington, DC: National Resources Committee, Reprint 1966, New York: Augustus M. Kelley Publisher; and Means, G. C., 1940, “Big Business Administered Prices, and the Problem of Full Employment,” The Journal of Marketing, 4, pp. 370-381.

¹⁶¹ Jensen and Meckling, 1976, *supra* note 6, at 357.

¹⁶² See Demsetz, H. and K. Lehn, 1985. “The Structure of Corporate Ownership: Causes and Consequences,” Journal of Political Economy, 93(6), December, pp. 1155-1177. In response to the Berle and Means argument, Demsetz points out that the firm’s owners have an incentive to align the managers’ interests with their own, including giving ownership shares to management, see Harold Demsetz, 1983, “The Structure of Ownership and the Theory of the Firm,” Journal of Law and Economics, 26, June, pp. 375-390. Ruback and Jensen (1983) point out that the market for corporate control involves not only competition between potential owners of the firm, but also competition between potential managers for the opportunity to manage corporate resources, see Ruback, R. S. and M. C. Jensen, 1983, “The Market for Corporate

remain the dominant form of organization for firms. The fact that corporations are the main form of business organization strongly suggests that they provide greater economic benefits than other institutional arrangements.

Jensen and Meckling, based on the principal-agent model, emphasize the effects of incentives on the performance of managers.¹⁶³ As the agent of the corporation's shareholders, the manager is subject to moral hazard. If the manager has a substantial ownership share, the manager will be overly cautious and will avoid risky projects that might increase the firm's expected value. If the manager has a small ownership share, the manager may shirk in terms of insufficient effort or in terms of excessive perks. The manager's actions may depart from the interests of shareholders in various ways. The manager may not devote sufficient effort to his tasks, the manager may not accurately share information with owners, the manager may have a time horizon that is too short, the manager may avoid risk, and the manager may overinvest in the firm's activities rather than distributing returns to shareholders.¹⁶⁴

Following the contracts perspective, Easterbrook and Fischel recommend that courts be guided by an implicit but efficient contract in which the firm's owners seek jointly to maximize their wealth.¹⁶⁵ Fischel argues that courts should be guided by the role of the manager as a fiduciary, that is, the manager is guided by the duties of loyalty and care.¹⁶⁶ He observes that "optimal fiduciary duties should approach the

Control: The Scientific Evidence," Journal of Financial Economics, 11, pp. 5-50. They show empirically that corporate takeovers generate gains from trade, both for target shareholders and acquiring firm shareholders, and that these gains come from efficiency rather than market power.

¹⁶³ See Jensen and Meckling, 1976, *supra* note 6. For additional discussion of the agency approach to corporate governance see Indraneel Chakraborty, 2007, "Heterogeneity in Corporate Governance: Theory and Evidence," University of Pennsylvania, Wharton School, Finance Department, <http://ssrn.com/abstract=1031700>.

¹⁶⁴ See Henry Butler, 1989, "Contractual Theory of the Corporation," George Mason University Law Review, 11, pp. 99-123.

¹⁶⁵ See Easterbrook, F. H., and D. R. Fischel, 1989, "The Corporate Contract," Columbia Law Review, Vol. 89 No.7, pp. 1418, and Easterbrook and Fischel, 1991, *supra* note 144.

¹⁶⁶ See Fischel, D. R., 1982, "The Corporate Governance Movement," Vanderbilt Law Review, 38, pp. 1259-1292.

bargain that investors and managers would reach if transaction costs were zero.”¹⁶⁷ However, Easterbrook and Fischel observe that “Fiduciary principles are uncommon in contractual relations.”¹⁶⁸ This suggests that the contractual analysis of corporate law cannot fully explain the fiduciary principles applied to management.

The restrictions on the actions of CEOs in Sarbanes-Oxley reflect the agency perspective on the firm. For example, the act requires CEOs to certify the information their firm’s financial statements provide to investors. The act provides a regulatory solution that attempts to enforce the manager’s duties of loyalty and care. This approach places emphasis on the firm’s agency contract with management. The agency approach seeks to mitigate the transaction costs of monitoring and rewarding the CEO.

The transaction costs of delegating authority to management are only one aspect of corporate governance, there are also benefits from delegation. Legal measures such as Sarbanes-Oxley are designed to reduce shirking and misrepresentation by management. Focusing legal measures on management performance may serve to raise the costs of delegation without necessarily reducing malfeasance. When firms encounter higher costs of delegation, they may not be able to capture the benefits of delegation. Firms may design organizations to avoid onerous

¹⁶⁷ See Fischel, 1982, at 1265. Kornhauser (1989, p. 1449) finds that contracts and trust offer two metaphors for understanding corporations that “lead us awry or abandon us altogether through ambiguity.” Kornhauser argues that the contracts view is problematic because in practice there are transaction costs and information asymmetries in contracting (see Kornhauser, L. A., 1989, “The Nexus of Contracts Approach to Corporations: A Comment on Easterbrook and Fischel, Columbia Law Review, 89, pp. 1449-1460). He adds that trust falls short because of the multitude of corporate principals including directors, shareholders, and bondholders, who have conflicting interests. Kornhauser argues for mandatory rules that restrict the types of bargains parties can strike when the corporation is formed, thus allocating rights over the life of the corporation. This approach would complement trust as a means of reducing contracting costs. Butler, 1989, supra note 161, points out that corporate owners and managers will find the optimal mix of market and legal restraints on agency costs through direct negotiation of contracts and through the market for corporate control.

¹⁶⁸ See Easterbrook and Fischel, 1991, supra note 144, at 90.

compliance costs and in the process reduce the delegation of authority.

Corporate law should also recognize the benefits of delegating authority to management. The benefits include the development of management expertise from specialization and the division of labor, avoiding the opportunity costs of involving owners in management decisions, and the ability of managers to respond flexibly to market and technological contingencies. Delegating authority to provides efficiency gains from diffuse ownership, including the liquidity of financial markets and the ability of investors to diversify their risk by holding many securities in their portfolios.

Delegation of authority to a manager also allows the owners of a corporation to benefit from unity of control. The manager of the firm can respond flexibly and quickly to market conditions. Unity of control avoids the high transaction costs, the possibility of conflicts, and the likely free riding that would prevent large groups of shareholders from making management decisions. Shareholder voting applies to broad resolutions on proposals made the corporate board rather than detailed management activities.

The separation of the corporation's objectives from the consumption objectives of its owners provides a basis for the market for corporate control. The market for securities provides performance incentives for managers because investors can acquire the firm and replace managers that do not perform well. Performance incentives from the market for corporate control supplement contractual incentives for managers.

VII. CONCLUSION

The firm is a transaction institution whose objectives differ from those of its owners. The general theory of the firm provides a unified framework for studying firms, markets, and organizations. The firm's activities efficiently combine market mechanisms and organizational mechanisms. The scope of the firm is the full range of its market transactions and organizational transactions. The economic equilibrium involves the endogenous choice of consumers to become entrepreneurs. This leads to the endogenous establishment of firms. By creating and managing markets and organizations, firms help to determine the equilibrium prices and allocation of resources in the economy.

Coordination of transactions is central to the theory of the firm. Entrepreneurs establish firms and transact through firms when doing so

enhances the benefits of transactions net of the costs of transactions. Firms create value by making possible transaction efficiencies that consumers could not realize through direct exchange and consumer organizations. The transactions that are observed in equilibrium will involve some combination of direct exchange between consumers and intermediated exchange through firms.

The discussion proposes a general theory of the firm based on a separation criterion. A transaction institution is a firm when its objectives can be separated from the consumption objectives of its owners. The separation perspective provides a bright line that can be used to distinguish firms from other economic institutions such as clubs and cooperatives. The separation theory of the firm provides insights into corporate law that complement the contractual perspective. The separation theory of the firm places emphasis on the benefits of delegation to management. The separation theory suggests that an excessive focus on contractual rules for managers as agents may reduce the benefits from the corporate form of organization. The separation theory of the firm highlights transaction benefits from general rules of corporate governance and the critical importance of property rights.