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THE MARGINALIST REVOLUTION IN CORPORATE FINANCE: 1880-1965

Herbert Hovenkamp*

Introduction

During the late nineteenth and early twentieth centuries fundamental changes in economic thought revolutionized the theory of corporate finance, leading to changes in its legal regulation. The changes were massive, and this branch of financial analysis and law became virtually unrecognizable to those who had practiced it earlier. In brief, the theory of corporate finance went through the same marginalist revolution that divides classical political economy from neoclassical economics.

The waning days of classical corporate finance were represented in the work of the Progressive "Muckrakers," who wrote detailed exposures of financial scandals that occurred during the Gilded Age,¹ calling attention to what they saw as an indefensible maldistribution of wealth and power in the United States.² The muckrakers' principal target was the large American business corporation, then of relatively recent vintage, as well as the men who controlled them, including John D. Rockefeller, Andrew Carnegie and railroad magnates Cornelius Vanderbilt and Jay Gould. For example, Charles Francis Adams wrote a series of articles in the *North American Review* exposing the great Erie Railroad stock scandal of the 1860's.³

*. Ben V. & Dorothy Willie Professor of Law, Univ. of Iowa. The dates given in the title are more-or-less arbitrary. At the beginning, the first major work of English neoclassical marginalism was Arthur Stanley Jevons, *The Theory of Political Economy* (1871). At the end, Eugene F. Fama's doctoral dissertation, often credited with assembling the data and proofs that created the modern efficient capital market hypothesis (ECMH), was published as Eugene F. Fama, *The Behavior of Stock-Market Prices*, 38 J.Bus. 34 (1965). See Herbert Hovenkamp, *Neoclassicism and the Separation of Ownership and Control*,

1. Roughly 1870-1900, and named after a book by Mark Twain about the financial excesses and inequalities of the period. Mark Twain and Charles Dudley Warner, *The Gilded Age: A Tale of Today* (1873).

2. See Walter M. Brasch, *Forerunners of Revolution: Muckrakers and the American Social Conscience* (1990); Arthur Ekirch, *The Decline of American Liberalism* 58-63 (1955); Louis Filler, *The Muckrakers: Crusaders for American Liberalism* (1968).

3. See Adams, *The Railroad System*, 104 N.Am.Rev. 476 (1867); Adams, *Legislative Control over Railway Charters*, 1 Am.L.Rev. 451 (1867); Adams, *The Erie Railroad Row*, 3 Am.L.Rev. 41 (1868); Adams, *Railroad Inflation*, 108

Three decades later Ida Tarbell's *History of Standard Oil* excoriated the financial dealings of John D. Rockefeller and his corporation.⁴

The story of the Erie Railroad became a model application of classical corporate finance theory used to expose a great scandal. Here a giant corporation robbed both stock purchasers and creditors by committing financial fraud through the issuance of "watered" stock.

Classical corporate finance theory rested on a model of absolute unity of the corporation and its shareholders. Shareholders were regarded as in control and were directly liable for shortcomings, although they could be duped by management. Within this classical conception of corporate finance a corporation was valued by the amount of capital that the proprietors, or founding shareholders, paid in when a corporation was formed or when additional shares were issued. Stock was said to be "watered" when its stated value exceeded the amount of capital that had actually been paid in to the corporation. For example, at the time a corporation formed its shareholders might issue 10,000 shares of stock at a stated par value of \$10 per share. Disclosure of these numbers to future investors, whether creditors or subsequent share purchasers, operated as a guarantee that 10 multiplied by 10,000, or \$100,000, had been paid in to the capital of the corporation. This amount was presumed to be the corporation's value. Further, it assured creditors that there was a fund that they could turn to in the event of a default. If the product of the number of shares and the stated par value exceeded the amount of capital actually paid in then the stock was said to be "watered" by the amount of the excess. Under classical finance theory, when stock was watered both minority or subsequently purchasing shareholders as well as creditors could be duped into thinking that a corporation was much more valuable than it really was.

William W. Cook, author of the most prominent corporate law treatise of the late nineteenth century, defended this traditional conception of par value and explained the problem of "watered" stock this way:

A share of stock is supposed, in theory, to represent its par value in

N.Am.Rev. 130 (1869); Adams, *A Chapter of Erie*, 109 N.Am.Rev 30-106 (1870); Adams, *Railway Problems in 1869*, 110 N.Am.Rev 116 (1870); Adams, *Railway Commissions*, 2 J.Soc.Sci 233-236 (1870); Adams, *The Government and the Railroad Corporations*, 112 N. Am.Rev 31 (1871). On Adams' career in railroad regulation, see Thomas K. McCraw, *Prophets of Regulation*, ch. 1 (1984).

4. Ida M. Tarbell, *History of the Standard Oil Company* (1904).

money or money's worth, paid in or to be paid in to the corporation.

...

All stock which has been issued as paid-up stock, but whose full par value has not been paid in to the corporation in money or money's worth, is watered to the extent that the par value exceeds the value actually paid in.⁵

Cook, whose views represented the ideology of the New York corporate bar during its late nineteenth century ascendancy,⁶ largely reconstituted the publicly traded business corporation as a routine investment device for shareholders, rather than as a special prerogative of the state as earlier corporate law writing had tended to do. As such Cook's treatise was strongly focused on the rights of stockholders and their potential abuse at the hands of unscrupulous managers, whose interests he tended to see as inconsistent with those of the corporation.⁷ It was

5. William W. Cook, *A Treatise on Stock and Stockholders and General Corporation Law* §21 at 28-29 (2d ed. 1889).

On Cook, Alfred F. Conard, *Cook and the Corporate Shareholder: A Belated Review of William W. Cook's Publications on Corporations*, 93 Mich.L.Rev. 1724 (1995). On Cook's life see the University of Michigan Law School's website, <http://www.law.umich.edu/library/cook/Pages/default.aspx>. Cook's gift of his entire fortune to that law school enabled the University of Michigan to build its law school Quadrangle.

6. See Robert Gordon, *Legal Thought and legal Practice in the Age of American Enterprise, 1870-1920*, in *Professions and Professional Ideologies in America, 1730-1940* (Gerald L. Geison, ed. 1983); Morton J. Horwitz, *The Transformation of American Law, 1870-1960: the Crisis of Legal Orthodoxy* (1992); William Wiecek, *The Lost World of Classical Legal Thought: Law and Ideology in America, 1886-1937* (1998).

7. See Conard, note ___ at 1726-1727. Writing during a period of widespread stock scandal, Cook said:

Corporations, with their vast capital stock, their great income, their rapidly changing personal property, and their large purchases and sales, have proved to be a temptation which corporate officers are too often unable to withstand. These companies have been found to be efficient instruments of fraud, speculation, plunder, and illegal gain. In these latter days the robbery and spoliation of corporations and stockholders by the corporate directors and managers have been systematized into well-known methods of proceeding, and the carrying out of such plans has become a profession and an accomplishment. The skill, audacity, experience, and talent of the highest order of administrative ability have reduced to a certainty the methods of diverting profits,

largely the eventual failure of Cook's ideal that led to the separation of ownership and corporate control that Berle and Means described in their New Deal book on the business corporation.⁸

As the Pennsylvania Supreme Court stated the classical view of corporate valuation in 1889, the "meaning of the word 'value,' and the basis on which the idea of value rests" is the representation made on the stock certificate of that which has been contributed. The stock certificate

stands in the hands of the subscriber for so much as, and no more than, the amount actually paid upon it.⁹

Classical corporate finance theory was designed to be applied under common law rules of contract and fraud. Computing corporate value under the theory was largely a matter of bookkeeping. As a result the rules were regarded as *self-executing*, in the sense that any reasonable manager could comply with them and challenges could be made when appropriate in a common law court. If the paid-in capital had taken the form of cash one could easily determine whether the stated par value of outstanding shares was supported by cash that had actually been paid in. Difficulties in judgment could arise if the payments had been made in noncash property such as real estate or other productive assets or intellectual property rights, for there could be questions about overvaluation. However, the common law of fraud was well designed to deal with such deceptions.¹⁰ The courts tended to give the incorporators

capital, and even the existence of the corporation itself, to the enrichment of the corporate managers and their co-conspirators. Corporations become insolvent and stockholders lose their investments, while individuals become millionaires. Illegitimate gains are secured and enormous fortunes are amassed by the few at the expense of the defrauded, but generally helpless, stockholders.

William W. Cook, *A Treatise on Stock and Stockholders and General Corporation Law* 667 (2d ed. 1889).

8. Adolf A. Berle and Gardiner C. Means, *The Modern Corporation and Private Property* 159 (1932).

9. *Appeal of Lehigh Ave. Rwy. Co.*, 18 A. 498, 499, 129 Pa. 405 (1889).

10. *Gillett v Chicago Title & Trust Co.*, 230 Ill 373, 82 N.E. 891, 904-05 (1907) (rights to an unwritten play and several unpatented inventions deemed valueless by court, so that stock received for these intangibles "remained wholly unpaid"); *Garden City Sand Co. v. Crematory Co.*, 205 Ill. 42, 68 N.E. 724 (1903) ("nearly

the benefit of the doubt if the evaluation had been made in good faith, even though subsequently proven wrong. As the Supreme Court observed in an 1886 decision:

If it were proved that actual fraud was committed in the payment of the stock, and that the complainant had given credit to the company from a belief that its stock was fully paid, there would undoubtedly be substantial ground for the relief asked. But where the charter authorizes capital stock to be paid in property, and the shareholders honestly and in good faith put in property instead of money in payment of their subscriptions, third parties have no ground of complaint. The case is very different from that in which subscriptions to stock are payable in cash, and where only a part of the installments has been paid. In that case there is still a debt due to the corporation, which, if it become insolvent, may be sequestered in equity by the creditors, as a trust fund liable to the payment of their debts. But where full-paid stock is issued for property received, there must be actual fraud in the transaction to enable creditors of the corporation to call the stockholders to account. A gross and obvious overvaluation of property would be strong evidence of fraud.¹¹

This self-executing nature of classical corporate finance theory was essential if the financial relationships among a corporation's managers, shareholders and creditors were to be governed by common law rules in courts of general jurisdiction. In the nineteenth century states were generally loathe to create regulatory agencies. But during the Gilded Age business corporations grew very large in terms of revenue, number and nature of shareholders. Further, their financial dealings grew far more complex than anything known in the earlier part of the century, save for

worthless" patent valued at over \$50,000 established that stock was watered:

"Money or money's worth" means cash or its equivalent. If the directors saw fit to accept property in lieu of cash, they could only take it at its fair cash market value, if it was property which had an ascertainable market value. If it had no ascertainable market value, then the only price at which the directors could purchase it was such price as could be realized by selling it to others for cash.

11. See, e.g., *Coit v. North Carolina Gold Co.*, 119 U.S. 343, 344-345 (1886). See also *Boynton v. Hatch*, 2 Sickels 224, 47 N. Y. 225 (N.Y. 1872) (creditor entitled to prove that incorporators grossly overstated value of paid in property); *Carr v. Le Fevre*, 27 Pa. 413 (1856) (contribution of coal mining property at its appraised value was proper so long as no reason existed for thinking that the appraisal had been fraudulently conducted or obtained).

some railroad corporations.

The number of watered stock scandals increased dramatically during the early twentieth century, culminating in a major wave during the period 1917-1920, and another one just at the onset of the Great Depression. In the meanwhile, nearly every state responded with regulatory legislation. Between 1911 and 1931, 47 out of 48 states passed "blue sky" statutes, of which more will be said later.¹² Given that general business incorporation statutes had been around for well over half a century by this time, the sudden passage of these laws in a brief period seems perplexing. The statutes generally required registration of securities and sales personnel, the provision of detailed financial information to prospective purchasers, as well as a state official's prior approval of new stock offerings.¹³

One explanation of the sudden growth of blue sky laws during this period is that they were special interest legislation intended to protect mainly small banks who were losing investments in the form of savings deposits to securities, and thus losing profits to underwriters. The banks themselves were regulated by state law limiting their own business severely, and the blue sky laws were intended to make the securities less attractive.¹⁴ Others have argued that the statutes were nothing more than long overdue reforms.¹⁵ Or, relatedly, they may have been a response to

12. See discussion *infra*, text at notes __; and see Paul G. Mahoney, the Origins of the Blue-Sky Laws: A Test of Competing Hypotheses, 46 J.L.Econ. 229 (2003); Jonathan R. Macey & Geoffrey P. Miller, Origin of the Blue Sky Laws, 70 Tex. L. Rev. 347 (1991); and see Louis Loss & Edward M. Cowett, Blue Sky Laws (1958).

13. See Mahoney, *id.* at 230-232 (detailing several provisions and providing a table organized by adoption date and provisions).

14. See Jonathan R. Macey & Geoffrey P. Miller, Origin of the Blue Sky Laws, 70 Tex. L. Rev. 347, 365 (1991). Cf. Mahoney, note __, which sees a much more complex set of causes, mainly political, in which the relative power of small bank lobbying seemed to affect the type of statute that was passed but numerous other factors were important as well.

See also George Benston, The Value of the SEC's Accounting Disclosure Requirements, 44 Acct. Rev. 515 (1969) (arguing that the regulation was inefficient because the cost of disclosure requirements exceed their value); George J. Benston, Corporate Financial Disclosure in the UK and the USA (1976) (similar).

15. Joel Seligman, The Historical Need for a Mandatory Corporate Disclosure System, 9 J.Corp.L. 1 (1983). See also Joel Seligman, The Transformation of Wall

the recent rise of the modern national securities markets, which required investor confidence,¹⁶ but also entailed that shareholders were even less involved in corporate affairs than they had been before, and thus needed some more protection from the state.¹⁷

I believe that the "watered" stock scandals of the late nineteenth and early twentieth century and the subsequent calls for increased regulation were a natural result of a different way of thinking about the financing and value of the business corporation. The source of this revision was the marginalist, or neoclassical, revolution in economic thought. The classical theory had seen corporate finance as a backward looking, relatively self-executing inquiry based on the classical theory of value. By contrast, neoclassical value theory was forward looking and as a result a much more realistic way of assessing a corporation's value; but it also required more prediction and interpretation, and thus was subject to more abuse. That possibility led the states first and later the federal government to respond with regulatory legislation.

While marginalism effected a sweeping change in regulatory attitudes toward the corporation, the changes in the basic theory of corporate behavior, and thus of finance, were at least as striking. The marginalist revolution turned the corporation into a rational actor intent on maximizing value. Within this model the idiosyncratic preferences of not only shareholders but also of creditors and even managers became largely irrelevant. Or to say it differently, the neoclassical concept of the corporation did not merely separate ownership from control; it separated corporate decision making from *all* human preference whatsoever, unless

Street: A History of the Securities and Exchange Commission and Modern Corporate Finance 19, 20, 38 (1982).

16. Thomas R. Navin and Marian V. Sears, *The Rise of a Market for Industrial Securities, 1887-1902*, 29 *Bus.His.Rev.* 105 (1955). See also Naomi R. Lamoreaux and Jean-Laurent Rosenthal, "Corporate Governance and the Plight of Minority Shareholders in the United States before the Great Depression 125, in *Corruption and Reform: Lessons from America's Economic History* (Edward L. Glaeser and Claudia Goldin, eds. Chicago: Univ. of Chicago Press, 2006).

17. See John Coffee, *The Rise of Dispersed Ownership: the Roles of Law and State in the Separation of Ownership and Control*, 111 *Yale L.J.* 1 (2001); Mark J. Roe, *Political Preconditions to Separating Ownership from Corporate Control*, 53 *Stan.L.Rev.* 539, 585-587 (2000); William G. Roy, *Socializing Capital: the Rise of the Large Industrial Corporation in America* 16-18 (1997); Alfred D. Chandler, *Scale and Scope: the Dynamics of Industrial Capitalism* 144-145 (1990). See also Mark J. Roe, *Strong Managers, Weak Owners: the Political Roots of American Corporate Finance* (1994).

those preferences were simply asserted to be maximization of value. Within the neoclassical model the separate human identities of shareholders or even managers came to matter only under the rubric of "agency costs," which were regarded as nothing more than an imperfection in the neoclassical corporate ideal.

The Classical Theory of Corporate Finance

Before the twentieth century corporate finance was regulated mainly by the common law of contract and fraud. Further, the substantive rules of finance were distinctly "classical," in the sense that they borrowed their ideas from the classical political economists -- mainly Adam Smith, David Ricardo, and John Stuart Mill. The principal difference between the classicists and the neoclassicists that followed them is that for the former value was measured objectively based on historical averages, while for neoclassicists it was subjective and based on future expectations.

The classicists believed that value was not a function of human desire, but rather of cost, which consisted mainly of the labor that went into something. The defining characteristic of this theory of value is that it was backward looking in time. One measured value by asking what had been contributed. Any time one tried to take more out than the historical contribution, the effect was to weaken the firm and perhaps eventually send it to ruin. As Adam Smith once stated, "The real price of everything, what everything really costs to the man who wants to acquire it, is the toil and trouble of acquiring it...."¹⁸ That is, one started with raw materials and any additional value added was the cost of the labor that went into it. For the business firm value then consisted of the firm's capital plus the added value provided by labor.¹⁹

The paradigm example of classical value theory applied to policy

18. Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations* 13 ([1776] reprint edition: Chicago, Encyclopedia Britannica, Inc., 1952).

19. See also *id.* at 563:

[T]he value of [gold and silver] has, in all ages and nations, arisen chiefly from their scarcity, and that their scarcity has arisen from the very small quantities of them which nature has any where deposited in one place, from the hard and intractable substance with which she has almost every where surrounded those small quantities, and consequently from the labour and expence which are every where necessary in order to penetrate and get at them.

was the wage-fund doctrine. David Ricardo, who wrote mainly in the early nineteenth century, argued that "The value of a commodity, or the quantity of any other commodity for which it will exchange, depends on the relative quantity of labour which is necessary for its production...."²⁰ As a result,

If the corn is to be divided between the farmer and the labourer, the larger the proportion that is given to the latter, the less will remain for the former. So if cloth or cotton goods be divided between the workman and his employer, the larger the proportion given to the former, the less remains for the latter.²¹

Under the wage-fund doctrine the amount of wages that could be paid in the current period was always a function of the amount of "surplus" that remained from the previous period. The classical idea of a wages fund was highly intuitive. For example, the farmer working his field this year necessarily had to live off that which he had produced during the prior year. If nothing was left over he would starve before he brought the current crops to harvest.²² The moral that the classicists drew is that the rate of wages to be paid in the current period could not exceed the amount in a "fund" that represented the accumulated surplus capital of the previous years. This fund then had to be divided among workers.²³ Any attempt to pay more would deplete the fund and impair the firm's capital.

Today we are inclined to see the wage-fund doctrine as silly and myopically backward looking, but that is only because we are conditioned by a lifetime of looking at the economic world through a forward looking neoclassical lens. Clearly, the value of wages does not depend on the size of a historical fund but rather on the employer's prediction of how much value an additional worker will add to her profits. If the incremental contribution of a laborer is \$10 per hour, then any wage up to \$10 an hour will be profitable for the employer.

20. David Ricardo, *Principles of Political Economy and Taxation* 11 [3d ed. 1821] (reprinted as vol. 1 of Piero Sraffa ed., *The Works and Correspondence of David Ricardo* (Cambridge University Press, 1951).

21. *Id.* at 35.

22. See Herbert Hovenkamp, *Enterprise and American Law, 1780-1860*, at ch. 16 (1991).

23. See, e.g., William G. Sumner, "Protective Taxes and Wages," 136 *N. Am. Rev.* 270, 271 (1883) "[c]hanges in rates of wages can only be produced by changes in the amount of capital distributable as wages, or by changes in the number of persons competing for wages."

But that distinctly "marginalist" way of assessing value was unknown to the classicists. Yale political economist William Graham Sumner, one of the staunchest defenders of the wage-fund doctrine, berated the emerging marginal theory of wages for suggesting "that a man who was tilling the ground in June could eat the crop he expected to have in September, or that a tailor could be wearing the coat which he was making."²⁴ Within twenty years of Sumner's comment, however, the wage-fund doctrine was widely regarded as completely exploded, replaced with the idea that the marginal rate of wages is driven mainly by the anticipated marginal rate of contribution that an employee makes to his employer. In Britain, John Stuart Mill repudiated the doctrine in 1869 and all of the British marginalists rejected it.²⁵ In the United States MIT economist Francis Walker also repudiated the doctrine in the 1870s.²⁶ Most other United States economists fell in line behind him before the end of the century.²⁷

The classical theory of corporate finance was based on analogous principles. The rise of the modern American business corporation began during the Jackson era with the development of the first general business incorporation statutes. The thrust of these statutes was to change the status of the business corporation from a special prerogative or franchise of the sovereign, such as a public utility or transportation service, to an ordinary and typical method of doing business.²⁸

24. William G. Sumner, "Wages," in *Collected Essays in Political and Social Science* 36, 50 (1885).

25. John Stuart Mill, "Book Review," in 5 *Collected Works* 680 (J. Robson ed. 1967) see Robert B. Ekelund, "A Short-Run Classical Model of Capital and Wages: Mill's Recantation of the Wages Fund," 28 *Oxford Econ. Papers* 66 (1976). See also Walter Stanley Jevons, *The Theory of Political Economy* 257-258 (1871); Alfred Marshall, "The Theory of Business Profits," 1 *Q. J. Econ.* 477 (1887); Marshall, "Wages and Profits," 2 *Q. J. Econ.* 218 (1888); Marshall, *Principles of Economics* 567 (1890).

26. Francis Walker, "The Wage-Fund Theory," 120 *N. Am. Rev.* 84, 102 (1875); see also Walker, *The Wages Question* 142-144, 405-406 (1876).

27. See Herbert Hovenkamp, *The Political Economy of Substantive Due Process*, 40 *Stan. L. Rev.* 379, 435 (1988). This included John Bates Clark, perhaps the leading technical economist in the United States at this time. See John Bates Clark, "The Possibility of a Scientific Law of Wages," 4 *Publications Am. Econ. Assn.* 39, 49 (1889).

28. See Hovenkamp, *Enterprise*, note ___ at Chs. 1-6.

The corporation was a "person" in the eyes of the law, and eventually even under the United States Constitution.²⁹ This meant that it owned its own assets and carried its own liability, posted its earnings and disbursements to its own account, made decisions in its own name about the extent to which surplus would be paid out as dividends to shareholders or invested for future production, borrowed money for future development in its own name, and appeared in court in its own name as both plaintiff and defendant. Shareholders were owners who could come and go, but the corporation as an economic entity was intended to be stable.

The classical theory of corporate finance was beguilingly simple and began with the premise that the corporation was a "person" whose financial resources and obligations should be treated no differently than the ledger or bank account of a biological person. Consistent with the classical theory, the value of a corporation was thought to be the amount that had been paid in in the past, much like a person's worth is a function of historically obtained assets. Thus the general incorporation statutes typically specified that a business firm could incorporate only upon payment into the corporation of a specified amount of capital.³⁰ If the declared par value of all the issued shares was significantly greater than the paid in capital the stock was said to be "watered," a term that derived from ranchers' practice of salting and overwatering cattle in order to increase their weight prior to sale.³¹ Watering of stock most typically occurred when the incorporators exaggerated the value of property that was contributed to the corporation at the time of its formation.

Both the common law and the early general incorporation acts approached the problem of watered stock by removing limited shareholder liability to one degree or another.³² Most famously, in 1824 Justice Story riding circuit developed the "trust fund" doctrine, which was adopted by the

29. *Santa Clara Co. v. Southern Pacific Railroad*, 118 U.S. 394, 396 (1886) (corporation a "person" for purposes of Fourteenth Amendment). See also Hovenkamp, *Enterprise*, note __, Ch. 4; Morton J. Horwitz, "Santa Clara Revisited: the Development of Corporate Theory," 88 *W. Va. L. Rev.* 173, 174 (1985).

30. See, e.g., Oscar Handlin & Mary Handlin, *Commonwealth: A Study of the Role of Government in the American Economy: Massachusetts, 1774-1861* at 144-150 (1941; rev. ed. 1969) (focusing on Massachusetts).

31. See Frederick Tung, *Before Competition: Origins of the Internal Affairs Doctrine*, 32 *J.Corp.L.* 33, 91 n. 293 (2006)

32. On the progression of legal doctrine, see Hovenkamp, *Enterprise*, note __ at 49-64.

Supreme Court a half century later.³³ The doctrine provided that a fictional trust existed against the assets of shareholders who paid less into the corporation than the declared value indicated. In short, stockholders could face personal liability to the extent of any shortfall between stated and actual paid-in value. Several states provided for some variation of the same thing by statute.³⁴ For example, the highly influential New York General Incorporation Act of 1848 assessed double liability against shareholders when actual paid in capital was less than the stated value.³⁵

The economic basis of the watered stock doctrine was the same as that of the Wage fund theory previously described: value must be measured by that which has been previously invested. As Charles Francis Adams noted in one of his many rhetorical exposes of the railroad watered stock scandals of the 1860's:

It is an elementary principle of political economy, that all wealth comes from the soil; neither human industry nor human ingenuity can produce any addition to the material possessions of mankind except from the earth.

As a result, "The sum total . . . of the wealth of any community and of the whole world consists of all that which it has extracted from the earth enriched by any value that may have been added to it."³⁶

Beginning with this classical and backward-looking premise about the nature of value, Adams attacked the increasingly popular railroad practice of paying stock dividends, which increased the stated par value of total outstanding shares without actually increasing the amount of capital that had been invested in the company.³⁷ Through the stock dividend, the

33. *Wood v. Dummer*, 3 Mason 308, 30 Fed. Cas. 435 (1824). See also *Sawyer v. Hoag*, 84 U.S. (17 Wall.) 610 (1873) (adopting trust fund doctrine).

34. These included New York, Pennsylvania, Indiana, Michigan, as well as others. See Herbert Hovenkamp, "The Classical Corporation in American Legal Thought," 76 *Geo. L. J.* 1593, 1655 (1988).

35. 1848 N.Y. Laws, ch. 40. See Hovenkamp, *Enterprise*, note ___, Ch. 5. See also Ronald E. Seavoy, *The Origins of the American Business Corporation, 1784-1855* at 192 (1982); Morton J. Horwitz, "Santa Clara Revisited: the Development of Corporate Theory," 88 *W. Va. L. Rev.* 173, 208 (1985).

36. Adams, *Railroad Inflation*, *supra* note ___ at 130-131.

37. *Id.* at 138-139. Actually, even under classical theory stock dividends watered the stock only if they were in excess of additional capital that the

stated capital of the company increased by the par value of the additional shares. Adams then praised the recently enacted Illinois Constitution for writing a special provision prohibiting railroads from issuing stock except for "money, labor or property actually received."³⁸

At the turn of the century most states had either statutes or constitutional provisions prohibiting shares from being distributed to shareholders unless the full stated par value of each share had been paid into the corporation.³⁹ As William Cook noted, the problem of stock watering was made acute by the law of corporate limited liability, which he staunchly defended.⁴⁰ Limited liability generally entailed that creditors could not look to the personal assets of shareholders in the event that corporate debtors defaulted and had insufficient resources to pay their debts. Cook noted that modern limited liability had permitted the modern securities market to come into existence. Without it, "the public would not dare to buy stocks, because they would be liable for corporate debts." As a result of limited liability "we find in some American corporations over 100,000 stockholders -- total strangers to each other, and scattered all over the world." Indeed, as Cook acknowledged, this very fact had permitted the "vast aggregations of capital which have revolutionized modern industry."⁴¹

One result of limited liability, however, was that creditors could turn only to the corporation in the event of default. They had to rely on the value of the corporation itself, rather than its human shareholders, in determining creditworthiness. Further, the value of the corporation was seen as nothing other than "the money actually paid for the stock."⁴² Cook strongly supported the state blue sky laws, which prevented corporate promoters from selling stock that represented no value except the blue sky. The statutes required a state agency to approve stock issues before they

corporation accumulated and designated for that purpose.

38. Ill. Const., Art. XI, §13 (1869). See Adams, *The Government and the Railroad Corporations*, 112 N.Am.Rev. 31, 52 (1871).

39. See Seymour D. Thompson, *Commentaries on the Law of Corporations* §3903 (1895) [3d ed. §3918, 1927).

40. On the development of limited liability in American corporate law, see H. Hovenkamp, *Enterprise*, note ___ at ch. 5.

41. Cook, "Watered Stock" -- Commissions -- "Blue Sky Laws" -- Stock Without Par Value, 19 Mich. L. Rev. 583, 584 (1921).

42. Id.

could be marketed.⁴³

No state corporation law found stock to be watered merely because the capital originally paid in had subsequently become worthless.⁴⁴ The decisive number was the value of the property at the time it had been paid in. Under the "trust fund" approach to limited shareholder liability,⁴⁵ the stated amount of capital was a fund upon which creditors were entitled to rely. If the fund as originally paid in was smaller than stated, creditors could rely on the personal assets of shareholders to make up the difference.⁴⁶ However, the doctrine was subject to one important exception, which suggested an understanding that value and paid in capital

43. *Id.* at 591.

44. E.g., *Coit v. North Carolina Gold Co.*, 119 U.S. 343, 346-347 (1886). See also 2 John C. Bonbright, *The Valuation of Property* 799 (1937).

45. See discussion *supra*, text at notes ____.

46. See, e.g., *Camden v. Stuart*, 144 U.S. 104, 114 (1892) (settlement of claims as between corporation and its shareholders did not preclude creditors from seeking to attach the shareholders' assets); *Handley v. Stutz*, 139 U.S. 417 (1891) (construing Kentucky provision that made incorporating stockholders personally liable for the value of unpaid installments:

The stock of a corporation is supposed to stand in the place of actual property of substantial value, and as being a convenient method of representing the interest of each stockholder in such property, and to the extent to which it fails to represent such value it is either a deception and fraud upon the public, or an evidence that the original value of the corporate property has become depreciated. The market value of such shares rises with an increase in the value of the corporate assets, and falls in case of loss or misfortune, whereby the value of such assets is impaired; and the increase of value of such stock is taken to represent either an appreciation in value of the company's property beyond the par value of the original shares, or so much money paid to the corporation as is represented by such shares. If it be once admitted that a corporation may issue stock without receiving a consideration therefor, and where it does not represent actual or substituted value in corporate assets, there is apparently no limit to the extent to which the original stock may be 'watered,' except the caprice of the stockholders. While an agreement that the subscribers or holders of stock shall never be called upon to pay for the same may be good as against the corporation itself, it has been uniformly held by this court not to be binding upon its creditors.

See H. Hovenkamp, *Enterprise*, note ____ at 49-55.

were not precisely the same: creditors were entitled to make independent judgments of corporate value and would be held to the consequences. Thus, for example, if a creditor knew that the capital had not been fully paid in but loaned money anyway, he implicitly had valued the corporation by some other means than its actual paid in capital. He could not then go after the personal assets of shareholders in the event of the corporation's insolvency.⁴⁷

The Marginalist Revolution

The term "watered" stock is quaint and largely obsolete today. Most shares are issued with no stated par value, or perhaps a very small nominal par value such as \$1 per share. While exaggerated valuations are still a problem, they are rarely tied to the value of what was paid in when a corporation was first formed, except in the case of very young corporations or those that have not yet started doing business. Rather, the exaggerations come from material misstatements about the firm's *prospects*, including assets, liabilities, as well as changes in markets that could materially affect a firm's future earnings.

As a matter of actual incentives, prospective shareholders have undoubtedly always made investment decisions based on their expectations about future earnings, and prospective creditors have certainly made similar calculations with respect to loans, particularly if they are unsecured. The problem was that classical political economy and classical finance theory did not account for these forward looking elements of human behavior. Indeed, the classical theory of value lacked any significant behavioral element whatsoever. For example, one also supposes that an employer in the early nineteenth century who knew nothing of theoretical economics made the decision to hire an additional worker in just the way that employers do today; namely, by considering how much added value the employer could be expected to produce in relation to costs. But the wage-fund doctrine⁴⁸ entirely ignored such subjective, forward looking elements of valuation.

Marginalism actually entered Anglo-American thought as a philosophical theory. The first marginalists were utilitarians concerned with the problem of how individuals and groups maximize their utility, or

47. *Coit v. North Carolina Gold Co.*, 119 U.S. 343, 347 (1886) ("The plaintiff had placed no reliance upon the supposed paid-up capital of the company on the increased shares, and therefore has no cause of complaint by reason of their subsequent recall.").

48. See discussion *supra*, text at notes ____.

happiness. John Stuart Mill, one of the first great English utilitarians and also a political economist, developed a purely hedonistic theory of human value in which pleasure and the absence of pain were the only measures of happiness, and Mill tied utilitarianism to purely individual preferences.⁴⁹ This association of "value" with "preference" was in fact a sharp break with the classical theory of value and signalled the beginning of the end for classical political economy. Nevertheless, Mill himself remained quite hostile toward marginalism in economic analysis.⁵⁰ Late in his life, however, when confronted with the glaring inconsistencies between the marginalism in his philosophical thought and his continued adherence to the wage-fund doctrine he completely repudiated the doctrine.⁵¹

Hints of marginalism in economic analysis stretch back to the beginning of the nineteenth century and even a little earlier.⁵² The one British writer whose work clearly presaged marginalist economics was Jeremy Bentham, whose work on utility theory included a concept of declining, or marginal utility, in the 1790s. The notions of declining marginal utility of income and the value of marginal deterrence in criminal

49. John Stuart Mill, *Utilitarianism* (1863); id., Ch. 2:

If I am asked, what I mean by difference of quality in pleasures, or what makes one pleasure more valuable than another, merely as a pleasure, except its being greater in amount, there is but one possible answer. Of two pleasures, if there be one to which all or almost all who have experience of both give a decided preference, irrespective of any feeling of moral obligation to prefer it, that is the more desirable pleasure. If one of the two is, by those who are competently acquainted with both, placed so far above the other that they prefer it, even though knowing it to be attended with a greater amount of discontent, and would not resign it for any quantity of the other pleasure which their nature is capable of, we are justified in ascribing to the preferred enjoyment a superiority in quality, so far outweighing quantity as to render it, in comparison, of small account.

50. See Jeff Lipkes, *Religion and the Reception of Marginalism in Britain*, 26 *Forum for Social Economics* 21 (2007); N.B. de Marchi, *Mill and Cairnes and the Emergence of Marginalism in England*, 4(2) *Hist.Pol.Econ.* 344 (1972).

51. See Mill, "Book Review," note ____; and Ekelund, note _____. Mill died four years later.

52. One prominent example on the Continent is Augustin Cournot, whose *Researches into the Mathematical Principles of the Theory of Wealth* was published in French in 1838 and contained well developed theories of marginal cost, marginal revenue and even monopoly profit maximization.

law were both developed in Bentham's *Principles* and his *Theory of Legislation*.⁵³ However, Bentham did not carry his observations over into formal economics and never developed theories of marginal cost or theories of economic value based on marginalism.

Marginalism emerged as a central tool of economic analysis in the early 1870's. Englishman William Stanley Jevons and Austrian Carl Menger, working separately, published books that sought to combine philosophical marginal utility theory with classical economics. Jevons' *Theory of Political Economy* (1871)⁵⁴ disputed the notion that was nearly sacred to the classicists that value depended on the amount of labor that had gone into something. Rather, "value depends entirely on utility," which was a purely subjective notion and could be totally unrelated to the amount of previous investment.⁵⁵ "[W]e have only to trace out carefully the natural laws of the variation of utility, as depending upon the quantities in our possession, in order to arrive at a satisfactory theory of exchange," Jevons concluded. His *Theory* developed the economic notion of diminishing marginal utility -- the more of something a person already has, the less she will be willing to pay for an additional unit. From this Jevons also developed the conception of equation of utilities -- that a person applying his money to numerous commodities will purchase an amount of each up to the point that he derives the same marginal utility from all.⁵⁶

Carl Menger's *Principles of Economics* (1871)⁵⁷ was less influential in the United States than Jevons' work, since Menger stood outside the British classical tradition. However, a large group of American graduate

53. J. Bentham, *An Introduction to the Principles of Morals and Legislation* [1789] (J.H. Burns & H.L.A. Hart eds 1970); Bentham, *The Theory of Legislation* [posthumous] (R. Hildreth transl. 1864).

54. A.S. Jevons, *The Theory of Political Economy* (1871; 3d ed. 1888). Alfred Marshall also deserves part of the credit. See 1 *The Early Economic writings of Alfred Marshall* 2 (J.K. Whitaker, ed. 1975). For a thoughtful perspective on the rise of marginalism, see D.E. Moggridge, *Maynard Keynes: An Economist's Biography* 84-86 (1992). John Bates Clark in the United States probably came to his marginalism independently. See J. Clark, *The Philosophy of Wealth*, chs. 4-5 (1886); J. Schumpeter, *History of Economic Analysis* 870 (1954).

55. Id. 3d ed. at 1.

56. "[W]hen the person remains satisfied with the distribution he has made, it follows that . . . an increment of commodity would yield exactly as much utility in one use as in another Id., 3d ed. at 59-60.

57. Carl Menger, *Principles of Economics* (1871).

students in political economy who went abroad for graduate study in the late nineteenth century ended up on the Continent, especially in Germany, and many of them studied Menger.⁵⁸

The two characteristics of marginalism that made it so different from the thought of the classicists were its subjective, behaviorist definition of value and its forward rather than backward looking perspective. The classicists had been convinced that value must be a function of scarcity and the amount of labor that went into something -- two things that could be measured objectively. But the neoclassicists realized that this could hardly be the whole story. As British neoclassicist Lionel Robbins pointed out, rotten eggs might be rare and cost just as much to produce as good eggs. But even one rotten egg might be more than anyone wants, and as a result they are not particularly valuable.⁵⁹ The essential ingredient missing from classical theory was subjective desire, whose intersection with scarcity created value. This led to Robbins' famous behaviorist definition of economics as "the science which studies *human behavior* as a relationship between ends and scarce means that have alternative uses."⁶⁰

This important behavioral aspect of economics so changed the focus of economics so as to make it a social science, rather than a natural science as the classicists typically thought of political economy. Under marginalism, the economic theory of value became entirely subjective, based on the individual utility function rather than on any criterion that could be determined from the desired good itself or the environment in which the choice was made. As a result, marginalism forced a shift in economics' methodology from the measure of *things* or the environment in which they were contained, to the measure of human choice and preference. To state it differently, economics' basis of measurement

58. On the influence of German historicism on Progressive Era economics, see Herbert Hovenkamp, *The First Great Law & Economics Movement*, 42 *Stan.L.Rev.* 993, 996-997 (1990). See also Dorothy Ross, *The Origins of American Social Science* 104-105 (1991); Mary Furner, *Advocacy and Objectivity: A Crisis in the Professionalization of American Social Science, 1865-1905* at 50-57 (1975).

59. Lionel C. Robbins, *An Essay on the Nature and Significance of Economic Science* 46 (1932).

60. Robbins, *Essay*, p. 16 (emphasis added). On the intellectual and technical history of Robbins' definition, see Roger Backhouse and Steven G. Medema, *Defining Economics: Robbins's Essay in Theory and Practice* (SSRN Working Paper Series, March 11, 2007), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=969994.

moved from an essentially natural science model to a model based on presumed rationality or observed individual behavior. One no longer measured value by looking at the amount of something that was available or the historical cost of producing it; rather one needed to measure individual willingness to pay.

The great Cambridge marginalist Alfred Marshall knew that the whole notion of subjective preference meant nothing at all unless it could be measured behaviorally. Thus one could meaningfully speak of consumer demand only "as represented by the schedule of the prices at which he is willing to buy different amounts of" something.⁶¹ In the highly influential eighth edition of his *Principles of Economics*, Marshall wrote:

If then we wish to compare . . . physical gratifications, we must do it not directly, but indirectly by the incentives which they afford to action. If the desire to secure either of two pleasures will induce people in similar circumstances each to do just an hour's extra work, or induce men in the same rank of life and with the same means each to pay a shilling for it; we then can say that those pleasures are equal for our purposes, because the desires for them are equally strong incentives to action for persons under similar conditions.⁶²

The other characteristic of marginalism that made it so important for business valuation was its forward rather than backward looking perspective. For the classicist valuation was all about averages, and averages were always historical. Thus the wage-fund doctrine as previously described determined the optimal rate of wages by considering the surplus left over from the previous production period.⁶³ By contrast, neoclassical theory asked "How much will one more laborer contribute to profitability," and concluded that any wage up to that amount would offer a positive contribution to the entrepreneur. In price theory, the classical conception of cost meant average cost, which looked at past expenditures divided by output. By contrast, "marginal" cost looked at the cost that a firm's managers anticipated that the firm would incur in the production of one additional unit. Further, marginal cost rather than average cost drives the decision about what price to charge or how much to produce. Indeed, perhaps the greatest single contribution of the marginalist model is that economic decision making occurs "at the margin" -- by comparing

61. A. Marshall, *Principles of Economics* 158 (1890).

62. Alfred Marshall, *Principles of Economics* 15-16 (8th ed 1920).

63. See discussion *supra*, text at notes ____.

anticipated gains against anticipated costs -- and in this calculation previous investment is formally irrelevant.⁶⁴

The principal problem faced by classical political economy had been to explain why people and firms produce and consume mixtures of goods, even though these goods appear to have widely different values. The classicists were also hard put to explain value itself. Why is air cheap, even though it is essential for survival? Why are diamonds expensive, even though they are luxuries? A more technical problem also faced by the classical political economists had been identifying what is a "cost," and determining what the relationship is between the cost of something and its value.

To illustrate some of the problems and the marginalist solution, consider the person whose favorite experience is eating peach ice cream. Why doesn't this person purchase and consume tons of peach ice cream and nothing else? After all, he prefers a dollar's worth of peach ice cream to a dollar's worth of any other product. Such questions so vexed the classical political economists that they generally resorted to elaborate theories of objective value, or "primary" goods; or to such metaphysical explanations as that people have a basic nature that requires them to consume a particular mixture of goods. But such explanation paradigms were totally unhelpful in explaining the manifold differences one could observe in the choices of different individuals. Classical political economy generally settled on a rather ambiguous notion that the "value" of anything is a function of its cost. But once again, that did not explain the fact that different people placed widely different values on one unit of a good, even though its cost was everywhere the same; further, pre-marginalist economics had only the poorest conception of what a "cost" really was, since all costs had to be stated as either totals or averages, and neither of these seemed to be determinative of profitability or rate of output.

In the case of the peach ice cream, the marginalist answer was so elegant and obvious that it appeared instantly to be the key to almost every question about individual and social value. Even the person who says his favorite experience is eating peach ice cream experiences declining marginal utility for it. The value of each further quart of peach ice cream declines as he has more. He will buy peach ice cream until the utility from the next unit to be purchased has fallen to a level equal to his marginal

64. As John Maynard Keynes noted already in his student notes of 1905, previously expended labor has no impact on value if value is a function of marginal desire, or willingness to pay. See Robert Skidelsky, *John Maynard Keynes: Hopes Betrayed, 1883-1920* at 165 (1983).

utility for some other good, such as broccoli. For example, suppose he obtains twenty utils⁶⁵ of utility from his first quart of peach ice cream. Saying that his favorite experience is eating peach ice cream is equivalent to saying that the value he places on this first unit of peach ice cream is greater than the value he places on the first unit of any other good. But this person will not likely value a second quart of peach ice cream by quite as much as the first, and almost certainly will not value the 100th quart by as much as the first. Suppose he obtains twenty utils from the first quart of peach ice cream, eighteen utils from the second, sixteen from the third, and so on in linear fashion. By contrast, he obtains five utils from his first pound of broccoli, four from the second, and so on.

The classicists, not having the concept of marginal utility, observed only that the subject preferred peach ice cream to broccoli and were hard pressed to explain why he purchased any broccoli at all. But on the above numbers the marginalist would draw remarkably precise conclusions. Assume that peach ice cream cost \$1.00 per quart, broccoli \$1.00 per pound, and the subject had ten dollars to spend. He would buy eight quarts of ice cream and two pounds of broccoli. Once he had seven quarts of ice cream the marginal utility for the next quart would be four utils. At that point an additional dollar spent on a pound of broccoli would give him five utils of utility while another quart of peach ice cream would produce only four. A utility maximizer would buy a pound of broccoli. Then, with two dollars left he would face three options. He could buy two additional quarts of ice cream which would produce four utils for the first and two utils for the second, or six. He could buy two additional pounds of broccoli, which would give four utils and three utils, or seven. Or he could buy one of each, which would produce four utils and four utils, or eight. He would buy one of each, giving him a total of eight quarts of peach ice cream and two pounds of broccoli.

Neoclassicism produced several important corollaries from the simple statement of marginalism described above. *First*, when people place value on goods that they are considering, only the marginal value, not the total value, is relevant. *Second*, people tend to equate utilities over their entire set of purchasing decisions. Presumptively, every person's stock of goods is such that her marginal values are all precisely identical. To the extent they are not, she corrects the situation the next time she purchases by buying whatever has the highest marginal value.

Third, business firms, whose goal is the maximization of profits, also equate marginal utilities, but these are measured as marginal expenditures and marginal revenues. For example, in deciding what inputs

65. A "util" is an imaginary unit of satisfaction.

to use in making a product, the firm maximizes its profits by using each input up to a point that its marginal cost is identical to the marginal cost of every other input. If labor and machinery are alternative inputs into a product and the current cost of labor is \$5 per unit of value produced while the current cost of machinery is \$4, the firm will invest in more machinery and less labor until the two are equalized. Likewise, in deciding what mixtures of products to produce, the firm produces each up to the point that the marginal profit from producing more is equalized. Suppose a firm makes widgets and gidgets. Additional gidgets can be sold at a profit of \$1.50 while additional widgets can be sold at a profit of \$1.00. The firm will make relatively more gidgets and relatively less widgets. It will continue making this adjustment until the marginal profitability is the same, or until the rate of widget production falls to zero, whichever comes first.

Thus marginalism provided economics with the basis for a general theory of consumer demand, a theory of value, a theory about production and consumption, and a theory of costs, all of which could be quantified with great apparent mathematical precision, although measurement problems remained difficult. Thanks to marginalism, neoclassical economics became more coherent and rigorous than classicism had ever hoped to be.

The Emergence of Neoclassical Price Theory

Neoclassical economics developed out of a marginal utility theory that based value on forward looking subjective preference rather than historical averages of objective investments. But in the 1920s a divergence occurred in neoclassical economics that controls its various subdisciplines to this day. Neoclassical price theory -- or the theory of how firms maximize profits -- very largely did away with the study of the *actual* preferences of the business firm and simply assumed that the business firm was organized in order to maximize profits. Even today, in neoclassical price theory and industrial organization (the study of firms and markets) the subjective intentions of a business firm rarely count for much except as a device for explaining otherwise ambiguous behavior.

For example, when an economist says that in a competitive market a firm prices at marginal cost, or that a monopolist equates marginal cost and marginal revenue, it is not because she has conducted a survey asking firms how they set prices or output. It is because making decisions in these ranges can be shown to maximize profits on the basis of strictly objective and formal criteria, such as the amount of market power that the firm has and the nature of market demand.

In contrast, *welfare* economics deals largely with the preferences of

biological individuals, who have much more complex motives than maximization of profits or wealth. In order to study consumer behavior, for example, one must to a considerable extent rely on revealed preference.⁶⁶ In sum, welfare economics rested on "behaviorist" concepts while the economic theory of the firm largely rested on an assumption of profit-maximization.

Because modern corporate finance is a mixture of economic theory and economic policy it has never insisted quite so stridently that firm behavior must be evaluated without regard to subjective intent. Further, a great deal of improper behavior by firms may also not be profit maximizing, in the sense that it maximizes the value of the firm as a whole. Rather, it may simply transfer wealth from shareholders or employees to managers, and often reduces corporate profits in the process. Nevertheless, the neoclassical *theory* of corporate finance very largely treats the modern corporation as a unitary profit-maximizing entity and assesses its behavior on that basis. Under the formal theory the separate identity of both shareholders and managers is irrelevant.

Marginalism and Corporate Value

In sharp contrast to classicism's focus on previously invested capital and stated par value, neoclassicists viewed the value of a corporation as its ability to earn profits in the future. This was in turn a function of the degree by which anticipated revenues would exceed anticipated costs.⁶⁷ Indeed, as many neoclassicists would point out, the amount of previous investment often had very little to do with value. Some corporations which had invested little but found just the right niche were worth many times more than paid in capital. Others, which had expended giant sums on research that had gone nowhere, might be worth only a tiny fraction. To be sure, the classicists had known these facts for almost a century, but had been unable to develop a theory of value that would account for them.

66. On this all important distinction between the concept of value in price theory as opposed to emergent welfare economics see University of Chicago economist Jacob Viner's harsh critique. Jacob Viner, *The Utility Concept in Value Theory and Its Critics. II. The Utility Concept in Welfare Economics*, 33 J. Pol. Econ. 638, 657 (1925), accusing welfare economists of importing the objective concepts of price theory into their analysis in order to avoid the harder job of empirical testing of actual human preferences. "[M]uch of what passes for utility theory is really objective price-theory presented in the purloined terminology of subjective analysis...." And see Herbert Hovenkamp, *The Limits of Preference-Based Legal Policy*, 89 Nw.U.L.Rev. 4, 81-82 (1994).

67. One of the better statements of this position among financial economists is William Lough, *Business Finance*, Ch. 8 (1917).

The marginalist revolution had several implications for corporate law. First, the entire concept of "par value," with par measured as a function of previous investment, was of little worth in measuring the value of a corporation. If the concept of "par value" was to prove useful at all, it must be based on the current value of the corporation's assets, with assets generally measured by their value to the corporation itself -- that is, their capacity to produce a profit, or their exchange value in a sale. So George Kennan argued in 1916 that it was perfectly legitimate for the Chicago and Alton Railroad to reorganize in 1899 and greatly increase its capitalization, even though no additional capital had been paid in to the corporation. The new value simply represented the railroad's increased prospects to earn a profit.⁶⁸ Opponents writing in the economics journals generally acknowledged that in theory anticipated ability to earn a profit was a superior measure of value than historically invested capital; they complained merely that while invested capital was easily measurable, determining ability to earn a profit was a purely speculative exercise.⁶⁹

In 1909 a group of corporate attorneys led by Francis Lynde Stetson convinced the New York Bar Association to back a proposal to amend the state's corporation law to permit shares to be issued "without the dollar mark" -- that is, without a stated par value.⁷⁰ In 1912 New York became the first state to pass a statute permitting corporations to issue shares having no-par, or merely nominal par, value. The statute required the company to state what its working capital was, but permitted the company to state the value of this capital in terms of current market value, which of course reflected the business prospects of the firm.⁷¹ During the 1910's most states passed similar statutes. By 1927 nearly forty states had amended their corporation statutes to permit no-par shares,⁷² and by 1947 every state except Nebraska and Kentucky had done so.⁷³ As the new

68. George Kennan, *The Chicago & Alton Case: A Misunderstood Transaction* 28-34 (1916).

69. James Bonbright, *No-Par Stock: its Economics and Legal Aspect*, 38 Q.J.Econ. 440 (1924); James Bonbright, *Earning Power as a Basis of Corporate Capitalization*, 35 Q.J.Econ. 482 (1921).

70. William Z. Ripley, *Main Street and Wall Street* 46 (1927).

71. Act of April 15, 1912, §§19-23 of the Stock Corporation Law. See also Parker, *Corporation Manual* §8 (1930).

72. See 5 Seymour Thompson, *supra* note ____ at §3627.

73. See Carlos L. Israels, *Problems of Par and No-Par Shares: A Reappraisal*,

statutes developed, they generally permitted the shareholders or directors to declare the capital of the corporation, making changes periodically.⁷⁴

The Twilight of Classical Valuation Theory

The most general and important implication of marginalism for legal thought was its destruction of the concept that law can be either "private" or self-executing. As originally conceived, deterrence based legal theories may have been based on some conception of the person of average sensibility, temperament, or carefulness. But the conception quickly gave way to the notion that the "average" person was nothing more than the state's reification of a standard that its decision makers wished to impose. Ultimately, the standard was normative and objective.

Just as important, neoclassicism's forward looking standards of value greatly contributed to the uncertainty and open-endedness of legal policy making. Contracts were no longer thought of as bargains made in the past, but as the creation of ongoing relationships in need of regulation. The transition to no-par corporate shares meant that corporate creditworthiness could no longer be viewed as the result of a precisely measurable transaction completed in the past.

Looking forward necessarily implied greater uncertainty than looking back, and uncertainty seemed to increase the opportunity for abuse and error. These two factors -- that standards were publicly rather than privately created, and that forward-looking policies needed to be managed in ways that backward ones did not -- account for the rise of the regulatory state during the New Deal.

Many Progressives viewed the rise of no-par stock with considerable suspicion, generally concluding that it represented nothing more than legislative capture by corporate entrepreneurs. Berle and Means objected that the rise of no-par shares created yet another opportunity for corporate managers and majority shareholders to abuse minority shareholders. The movement toward no-par shares gave directors the power to "dilute at will" the value of outstanding shares.⁷⁵ And they had

47 Col.L.Rev. 1279 (1947).

74. As Berle and Means noted in 1932, virtually all statutes by that time permitted the Board of Directors to declare the capital. Adolf A. Berle and Gardiner C. Means, *The Modern Corporation and Private Property* 159 (1932).

75. Berle and Means, *supra* note __ at 159. Berle had expressed similar opinions a few years earlier. See Adolf August berle, *Studies in the Law of Corporation Finance* 64 (1928) ("Probably the greatest single step in transferring control of property rights from stockholders to corporate managements was taken

a point. One problem with the marginalist mechanism of establishing value was that it was so imprecise and susceptible of manipulation.

Further, this separation of "value" from paid-in capital was just more evidence that the link between ownership and control of the corporation was all but gone. Berle and Means wrote:

What is a share of stock "worth." . . . Curious as it may seem, the fact appears to be that liquid property, at least under the corporate system, obtains a set of values in exchange, represented by market prices, which are not immediately dependent upon . . . the underlying values of the properties themselves. Two forms of property appear, one above the other, related but not the same. At the bottom is the physical property itself, still immobile. . . . Related to this is a set of tokens, passing from hand to hand. . . , which attain an actual value in exchange or market price only in part dependent upon the underlying property. Into it enter elements which are not normally admitted to be elements in the value of the latter. The tokens may, for instance, represent in their value an appraisal of the supposed ability of the particular management interposed between the properties and the owners.⁷⁶

Thus under no-par stock the value of a corporation -- previously accessible to anyone who knew stated par and the number of shares of each class outstanding -- became a mystery known only to the managers. Minority shareholders acted largely in ignorance. These observations tended to exacerbate the view held by many marginalist liberals, such as John Maynard Keynes, that the stock market had become little more than a "casino" in which equity traders gambled, paying prices that had little to do with a corporation's worth. Only after considerable marginalist theorizing did this view give way to the modern belief that capital markets are efficient and share prices generally reflect a company's intrinsic worth.⁷⁷

In any event, the need for complete, *ongoing* disclosure to prospective shareholders loomed much larger under the marginalist theory of value, since it looked to current capacity to earn a profit rather than historical investment. As late as the 1860's stock certificates had been looked at as almost a form of "currency," in which the par value stated on

when the institution of non-par-stock was adopted into American corporation law.").

76. *Id.* at 285-286.

77. See discussion *infra*, text at notes ____.

the certificate was presumptive evidence of the value of the corporation. Indeed, even in 1924, after no-par stock had become well established, Cornelius Wickersham complained that "gullible" purchasers continued to believe that the stated par value on a stock certificate somehow represented the value of the shares.⁷⁸ Rather, a certificate stating "that the holder is entitled to the share in the assets thereby represented (whatever those assets may be) is a more accurate statement of his rights as a stockholder of the corporation than one designating a par value."⁷⁹

Thus by the time of the Blue Sky laws and a little later the federal Securities Acts, the perceived problem was not exaggeration of paid in capital, but rather "balance sheet inflation." Section 11 of the federal statute created liability in the directors for knowingly making false statements concerning the value of virtually any element of corporate assets, and gave a lawsuit to anyone who purchased shares in reliance on such statements.⁸⁰

The great corporate scandals of the Gilded Age produced an anti-business corporation rhetoric that remains with us today. Certainly there is more than a kernel of truth in the corporate scandal stories, but much of the reality is that the Progressive Era muckraking reflected a theory of corporate finance that was in the process of collapsing as corporate finance theory and the legal system shifted toward a more neoclassical methodology of corporate valuation. Part of the story is also driven by the historical happenstance that the increase in corporate value during the late nineteenth century was unprecedented, making historical investment a particularly bad surrogate for corporate evaluation. Quite simply, corporate managers looking forward at earnings prospects might see a number many times larger than historical invested capital.⁸¹

Nevertheless, the resiliency of the classical theory of corporate valuation was very strong, and it lasted much longer than the wage fund

78. Cornelius Wickersham, *The Progress of the Law on No Par Value Stock*, 37 Harv. L.Rev. 464, 464 (1924). See also Cornelius W. Wickersham, *A Treatise on Stock Without Par Value of Ordinary Business Corporations* (1927).

79. *Ibid.*

80. See *In re Haddam Distillers Corp.*, 1 S.E.C. 37 (1934); *In re Thomas Bond, Inc.*, 5 S.E.C. 60 (1939).

81. On Corporate growth during the period see Sean Dennis Cashman, *America in the Gilded Age 1-40* (3d ed. 1993). See generally Alfred D. Chandler, *The Visible Hand: The Managerial Revolution in American Business* (1977) (rise of large vertically integrated corporation during this period).

doctrine.⁸² Even Progressive liberal economists who found the marginalist revolution quite useful in other area were skeptical about no-par stock. A good example is Progressive railroad economist William Z. Ripley of Harvard's economics department. Although Ripley was too much a marginalist to believe that "value" ought to be based on historically invested capital rather than anticipated profitability, he nonetheless believed that the no-par share statutes would prove to be the breeding ground of "fraud and deception."⁸³ This theme would be repeated among Progressives, whether marginalist or not: whatever one might think of the process of removing par value as a basis for corporate valuation, doing so entailed considerably more managerial speculation, making some form of regulation in order.

Nineteenth century courts rejected out of hand the marginalist argument that the true value of a corporation was its earnings potential. Under this rejected argument a stock should not be considered "watered" merely because the stated par value was less than the amount paid in. Rather, the relevant number should be the present value of future earnings. As the Supreme Court concluded in 1891, in determining whether sufficient capital had been paid in, it would not look at intangibles reflecting on the earning power of the corporation, for these were "too unsubstantial and shadowy" to provide an estimate of value. The Court conceded "that the goodwill of a business may be the subject of barter and sale as between the parties to it. . . ." But in cases involving corporate default and a creditor allegation of watered stock, they provided no basis for determining value.⁸⁴ A 1905 New Jersey court -- one of the courts that was most solicitous of corporate managers -- concluded that corporate promoters were not entitled to declare the value of paid in property by estimating future corporate profits. . . .⁸⁵ The court rejected the view that it was "competent and lawful to make up the valuation of the visible property to be purchased for stock issued, by adding . . . a sum of money ascertained by the capitalization of the annual profits expected to be realized from a favorable

82. See discussion *supra*, text at notes ____.

83. W. Ripley, *Main Street and Wall Street* 49 (1927).

84. *Camden v. Stuart*, 144 U.S. 104, 115 (1892).

85. See *v. Heppenheimer*, 69 N.J.Eq. 36, 61 A. 843 (1905) (rejecting evaluation that depended in part on anticipated suppression of the firm's competitors and anticipated price increase of the product from \$20 to \$28 per ton; court states that paid-in property used for evaluation must be something "visible and tangible." 69 N.J. Eq. at 53, 61 A. at 850.

marketing of the product."⁸⁶ Most nineteenth century courts enforced this rule simply by asking juries whether the money and property paid into the corporation had a value at the time it was paid in that equaled or exceeded the stated par value of the shares. This rule, generally known as the "true value" rule, ignored estimates of value made by the incorporators themselves, even if these had been made in good faith.⁸⁷ The "only question for the jury is, was the property worth the amount of the stock."⁸⁸

But even as these courts were stating the orthodox view, others were developing rationalizations that changed corporate valuation from a classical to a neoclassical exercise. Already in 1886 the Supreme Court had adopted a standard for the federal courts which deferred to the incorporators' good faith estimates of the value of their corporation.⁸⁹ If the estimate was made in good faith, then the corporation would not subsequently be found undercapitalized simply because the value of paid in property turned out to be inadequate to cover the corporation's debts. This good faith test became relevant when paid in capital included real or personal property instead of or in addition to cash. The inevitable consequence of the good faith rule was that the value of the capital "paid in" began to reflect estimates of anticipated profitability, for such estimates guided even "good faith" judgments about the value of non-cash property.

In approving of the no-par statutes, Victor Morawetz, one of the most distinguished corporation scholars in the United States, acknowledged that a business corporation must have a capital that cannot be impaired by the declaration of stock dividends. However, "it is not necessary that the amount of capital should be fixed by reference to the nominal or par amount of the shares issued by the corporation, and it is not necessary that the shares should purport to represent specified sums of money contributed to the capital."⁹⁰ Then Morawetz noted the emergent view that in most cases the amount of capital paid in bore little relationship to the value or creditworthiness of the corporation:⁹¹

86. *Id.* at 848.

87. See *Van Cleve v. Berkey*, 143 Mo. 109, 44 S.W. 743 (1898); and see *Clinton Mining & Mineral Co. v. Jamison*, 256 F. 577, 582 (3d Cir. 1919), which discussed the rule and ultimately rejected it.

88. *Clinton*, 256 F. at 579.

89. *Coit v. North Carolina Gold Co.*, 119 U.S. 343, 347 (1886).

90. Victor Morawetz, *Shares Without Nominal or Par Value*, 26 Harv.L.Rev. 729 (1913).

91. One exception was banks and similar corporations "whose business is to

In most cases, the capital, or a large part of the capital, or a corporation is invested permanently in fixed plant or machinery which cannot again be converted into cash, and whose value, in great measure depends upon the profitableness of the company's business."⁹²

A potential creditor or purchaser of shares was probably less interested in the amount of capital that had been paid into the business than in the business' potential to earn a profit. By the late 1910s a few courts began to hold that the proper measure of the value of property was the going concern value of the property to the corporation rather than its historical value.⁹³ As a consequence, the "trust fund" doctrine gradually disappeared.⁹⁴ James Bonbright, one of the 1930's best known scholars of corporate finance, concluded that the emerging definition of corporate value was far more realistic than the classical definition because, as far as creditors are concerned, the relevant values are "going concern" values. Normally, "the amount of `invested capital' in which he is supposedly interested is the amount of profit-making power which the assets may confer upon the company."⁹⁵

In his influential treatise on corporate finance, Arthur Stone Dewing distinguished between economic, accounting and legal conceptions of corporate capital. Importantly, both the legal conception and the accounting conception relied heavily on the stated values of amounts that had previously been paid in. By contrast, businessmen and investors were interested mainly in the economic meaning of capital, which had to do with productive value. A corporation might have a patent for which it paid little

deal in money, credits, and securities, and whose assets are kept in liquid form." Id. at 729.

92. Ibid.

93. For example, *Clinton Mining & Mineral Co. v. Jamison*, 256 F. 577, 582 (3d Cir. 1919), which permitted valuation to be based even on the probability that a mining corporation would discover additional ore not yet discovered on the date of the claim.

94. See 5 S & T. Thompson, *Commentaries on the Law of Corporations* §3425 at 260 (3d ed. 1927), who concluded that the trust fund doctrine was "not only monstrous but in practicable application would be ruinous to the business management of corporations."

95. 2 Bonbright, *supra* note ___ at 801.

or nothing, noted Dewing, but was nevertheless of great value.⁹⁶ Rather than looking at a corporation's creditworthiness, or "capital," as that which had been paid in, it should be viewed as representing "anything of concrete and specific value, material or intangible, which affords definite help in enabling the corporation to conduct its business at a profit."⁹⁷ Dewing went on to note that, although this conception of capital was the important one, it was easily subject to abuse because the corporation could more easily exaggerate its earnings potential than it could the cash value of specific cash or property that had been paid in in the past.

In defending the rise of no-par shares, Dewing noted simply that "the right to participate in earning is the fundamental characteristic of stock -- not its right to participate in the property. . . ." As a result, no-par shares were designed to "record the proportional rights of their holders in the earnings of the corporation and ignore the amount of the contribution on which their rights were based."⁹⁸

Under the classical theory, par value was "the actual and substantial stake contributed by the owners of the business, and on the strength of this stake they are justified in asking for and receiving credit."⁹⁹ But the problem with this theory was that paid in capital had absolutely nothing to do with the value or creditworthiness of the corporation as a going concern.

[A]s soon as the new corporation begins business operations, whatever correspondence between the value of its property and the nominal or money value of its capital stock that may have existed in the beginning, is lost immediately. Some of these operations result in a profit, in which case the corporate property is increased while the amount of outstanding capital stock remains the same; some operations result in a loss, and a discrepancy between the property and the par value of the capital stock arises in the opposite direction. The important thing to observe is that the equality between property and capital stock, however justified at the beginning, is upset by the very operations for which the corporation was organized."¹⁰⁰

96. 1 A.S. dewing, *The Financial Policy of Corporations* 55 (4th ed. 1941) (first edition, 1919).

97. *Id.* at 56.

98. *Id.* at 68.

99. Dewing, *supra* note ___ at 71.

100. *Id.* at 73-74.

Dewing was more sanguine than Progressive economists about the potential for abuse. In his view no-par shares would serve to *increase* the participation of investors in corporate affairs. Having removed previously invested capital as a basis for estimating value, the prospective shareholder or lender would be

forced to investigate the earnings of the corporation, present and past, the history of the corporation and its managers, its standing in the industry, and the value of its shares with reference to current and future interest rates, as they are affected by the rise and fall of industrial activity. These factors and others like them determine values, and anything that forces the investor to seek for them tends to conserve the social capital by encouraging greater intelligence and acumen among investors."¹⁰¹

How liability should be assessed when corporations with no-par stock were found to be undercapitalized was initially a difficult problem for the courts, and they faced the new method of valuation with considerable confusion. In *Norton v. Lamb* (1936) the Kansas Supreme Court simply held that subscribers who had not actually paid even the \$1 nominal par value stated on the share certificates could be held liable for that sum.¹⁰²

Other decisions served to realize the worst fears of the Progressive critics. Courts held that no-par shares effectively meant that creditors were without a remedy provided that the nominal par, if stated, had been paid and the corporation met any minimum capitalization requirement assessed by state law. For example, in *G. Loewus & Co. v. Highland Queen Packing Co.* (1939), the incorporators had transferred property worth \$1500 to the corporation but carried this on their books as capital worth \$6000. Under New Jersey law the requirements for issuance of no-par shares had been met and the statute held that such shares "shall be deemed fully paid and non-assessable, and the holder of such shares shall not be liable to the corporation or its creditors in respect thereof."¹⁰³ This denied the creditors any remedy. Likewise, the Sixth Circuit held that the regime created by no-

101. Dewing, *supra* note __ at 75. Compare R. H. Hollen & R.S. Tuthill, *Uses of Stock Having no Par Value*, 7 A.B.A.J. 579 (1921) (no par stock forces the investor to look at the corporation's current value before making an investment decision, rather than focusing on that which was historically paid in.).

102. *Norton v. Lamb*, 144 Kan. 665, 62 P.2d 1311 (1936).

103. N.J. Rev. Stat. §14:8-6 (1937).

par statutes was essentially "let the creditor beware. . . ." ¹⁰⁴

As Dodd and Baker had pointed out in their widely used casebook on corporate law, the issuance of no-par shares did not absolve the corporation of an obligation to state its value to potential creditors. Rather, it shifted the focus away from the historical value of capital at the time the shares had been issued to the current value that the corporation stated in its accounting books. Speaking of the problem of "watering" of no-par shares, they said:

Even where the transaction or acquisition is one of mere barter of no-par shares for property or services, a valuation of the latter is a practical necessity from the mere fact that corporations are expressly or impliedly required to keep books of account, and as yet there is no known way of keeping books in other than monetary terms. So if Blackacre is acquired through the issue of no-par shares, it is necessary to apply to Blackacre some figure in dollars at which to enter it on the books as a debit to an asset account. . .

¹⁰⁵

In 1947 Carlos Israels noted that a corporation could avoid all stock watering liability by simply stating its capital conservatively -- no greater than a price at which contributed property could readily be sold -- and then add any additional evaluation as paid in surplus. Such a company was not undercapitalized, and creditors could make anything they wished of the paid-in surplus figure. In all events, the *value* of the shares was driven not by the amount that had been paid in:

The investing public has been "educated" to the point where it is now quite willing to pay much more than par for a par value share, and where it is very little concerned with book value, or with the proportion of the price of no-par shares proposed to be credited to capital. Earnings or earnings possibilities appears to dominate investor thinking as to price. ¹⁰⁶

By 1940 economists were taking a much more explicitly marginalist look at the problem. For example, in the second edition of their book on public control of corporations, Charles Tappet and Shaw Livermore noted

104. *Johnson v. Louisville Trust*, 293 F. 857 (C.C.A.6th 1923).

105. E. Merrick Dodd & Ralph J. Baker, *Cases and Materials on Business Associations* 1004 (1940).

106. Israels, *supra* note __, 47 Col. L.Rev. at 1292-1293.

that the problem of watered stock had been attended by "much loose thinking and writing." First of all, true value was virtually impossible to determine, and there were several methods of going about it:

If physical appraisal by engineers is meant, then earning rates could be matched against a definite figure and a proper amount of securities obtained. But even slight acquaintance with the conditions of competitive industry teaches that there is no typical relationship between value of physical assets and earning power. It may be very different for a chewing gum concern and a steel plant.¹⁰⁷

Tippetts and Livermore identified stock as watered simply when its declared value "was larger than a reasonable capitalization rate applied to the earnings" would warrant.

The Neoclassical Corporation: From Institutionalism to the Efficient Market Hypothesis

Marginalism's Critics: Darwinism and Institutionalism

Marginalism was only one of the two great scientific revolutions of the Victorian Era. During this period American scientific and moral values were overrun at least as much by Darwinism, also of essentially British origin.¹⁰⁸ These two theories of human behavior were hardly consistent with each other. Nevertheless they worked together in an odd way to make behaviorism the key to understanding nearly everything important about the human condition.

American intellectual historians in the fifties and sixties wrote the history of the Gilded Age and Progressive Era as if it were entirely a story about the various intellectual offshoots of Darwinism.¹⁰⁹ Indeed, it is still

107. Charles S. Tippetts & Shaw Livermore, *Business Organizations and Public Control* 378 (2d ed. 1941).

108. Charles Darwin, *On the Origin of Species by means of natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859). On Darwin's influence on late Victorian American intellectuals see Louis Menand, *The Metaphysical Club: A Story of Ideas in America* (2001).

109. For example, Robert G. McCloskey, *American Conservatism in the Age of Enterprise, 1865-1910* at 26-30 (1951); Richard Hofstadter, *Social Darwinism in American Thought* 60-63 and passim (rev. ed. 1959); Sydney Fine, *Laissez Faire and the General Welfare State* 84-85 (1964). Henry S. Commager, *The American*

fashionable to use Social Darwinism as the paradigm for explaining liberty of contract, or the general laissez faire position of the Supreme Court after the turn of the century.¹¹⁰

Nonetheless, one viewing mainstream legal writing during this period is struck by the *absence* of reference to Darwin or to Social Darwinist rhetoric.¹¹¹ Historians have been quite willing to assign a cause for the legal revolution of the turn of the century that has only the thinnest support in the writings of the legal scholars themselves. For example, Holmes' professional career stretched over more than sixty years, but his writing includes a scant half dozen references to Darwin, and even these are sufficiently ambiguous that scholars still debate about whether Holmes was in fact a Social Darwinist.¹¹² In his well-known *Lochner* dissent he accused the Supreme Court's majority of using the Fourteenth Amendment to "enact Mr. Herbert Spencer's Social Statics,"¹¹³ but with no evidence that any member of the Court had ever given either Darwin or Spencer a single thought.

Mind 359-373 (1950). See also Edward S. Corwin, *Court Over Constitution* (2d ed. 1950); Bernard Schwartz, *The Supreme Court: Constitutional Revolution in Retrospect* (1957).

110. For example, Paul Kens, *Judicial Power and Reform Politics: the Anatomy of Lochner v. New York* 67-68 (1990). Contrast Herbert Hovenkamp, *The Political Economy of Substantive Due Process*, 40 *Stan.L.Rev.* 379 (1988). For another effort to minimize the role of Social Darwinism, see Michael J. Phillips, *The Lochner Court, Myth and Reality: Substantive Due Process from the 1890s to the 1930s* (2000).

111. For example, see A. Paul, *Conservative Crisis and the Rule of Law: Attitudes of Bar and Bench, 1887-1895* at 22 & n. 10 ([1960] rep. ed. 1976), who, while attributing the rise of laissez faire conservatism among lawyers to Social Darwinism, concedes that although he read hundreds of lawyers' speeches, nearly none of them contained references to Herbert Spencer, the great popularizer of Social Darwinism.

112. On the theory of evolution and Holmes, see Holmes, *Law in Science and Science in Law*, 12 *Harv. L. Rev.* 443, 449 (1889); Holmes, *Primitive Notions in Modern Law*, 10 *Am. L. Rev.* 422, 429-30 (1876). On Holmes's Darwinism, see Albert W. Alschuler, *Law Without Values: The Life, Work and Legacy of Justice Holmes* (2000); J.W. Burrow, *Holmes in His Intellectual Milieu*, 17, 25, in *The Legacy of Oliver Wendell Holmes, Jr.* (Robert W. Gordon, ed. 1992); Jan Vetter, *The Evolution of Holmes, Holmes and Evolution*, 72 *Calif. L. Rev.* 343 (1984); E. Donald Elliott, *Holmes and Evolution: Legal Process as Artificial Intelligence*, 13 *J. Legal Stud.* 113 (1984); Herbert Hovenkamp, *Evolutionary Models in Jurisprudence*, 64 *Tex.L.Rev.* 645 (1985).

113. *Lochner v. New York*, 198 U.S. 45, 75 (1905).

The Darwinian approach did show up in Progressive Era economic theory, but it was in leftward leaning institutionalism rather than marginalism.¹¹⁴ The evolutionary approach to economics reflected in institutionalism largely eschewed mathematical theory in favor of detailed description and historical development. In economics these concerns eventually became central to the work of such institutionalists as Thorstein Veblen, John R. Commons, and Wesley Mitchell, all of whom yearned for a more evolutionary approach to economics. They spent much of their lives accounting for the ways in which economic actors departed from presumed rational behavior.¹¹⁵

Marginalists at the turn of the century, when basic models for the social sciences were being formed, faced the criticism that marginalism was based on a narrow view of humanity that did not take biological evolution into account. Thorstein Veblen criticized marginalist economics for not being an "evolutionary" science.¹¹⁶ Marginalist economics stripped humanity down to a set of utility functions that equated human behavior with desire and completely ignored inherited characteristics. To be sure, the theory of evolution was just as reductionist, recasting desire as nothing more than the instinct to survive. But the two models developed fundamentally different, even mutually exclusive, mechanisms for determining appropriate social policy. The differences showed up most starkly in theories about controlling deviant behavior and criminality. Marginalists would control crime by creating liberty or financial incentives that regulated the behavior of human beings as autonomous actors. By contrast, the Darwinians would control criminal behavior by identifying those "types" that were thought to be prone to it, and then using sterilization or other means to ensure that they could not reproduce their kind. What is often unappreciated today is the extent to which both models

114. See Geoffrey M. Hodgson, *The Evolution of Institutional Economics: Agency, Structure, and Darwinism in American Institutionalism* (2004). The classic study of the difference between institutional and neoclassical economics is David Hamilton, *Evolutionary Economics: A Study of Change in Economic Thought* (1953).

115. See Herbert Hovenkamp, *The First Great Law and Economics Movement*, 42 *Stan.L.Rev.* 993 (1990).

116. Veblen, *Why is Economics Not an Evolutionary Science*, 12 *Q.J.Econ.* 384 (1898). Legal Realist Walton Hamilton echoed the criticisms a generation later. See Walton H. Hamilton, *The Institutional Approach to Economic Theory*, 9 *Am.Econ.Rev.* 309 (1919).

guided Progressive Era policy making.¹¹⁷

One important difference between marginalist and Darwinian models was the degree of empirical content. Darwinian investigations were heavily empirical and during the post-Civil War and Progressive Era produced detailed empirical studies into subjects such as the source of criminality, degeneration, social control, and the like.¹¹⁸ In economics, institutionalism tended to yield detailed historical studies of particular industries or firms. By contrast, marginalism as a concept was heavily driven by mathematics and had no empirical content at all. Marginalism accounted for the behavior of a theoretical "rational" actor or profit-maximizing firm. Any questions about the extent to which people or firms fail to act rationally were relegated to the fringes of economic science.

Berle and Means' *Modern Corporation and Private Property*¹¹⁹ reflected this evolutionary approach, with its focus on empirical detail and its emphasis on the extent to which corporations departed from the norms of rational behavior -- such as the famous discussions about inefficiencies that result from the separation of ownership and control. As other institutionalist writings, Berle and Means was heavily historical and drawn to classical rather than neoclassical theories of value.¹²⁰

The contrast could not be bolder. For Berle and Means the corporation was a potentially harmful institution, often acting contrary to the public interest but -- even more ominously -- often acting contrary to its own best interests because management did not have the owners' interests at heart. In contrast, the marginalist corporation was a unified economic actor whose every action was understood in terms of profit maximization.

117. See, e.g., Mark Haller, *Eugenics: Hereditarian Attitudes in American Thought* (1963, repr. New Brunswick, 1984); Donald Pickens, *Eugenics and the Progressives* (Nashville, 1966).

118. See, e.g., Richard Dugdale, *The Jukes: A Study in Crime, Pauperism, Disease and Heredity* (3d ed. 1877). And See Michael Willrich, *The Two Percent Solution: Eugenic Jurisprudence and the Socialization of American Law, 1900-1930*, 16 L. & Hist. Rev. 63 (1998); Herbert Hovenkamp, *Evolutionary Models in Jurisprudence*, 64 Tex.L.Rev. 645 (1985); Herbert Hovenkamp, *Insanity and Criminal Responsibility in Progressive America*, 57 N.Dak.L.Rev. 541 (1981).

119. Adolf A. Berle and Gardiner C. Means, *The Modern Corporation and Private Property* (1932). On the writing of *The Modern Corporation*, see Thomas K. McCraw, *In Retrospect: Berle and Means*, 18 *Reviews in Am.Hist.* 578 (1990).

120. On institutionalism as an economics movement in the United States, see Hovenkamp, *First Great Law and Economics Movement*, note ___, at 1013-1030.

Indeed, marginalists tended to cast aside as irrelevant evidence that corporations did in fact act in ways that seemed contrary to their own best interests.

Neoclassicism and the Separation of Ownership and Control

Berle and Means' *Modern Corporation* remains to this day a critically important historical artifact in the law of corporations. It is widely cited, although perhaps negatively as often as positively. Undoubtedly pre-War Institutionalism's most enduring legacy has been Berle and Means, and the "separation of ownership and control" will forever be associated with their names, even though the idea originated in Thorstein Veblen's *Absentee Ownership* a decade earlier.¹²¹

In contrast, the more general pre-war institutionalist movement has died out and largely been forgotten. Mainly, the institutionalists were excessively empirical, much too concerned with factual detail, and unable to devise useful theory with predictive power. The institutionalists certainly had a point when they insisted that economics cannot be separated from social science, history and even evolutionary biology. But in the process of attempting to incorporate everything they gave up too much of the elegance that neoclassicism's rational expectations models produced.¹²²

121. Thorstein Veblen, *Absentee Ownership and Business Enterprise in Recent Times: the Case of America* (1923). On the book's unfortunate history see Rosalind Schulman, *Absentee Ownership Reread*, 21 *Am.J. Economics & Sociology* 319 (1962) (reviewing Wesley Mitchell's "Lectures Notes on History of Economic Thought, 1934-1935").

122. Institutionalism's modern stepchild is the much more technical New Institutional Economics (NIE), which combines neoclassical methodologies, including its mathematics, with an increased appreciation of institutions and a positive research agenda. See Oliver E. Williamson, *The new Institutional Economics: Taking Stock, Looking Ahead*, 38 *J.Econ.Lit.* 595 (2000). See also Kenneth J. Arrow, "Reflections on the Essays," in *Arrow and the Foundations of the Theory of Economic Policy* 727-734 (1987) (contrasting the old and new institutional economics and giving a similar explanation about why the old institutionalism failed).

For overviews see *Handbook of New Institutional Economics* (Claude Menard and Mary M. Shirley, eds., 2005); Eirik G. Furubotn and Rudolf Richter, *Institutions and Economic Theory: The Contribution of the New Institutional Economics* (1997); Thrainn Eggertsson, *Economic Behavior and Institutions* (1990).

But in fact the separation of ownership and control is not a distinctively institutionalist notion. It was embraced equally by marginalist neoclassicists. The important difference was attitude. For Berle and Means as well as Veblen, the separation of ownership and control was a serious economic and social problem, explaining why corporations did not act in either the interests of their shareholders or the public interest. In sharp contrast, neoclassicists embraced the separation of ownership and control as a fundamental principle of efficient firm behavior. Indeed, in the neoclassical model separation of ownership in control has become a virtual prerequisite to productive management and risk taking.¹²³

The intellectual vehicle for neoclassicism's embrace of the separation of ownership and control was price theory. After an early period in which welfare economics and price theory were regarded as concerned with a common set of questions about efficiency and wealth distribution, the "ordinalist" revolution separated them.¹²⁴ Welfare economics became concerned with individual utility preferences under the constraint that utilities could not be quantified in a cardinal matter and interpersonally compared. By contrast, price theory was concerned entirely with the maximization of wealth measured in a constant monetary unit such as dollars. Critically, neoclassical price theory gives no regard to the observation that individual utility preferences might differ from wealth preferences, and for measuring market behavior this has proven to be a very powerful assumption. Under marginalism, and in contrast to the work of Veblen or Berle & Means, neoclassical corporate finance theory unambiguously became a part of price theory, not a part of welfare economics. Once made, that decision guaranteed that the idiosyncratic preferences of shareholders would be irrelevant within the neoclassical model.

An essential tenet of neoclassical theory was that a business firm, as any economic actor, maximizes profits, or value. Further, value maximization is indifferent to the identity and distribution of either shareholder or manager identity. The entire thrust of neoclassical corporate finance theory was to turn the shareholder into nothing more than an investor, who was presumed to have no interest other than the maximization of value, no matter what his or her actual interest might be.

123. See, e.g., Eugene F. Fama and Michael C. Jensen, Separation of Ownership and Control, 26 J.L. & Econ. 301 (1983); Mark J. Roe, Strong Managers, Weak Owners: the Political Roots of American Corporate Finance (1994).

124. Robert Cooter and Peter Rappoport, Were the Ordinalists Wrong about Welfare Economics?, 22 J.Econ.Lit. 507 (1984).

The manager became nothing more than the agent of profit-maximizing decision making. Until the rise of agency cost models, which did not occur until after 1960, neoclassicism largely assumed the ownership/control problem away by positing that both the firm and its shareholders had only profit-maximization in mind.¹²⁵

The neoclassical model simply assumed profit-maximization, quite apart from the wishes of managers, shareholders, creditors or anyone else that might be associated with a corporation. Already in the first decade of the twentieth century the brilliant Yale neoclassicist Irving Fisher worked out the beginning details of what was to become his "separation theorem."¹²⁶ Fisher assumed that shareholders have utility preferences that are not capable of being specified. He then showed that in an efficient market for capital a business firm will choose value maximization as a strategy regardless of shareholders' utility preferences for dividends or reinvestment or their preferences as to how profits should be spent.¹²⁷ The basic logic of the theorem is that the goal of the firm is always to maximize the size of overall returns, which thus gives the shareholders in the aggregate the maximum opportunity to spend the profits as they please.¹²⁸

125. See Harold Demsetz, *The Structure of ownership and the Theory of the Firm*, 26 J.L. & Econ. 387 (1983). See also George J. Stigler and Claire Friedland, *The Literature of Economics: the Case of Berle and Means*, 26 J.L. & Econ. 241 (1983).

126. Fisher worked the fundamental theory out in Irving Fisher, *The Nature of Capital and Income* (1906) and *The Rate of Interest* (1907), but he presented the mature theorem in Irving Fisher, *The Theory of Interest: As Determined by the Impatience to Spend income and Opportunity to Invest it* (1930).

127. One statement of the theorem is:

Given perfect and complete capital markets, the production decision is governed solely by the profit-maximization objective, and the decision is separated from the consumption decision that is governed solely by utility-maximization.

For a moderately technical explanation of the theorem see "Irving Fisher's Theory of Investment," available at <http://cepa.newschool.edu/het/essays/capital/fisherinvest.htm>. See also Richard A. Brealey, Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance* (8th ed. 2006).

128. See Remus D. Valsan & Moin A. Yahya, *Shareholders, Creditors, and Directors' Fiduciary Duties: A Law and Finance Approach*, 2 Va. L. & Bus. Rev. 1, 35-36 (2007).

Today, Fisher's separation theorem is regarded as a building block for the more general Modigliani-Miller (MM) theorem of corporate finance, developed in the 1950s, which states that in an efficient market for capital a firm's value is not a function of the way it is financed -- i.e, its ratio of debt to equity. In this model the number, identity, or interests of shareholders became entirely irrelevant when the conditions of the theorem were satisfied.¹²⁹

Neoclassical theory also recognized that firms might make inefficient choices, but it came to do so in the guise of "agency" costs. While a transaction cost is a cost of using a market, or producing an exchange between two independent actors, an agency cost is a cost of making a decision within the firm.¹³⁰ For example, while neoclassicism saw nothing inherently inefficient in the separation of ownership and control, to the extent such separation did lead to inefficiencies they would be characterized as agency costs. One value of the great theorems of corporate finance, such as Fisher's separation theorem or the Modigliani-Miller theorem is that they worked in a market where agency costs were

129. Franco Modigliani and Merton H. Miller, *The cost of Capital, Corporation Finance and the Theory of Investment*, 48 *Am.Econ.Rev.* 261 (1958). See Franco Modigliani, 3 *The Collected Papers of Franco Modigliani* xiii (1980, A. Abel ed.):

with well-functioning markets (and neutral taxes) and rational investors, who can 'undo' the corporate financial structure by holding positive or negative amounts of debt, the market value of the firm - debt plus equity - depends only on the income stream generated by its assets. It follows, in particular, that the value of the firm should not be affected by the share of debt in its financial structure or by what will be done with the returns - paid out as dividends or reinvested (profitably).

Relatedly, see Harold Demsetz, *The Structure of Ownership and Control and the Theory of the Firm*, 26 *J.L. & Econ.* 375 (1983) (corporate performance does not depend on identity or configuration of shareholders); Harold Demsetz and Belen Villalonga, *Ownership Structure and Corporate Performance*, 7 *J.Corp.Fin.* 209 (2001) (shareholders will eventually adopt the ownership for that maximizes returns).

130. The classic treatment is Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 *J. Fin. Econ.* 305 (1976). See also Ronald J. Gilson, *Controlling Shareholders and Corporate Governance: Complicating the Comparative Taxonomy*, 119 *Harv. L. Rev.* 1641, 1651 (2006); Armen A. Alchian and Harold Demsetz (1972). *Production, Information Costs, and Economic Organization*, 62 *Am.Econ.Rev.* 777 (1972). For an excellent brief explication of the relationship between transaction costs in markets (separate economic actors) and agency costs within the firm, see Richard A. Posner, *Economic Analysis of Law* 408, 416-418 (6th ed. 2003).

zero. As a result, observers could identify problems with possible legal solutions by inquiring into situations where these costs were positive.¹³¹ As a result, agency costs performed the same role within the firm that transaction costs performed in the market -- by determining where legal policy could make a difference and then assigning legal entitlements in such a way so as to ensure wealth maximizing outcomes.¹³²

Competition and Equity Markets: the Efficient Capital Market Hypothesis

The earliest neoclassical theorems in corporate finance, such as Irving Fisher's separation theorem, assumed that capital markets were efficient. In fact, the roots of the modern Efficient Capital Market Hypothesis were developed in neoclassical marginalism early on. As William Stanley Jevons observed already in the 1870s,¹³³ people tend to equate their utilities: they purchase a good until the marginal utility of that good declines to the level they experience for some other good. The corollary in finance is that people equate their returns. Stocks became investment vehicles whose prices were calculated to produce the same level of return, once adjusted for risk.¹³⁴

One very important difference between classical and neoclassical value theory lay in the treatment of risk and uncertainty. Because classicism measured value by looking at past averages, the theory did not explicitly incorporate the risk of uncertain future events. Things such as the value of labor or of a business firm were measured by reference to previous investment, and risk of future events did not formally fit into the theory. To be sure, business persons investing in the nineteenth century certainly took anticipated risks into account, but the classical value model did not account for them.

In very sharp contrast, marginalism's criteria of willingness-to-pay,

131. See Douglass C. North, Comment on Stigler and Friedland, 26 J.L. & Econ. 269 (1983) (arguing that Berle and Means were in fact the first to address the problem of agency costs within the corporation, and did so long before anyone else did so; noting that Ronald Coase, *The Nature of the Firm*, 4 *Economica* 386 (1937), was published five years later).

132. The Coase Theorem operates to like effect in markets. See Ronald Coase, *The Problem of Social Cost*, 3 J.L. & Econ. 1 (1960).

133. See discussion *supra*, text at notes ____.

134. See, e.g., Frank H. Knight, *Risk, Uncertainty, and Profit* 64-66 (1921).

or expected value, almost always involved a certain amount of uncertainty. For longer run investments or less stable markets the uncertainty could be considerable. Figuring out how to accommodate uncertainty about the future into economic modeling proved to a central problem of neoclassical economics in the first half of the twentieth century.

Before modern corporate finance theory could emerge several things had to be worked out. *First*, marginalism had to develop a robust theory of competition. Because of its forward looking nature that was a theory in which information, risk, and uncertainty acquired heightened importance. *Second*, this theory had to be applied to the corporate equity market. *Finally*, this theory, coupled with a set of empirical studies of commodity and stock market behavior, led to the formulation of the Efficient Capital Market Hypothesis.

The initial impact of marginalist economics was a great deal of doubt about the competitiveness and even the robustness of markets, and many of the earliest marginalists abandoned the commitment to free markets that was explicit in classical political economy. Some even toyed with socialism as an alternative to free markets.¹³⁵ Prominent neoclassicists backtracked considerably from the classical hostility toward economic regulation.¹³⁶ Major technical controversies within neoclassical economics served to create significant doubts about the efficiency of markets.¹³⁷

Gradually neoclassicism was able to work out the details of a more-or-less robust model of competition, although the domain of so-called "perfect competition" within marginalism was never as broad as the classicists faith that strenuous competition prevailed in virtually every market. The neoclassicists had to deal with numerous complexities that the marginalist model contemplated, such as increasing returns to scale,

135. See John W. Mason, *Political Economy and the Response to Socialism in Britain, 1870-1914*, 23 *Historical J.* 565 (1980).

136. See William S. Jevons, *The State in Relation to Labour* 1-21 (1882). See also Henry Sidgwick, *The Principles of Political Economy* 518-544 (1887) (prominent marginalist criticizing laissez faire position of the classicists). On the attitudes of early marginalists toward wealth distribution see Robert Cooter and Peter Rappoport, *Were the Ordinalists Wrong about Welfare Economics?*, 22 *J.Econ.Lit.* 507 (1984).

137. See Herbert Hovenkamp, *Enterprise and American Law, 1836-1937*, at chs. 22-25 (1991); and see, e.g., Joan Robinson, *The Economics of Imperfect Competition* (1933); Edward Chamberlin, *Theory of Monopolistic Competition* (1933).

which gave larger firms a cost advantage over smaller ones,¹³⁸ and product differentiation, which generally made marginal cost pricing unworkable.¹³⁹ In addition, marginalist corporate finance theory had to work out some important problems regarding the relationship between a business firm's market incentives, its selection of sources of capital, and the possibly quite separate incentives of its stockholders. The Fisher separation theorem discussed above was an important first step.

As the modern neoclassical model of perfect competition developed through the first half of the twentieth century the role of information became increasingly important. Perfect competition depended on markets with a fairly large number of buyers and sellers, lack of significant scale economies, and the free flow of information. University of Chicago economist Frank Knight stressed it in his important 1921 book *Risk, Uncertainty and Profit*, which identified the costless flow of information as a precondition to effective competition.¹⁴⁰ In addition, Knight introduced the concepts of risk and certainty as inherent in marginalism's emphasis on reasonable expectations. For Knight "risk" referred to variations in the future whose probability was knowable. With good foreknowledge of probabilities risks could be traded under competitive conditions. For example, a precisely one in ten chance of making a \$1000 oil discover is worth \$100. In contrast, "uncertainty" referred to future events whose probability could not be known. In such cases investors would demand a premium as compensation for exposure to an adverse outcome whose chance of occurrence was unknowable.

Many of the early marginalists viewed the stock market with suspicion, regarding it as not conforming to the usual laws of supply and demand. Certainly the boom-bust stock price cycles of the late nineteenth and early twentieth century served to frustrate application of basic competition theory to stock pricing. Prices appeared to gyrate wildly, with no apparent relation to the value of the underlying firm.¹⁴¹ Under this

138. See Henry Carter Adams, "Relation of the State to Industrial Action," 1 *Pub., Am. Econ. Assn.* 7, 52, 59-64 (1887) (arguing that industries subject to significant scale economies must be regulated by the government). See also Hovenkamp, *Enterprise*, note ___ at Ch. 23.

139. See Chamberlin, note ___.

140. Frank H. Knight, *Risk, Uncertainty, and Profit* 78-87 (1921).

141. See, e.g., John Maynard Keynes, *General Theory of Employment, Interest and Money*, Ch. 12 (1936) (arguing that stock market operates as a kind of "beauty contest" in which shares prices were based not on fundamental value but

line of thinking technical analysis flourished, with stock traders hoping to pick winners by trying to find predictable similarities in past pricing behavior.¹⁴²

But a more theoretical purist strand in neoclassical economics developed the view that, notwithstanding the frenzy with which stocks are often purchased and sold, overall pricing tends to reflect fundamental values. For example, Yale economist Irving Fisher, author of the separation theorem, consistently argued that stock prices reflected intrinsic values in which returns to stocks operated as an "implied" rate of interest in which owners were compensated with higher returns in exchange for taking on greater risk.¹⁴³ John Burr Williams also insisted that the price of shares reflected the intrinsic value that they represented -- namely, objectively reasonable expectations of future earnings and dividends. Mathematically, the value of a corporation is the expected value of its stream of future earnings.¹⁴⁴ Building on Williams' work, University of California economist Harry Markowitz then developed the idea that the development of an optimal portfolio of stocks consists in selecting stocks of differing risk levels, and that riskier investments were offset by higher rates of return, although greater variability as well.¹⁴⁵

The efficient capital market hypothesis was very much constructed

rather one each buyer's prediction of what valuation others would place on a firm's shares). See also John Hicks, *Value and Capital: An Inquiry into some Fundamental Principles of Economic Theory* (1939); Robert Rhea, *The Dow Theory* (1932).

142. See Lawrence E. Mitchell, *The Speculation Economy: How Finance Triumphed over Industry* 274 (San Francisco: BK Pub., 2007).

143. Irving Fisher, *The Rate of Interest* 10 (1907) (speaking of an "implied rate of interest" in stocks that reflect the investor's anticipation of returns; see also *id.* at 216, on the differential returns of stocks and bonds, noting that the intrinsic value of stocks is such as to produce a higher rate or return because they are also accompanied by more risk). More than two decades later Fisher returned to the same themes. Irving Fisher, *The Theory of Interest: As Determined by the Impatience to Spend Income and Opportunity to Invest It* (1930).

See also Benjamin Graham and D.L. Dodd, *Security Analysis: Principles and Technique* (1951) (emphasizing a strategy of "value investing" by studying fundamentals in search of undervalued stocks).

144. John Burr Williams, *Theory of Investment Value* (1938).

145. See Harry Markowitz, *Portfolio Selection*, 7 *J.Finance* 77 (1952).

on the marginalist theory of perfect competition, in which every market participant is a price taker and the price of a stock quickly moves toward an equilibrium that tends to equalize its risk adjusted return to that of other stocks and financial instruments.¹⁴⁶ The thinking developed in stages, from the observation that returns at the margin will be equalized; to the observation that to the extent the market discounts all information about a stock into the price the current price is always the "correct" one; to the observation that even high risk and low risk stocks should produce the same return in the long run because high risk will be compensated through a stock price that yields a higher return.¹⁴⁷ As a result, any randomly selected mixture of stocks should perform just as well as any other similarly diversified mixture.

From that point the only missing ingredient was informational efficiency -- or the idea that the market price of a security is a reflection of the information that is publicly known about it. To the extent that information is both accurate and relatively quickly disseminated this price will tend to reflect rational expectations about fundamental value.¹⁴⁸ Already in 1900 Louis Bachelier, a French mathematician, had written a doctoral dissertation entitled *The Theory of Speculation*, arguing that the history of commodity prices shows that they are in fact randomly distributed, making it impossible to predict future prices from past price

146. See Jean-Jacques Laffont and Eric S. Maskin, The Efficient Market Hypothesis and Insider Trading on the Stock Market, 98 J.Pol.Econ. 70 (1990), who notes that the ECMH assumes nearly perfect competition and breaks down under oligopoly, where prices and the release of information may be strategic. If transaction costs are positive or there are serious asymmetries in information then various versions of the hypothesis may not apply.

147. Harry Markowitz, Portfolio Selection, 7 J.Fin. 77 (1952).

148. Eugene F. Fama's doctoral dissertation, often credited with assembling the data and proofs that created the modern efficient market hypothesis, was published as Eugene F. Fama, The Behavior of Stock-Market Prices, 38 J.Bus. 34 (1965). See also Eugene F. Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 J.Finance 383 (1970) (initially proposing the "strong," "semi-strong" and "weak" forms of the efficient market hypothesis. See also Eugene F. Fama, Efficient Capital Markets II, J. Finance 1575 (1991); Eugene F. Fama, Foundations of Finance (1976). See also Sanford Grossman, The Informational Role of Prices (1989).

On the history of the efficient market hypothesis, see Michael C. Jensen and Clifford W. Smith, Jr., The Modern Theory of Corporate Finance 2-20 (1984).

histories.¹⁴⁹ Beginning in the 1930s a number of studies suggested the same thing for stock prices.¹⁵⁰ For example, detailed recording of a series of throws of a single die provides information that there is a one in six chance of getting a five, but no sequence in historical throws provides any useful information about predicting a sequence in future throws. As a result an efficient investor might as well forget the research and purchase shares without even a minimal knowledge of a firm's business or its prospects.

In his now famous doctoral dissertation Eugene Fama assembled this theory about competition, information dispersion as well as the empirical studies of pricing behavior into what has become known as the efficient capital market hypothesis (ECMH). The hypothesis states in its most generalized version that in any market in which information flows without restraint current market prices reflect investors' collective beliefs about the value of the goods that are being traded. While ECMH can be applied to any market that satisfies its conditions and has frequently been applied to commodities markets,¹⁵¹ its main impact has been in the analysis of stock market pricing. The ECMH comes in three versions: weak, semistrong, and strong. The weak version states that current prices reflect all the information contained from observations of previous investment prices. As a result, historical pricing information is not useful for predicting future pricing, making so-called "technical" analysis from price movements useless as a predictor of future prices. Under the semistrong version current prices reflect all public information, including technical information but also information pertaining to "fundamentals," which is information about the performance and prospects of a firm, its assets and liabilities, P/E ratio, and the like. If you learn something about a firm in the newspaper the market price has already reflected that news and trading on

149. Louis Bachelier, *The Theory of Speculation* [1900] (reprint edition, Princeton Univ. Press, 2006).

150. See Holbrook Working, *A Random Difference Series for Use in the Analysis of Time Series*, 29 *J. Am. Statistical Assn.* 11 (1934) (stock prices appeared to move randomly, making technical forecasting impossible); Alfred Cowles, *Can Stock Market Forecasters Forecast*, 5 *Econometrica* 309 (1933) (concluding that professional stock pickers did not do better than a random walk in selecting stocks for their clients); Alfred Cowles and H.E. Jones, *Some A Posteriori Probabilities in Stock market Action*, 5 *Econometrica* 280 (1937) (similar). See Maurice G. Kendall, *The Analysis of Economic Time-Series*, 96 *J. Royal Statistical Soc.* 11 (1953) (similar).

151. E.g., Roger W. Gray and David J.S. Rutledge, *The Economics of Commodity Futures Markets: A Survey*, 39 *Rev. Marketing Agricultural Econ.* 3 (1972).

it is of no use. Further, there is no point studying a firm's fundamentals in order to identify under- or over-valued stocks. Thus neither technical analysis nor fundamental analysis will work. Finally, the strong form adds to this that even private information is discounted into the stock price. As a result even information from such activities as insider trading will be included.¹⁵²

Both the strong and the semistrong strong version of EMCH have strong policy implications for corporate disclosure and finance. Principally, the mitigate strongly against hard regulation, although in favor of disclosure of information.¹⁵³ With respect to information, mandatory disclosure is more important for smaller companies than for larger publicly traded companies that are likely to be followed by a large number of analysts.¹⁵⁴ In general, the amount of regulation of information that should be supplied varies inversely with the amount of information actually available and disseminated by private analysts.¹⁵⁵ Finally, the type of financing a firm chooses, or its production or expansion decisions will always be reflected in the market price, thus making command-and-control regulation largely unnecessary.¹⁵⁶

152. See Stephen A. Ross, Randolph W. Westerfield & Jeffery F. Jaffe, *Corporate Finance* 352-57 (7th ed. 2005).

153. See Charles R. Plott, *Markets as Information Gathering Tools*, 67 *S.Econ.J.* 1, 9-10 (2000).

The Supreme Court approved what amounted to the semistrong form of ECMH in *Basic, Inc. v. Levinson*, 485 U.S. 224 (1988). It had been applied previously in many circuits. See, e.g., *Blackie v. Barrack*, 524 F.2d 891 (9th Cir. 1975), cert. denied, 429 U.S. 816 (1976). On the *Basic* litigation and the reaction, see Joel Seligman, *The Transformation of Wall Street* 660-665 (3d ed. 2003). On this history of the fraud on the market hypothesis in litigation prior to *Basic*, see Barbara Black, *The Strange Case of Fraud on the Market: A Label in Search of a Theory*, 52 *Alb.L.Rev.* 923 (1989).

154. See Jeffrey N. Gordon and Lewis A. Kornhauser, *Efficient Markets, Costly Information, and Securities Research*, 60 *N.Y.U.L.Rev.* 761, 810-811 (1985).

155. *Ibid.*

156. Further, the Modigliani-Miller theorem shows that in a perfectly functioning capital market with no transaction costs the value of a firm is independent of its ratio of debt to equity. See Franco Modigliani & Merton H. Miller, *The Cost of Capital*, note ____.

Conclusion: the Separation of Ownership and Awareness:

The result of marginalist finance theory was to take Berle and Means' separation of corporate ownership and control one step further, to the separation of ownership and awareness. In an efficient capital market investors can maximize their returns without even knowing anything about the products a firm makes or the markets in which it operates. A random selection of stocks produces the same return as the most careful research.¹⁵⁷ Indeed, under the strong version of ECMH even the actions of managers become irrelevant because they will immediately be reflected in the stock price as well. The effect was to move the shareholder in the publicly traded corporation to the furthest extent possible from the nineteenth century vision of the classical corporation as a device for limiting liability and facilitating investment by a group of active owner-operators.

157. See Donald R. Stabile, *Forerunners of Modern Financial Economics: A Random Walk in the History of Economic Thought, 1900-1950* (2005).