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Intangible Assets and Stock Prices in the Pre-*SEC* Era

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1. *Introduction*

In this paper we investigate the relation between intangible assets and stock prices under a reporting regime which permits considerable flexibility for managers to capitalize such assets.[1] Our primary sample consists of 146 industrial corporations traded on the New York Stock Exchange (*NYSE*) which reported material amounts of intangible assets on their 1927 balance sheets. At that time, managers could capitalize a broad range of intangibles and determine subsequent amortization and revaluation policies.

We estimate cross-sectional models where intangibles play two possible roles in equity valuation. The first is a direct role where they map positively into share price. If investors perceive intangibles to be legitimate assets, we predict a positive relation between their carrying values and stock price. The second is an interactive role where the level of capitalized intangibles conditions investor evaluation of reported earnings. If investors view capitalized intangibles as an indicator of cost deferrals which should have been expensed, then the earnings–intangibles interaction will

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[1] This paper is dedicated to Nick Dopuch, an extraordinary person whose wisdom and insights have greatly benefited the accounting research community.

be negatively related to price, suggesting that the coefficient mapping earnings into price declines in the level of capitalized intangibles.[2]

Our tests, based on sample-wide valuation models, provide no evidence of a significant positive relation between capitalized intangibles and share prices. We do find evidence that the coefficient relating earnings to share price decreases with the level of capitalized intangibles, consistent with a perception by investors that managers may be overstating earnings through intangibles capitalization. We also document that separate reporting for intangible assets strengthens the relation between price and summary balance sheet measures. Book value is not significantly related to share price, but the coefficient mapping tangible book value into share price is positive and highly significant when intangibles are disaggregated from book value.

These findings raise two issues which we address with additional tests. The first is whether carrying values for intangibles are positively related to price for firms where intangibles may be subject to more reliable measurement, either due to the nature of external audit review, the type of asset, or the extent to which carrying values are subject to amortization and/or revaluation. A second issue concerns interpretation of the significant negative earnings–intangibles interaction. Namely, does this effect reflect a correlated omitted variable, and does it imply that firms' stock prices are lower merely because they separately report intangibles rather than aggregate them with other assets?

Results of these tests indicate four main findings. First, the provision of audited financial statements or attestation by a large auditor has no effect on the coefficient mapping intangibles into price, but firms audited by the largest auditor of the era (Price Waterhouse) have a significantly lower intangibles-related discount applied to their earnings. Second, we find some evidence that rights-based intangibles (e.g., patents and trademarks) or intangibles showing declines in carrying value (e.g., due to amortization or revaluation) are positively priced. However, the net effect of intangibles on price is ambiguous for these firms since the earnings–intangibles interaction remains negative and significant.

Third, tests for correlated omitted variables related to risk and earnings management incentives suggest that the negative earnings–intangibles interaction is not driven by exclusion of these factors from our initial cross-sectional model. Finally, the negative earnings–intangibles interaction should not be interpreted as suggesting that firms are necessarily penalized with lower stock prices by providing separate disclosure of intangibles on their balance sheet. We find that the overall coefficient mapping earnings into stock price is higher for our sample firms compared with firms reporting no separate intangibles on their balance sheet.

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[2] As we discuss in section 2, pre-*SEC* firms frequently wrote off intangibles directly against surplus and avoided future amortization charges altogether. Hence, the capitalization of costs with a subsequent write-off to surplus avoided charges to both current and future earnings.

Our results suggest that pre-*SEC* investors took a skeptical view of intangible assets. However, because of differences between the current institutional structure and that of the 1920s, our tests do not constitute a ceteris paribus analysis of the current impact of allowing managers greater flexibility in reporting the costs associated with intangibles. Rather, our evidence suggests that providing managers with increased opportunities to capitalize intangible assets may not unambiguously increase the amount of reliable information available to investors. Additional research is needed to identify more general conditions under which investors perceive capitalized intangibles to be legitimate assets.

We describe the motivation for our tests, the historical context for our study, and our primary hypotheses in section 2. Section 3 provides an overview of sample selection and data. Empirical results are reported in section 4. We briefly summarize the paper in section 5.

2. *Motivation, Historical Context, and Primary Hypothesis*

2.1 MOTIVATION FOR EMPIRICAL TESTS

Our tests investigate the relation between intangible assets and stock prices under the reporting regime in place prior to the establishment of the *SEC*. We conjecture that capitalized intangibles either convey information about future economic benefits (assets) and/or condition investor evaluation of the quality of reported earnings. The motivation for our analysis stems from recent discussions about appropriate accounting for intangibles, particularly those which are internally developed. Some assert that technological and economic changes of the past two decades have increased the importance of intangibles in firms' asset bases and that their current treatment under U.S. *GAAP* has reduced the usefulness of U.S. firms' financial statements (see Wallman [1995, pp. 85–86], Stewart [1997, pp. 18–36 and 55–64], and Lev and Zarowin [1999]).

One (but not the only) way for policymakers to address this issue would be to specify a broader range of conditions under which the costs associated with intangibles could be capitalized.[3] The *FASB* took this approach with *SFAS No. 86* on software development costs (see *FASB* [1985*b*]). Similarly, the International Accounting Standards Committee's (*IASC*) standard on intangible assets (*IAS No. 38*) recommends that firms using international standards capitalize the costs of several intangibles when the asset's cost can be reliably measured, an intangible asset controlled by the firm exists which is distinguishable from goodwill, and the asset is associated with probable future benefits (see *IASC* [1998]).[4]

The arguments supporting asset recognition for intangibles have not been universally accepted. For example, the trade association for security

[3] An alternative approach is supplemental disclosures about intangible asset values (see Wallman [1995, p. 86]).

[4] Under *IAS No. 38*, all basic research expenditures are expensed as are start-up costs and advertising. *IAS No. 38* also prohibits the recognition of several intangibles including brands, customer lists, and internally developed goodwill.

analysts has opposed the capitalization of internally developed intangibles by U.S. firms because they believe these assets cannot be reliably valued (see *AIMR* [1993, pp. 50–51]). While these views may be influenced by analysts' incentives, they are also consistent with assertions that the capitalization of intangibles' costs may not accurately measure the economic value of these assets and allowing capitalization provides greater opportunities to manage earnings.[5]

These competing views of intangible assets have motivated several studies investigating whether intangible asset values are positively related to share prices. For example, Aboody and Lev [1998] examine the value relevance of software development cost assets capitalized under *SFAS No. 86* and find these assets are positively and significantly related to stock prices. Other researchers have examined off-balance sheet measures of intangible asset values. Ittner and Larcker [1998] and Barth et al. [1998] document that intangible asset values are positively related to stock prices using measures of customer satisfaction and brand equity, respectively. Lev and Sougiannis [1996] find a positive relation between prices and estimates of *R&D* assets based on firm-specific research and development expenditures. However, this research does not address the more general question of how intangibles relate to price under a less prescriptive and less regulated reporting regime than current U.S. *GAAP*.

Our study is related to Barth and Clinch [1998] in that we also examine a setting that is less regulated than the current U.S. reporting regime. Barth and Clinch document a significant positive relation between capitalized intangibles (and their subsequent revaluations) and stock prices for Australian firms in a study directed at whether revaluations of financial, tangible, and intangible assets to fair value are priced by investors. By examining 1920s U.S. data, we can investigate the pricing of intangibles when managers have more reporting flexibility than under either current U.S. or Australian *GAAP*. Further, the historical focus of our study provides a richer context for understanding the evolution of U.S. reporting practices and investor attitudes regarding intangible assets.

2.2 HISTORICAL CONTEXT

Two aspects of pre-*SEC NYSE* industrials and their reporting policies for intangibles are important to understanding the historical context of our study. First, like the "high-tech" firms of recent years, early twentieth-century industrial corporations emerged and gained prominence after a period of major economic change and technological innovation which likely generated significant intangibles. Second, managers could report a broader range of intangible assets on the balance sheet than is permitted under current U.S. *GAAP*.

Large U.S. industrial corporations first emerged in the last quarter of the nineteenth century following technological changes akin to those ar-

[5] See Cottle, Murray, and Block [1988, pp. 302 and 317–18], Schilit [1993, pp. 77–96], Staley [1997, pp. 258–59], and Bernstein and Wild [1998, pp. 192–95].

gued by writers such as Stewart [1997] as having created modern technology-oriented firms.[6] The major industrials in the pre-*SEC* era likely developed several types of intangibles. The economic value of such assets derives from their relation to "abnormal" (or "excess") earnings (see Yang [1927] and Ohlson [1995]); intangibles contributing to these firms' earning capacity include (among others): managerial expertise, product innovation capabilities, establishment of brand equity arising from vertical integration, and economic goodwill associated with monopoly rents and scale economies (see Chandler [1977, pp. 272–81, 321–26, 364–76, and 426–33 for examples]).[7]

Lev and Zarowin [1999] hypothesize that economic and technological change increases the importance of intangibles in firms' asset bases and generates a demand for information on the value of such assets. Our tests provide evidence on whether such information is provided by financial statements in a period following significant technological change and relatively little regulation of financial reporting. As we document in section 3, the firms in our sample were priced at a premium over their tangible book value; this evidence is consistent with either the existence of significant intangibles or other tangible assets which are not recognized or are conservatively valued.

Pre-*SEC* industrial corporations operated free of constraints on reporting policies imposed by federal disclosure requirements and accounting standards. While the *NYSE* had required periodic reports through listing agreements as early as the 1890s, these agreements did not restrict accounting method choice until 1930 and did not require disclosure of accounting methods (see Schultz [1936, pp. 17–22]). Hence, to the extent that pre-*SEC* managers faced significant constraints on their reporting choices, these constraints derived from norms established in practice and enforced primarily through market arrangements.

To the extent that norms exist which define appropriate recognition and measurement criteria for intangible assets, and mechanisms exist

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[6] Improvements in energy sources transformed the United States from an agricultural into an industrial economy. These changes, coupled with developments in transportation, communications, and mechanical processes, led to the formation of the first large, publicly traded U.S. industrial companies (see Dewing [1992, vol. 4, pp. 33–55] and Chandler [1977, chaps. 9–11]). A parallel between the Industrial Revolution of the late nineteenth and early twentieth centuries and the Information Revolution of the late twentieth century has been noted by both academic and nonacademic writers—e.g., Jensen [1993, pp. 831–35], Stewart [1997, pp. 6–9], and Davis and Wessel [1998, pp. 21–55].

[7] The types of intangible assets described by 1920s writers are similar to those noted by recent authors. Both emphasize that intangibles as a class can be identified through earnings in excess of the normal return on tangible assets (see Saliers [1923, pp. 568–79], Yang [1927, pp. 87–102], and Stewart [1997, pp. 226–29]). As to specific intangibles, both mention customer satisfaction and brand equity (see Yang [1927, pp. 41–47] and Stewart [1997, 240–43]), human resources (see Yang [1927, pp. 47–51] and Stewart [1997, 230–33]) and new product development (see Yang [1927, pp. 77–86 and 163–72] and Stewart [1997, pp. 229–30]).

to monitor compliance with such norms, the ability of managers to manipulate earnings through cost deferrals is reduced. More specifically, if (1) norms evolved in practice (absent centralized standard-setting bodies like the *FASB*) to define clear conditions under which the costs of intangibles are recognized as assets, (2) reliable measurement rules exist to estimate an intangible asset's value, and (3) monitoring mechanisms (e.g., external auditors and other intermediaries) exist to detect and penalize noncompliance with norms, investors would likely perceive reported intangibles to contain relevant information for pricing common stocks. When these conditions do not hold, managers have flexibility (i.e., discretion) in reporting choices and can capitalize costs which should be expensed, or vice versa. Under these circumstances, investors may place little weight on intangibles' carrying values in pricing equity.

Reporting norms derived from practice may be broad or more narrowly focused on a specific reporting issue. An example of the former would be the definition of an asset provided in *SFAC No. 6* of the *FASB*'s "Conceptual Framework" (see paragraph 25 in *FASB* [1985*a*]). No analogous universal definition of an asset existed in the late 1920s. Some asserted that accounting practice implicitly adopted the view of an asset as an enforceable right to receive money, or services convertible into money (see Canning [1929, pp. 14–24]). However, it was also recognized that defining an asset in practice was difficult in some cases, one of which was goodwill (see Canning [1929, pp. 38–44]).

Early twentieth-century accountants conceded that both purchased and internally developed intangibles could be recognized, but these assets were perceived as difficult to measure since their economic value was often not distinguishable from goodwill (see Hatfield [1917, pp. 107–20], Saliers [1923, pp. 566–79], and Yang [1927, pp. 113–82]).[8] The use of cost as the measurement basis for intangible assets had long been recommended, but this recommendation was not universally followed (see Saliers [1923, p. 687] and Ripley [1927, pp. 190–92]). While measurement and classification of these assets was relatively straightforward when they were acquired in an arms-length transaction for cash, there were difficulties in valuing intangibles acquired in exchange for noncash consideration or developed internally.

The valuation of goodwill in corporate acquisitions paid for with common stock was particularly problematic (see Hatfield [1917, pp. 109–15]). Many major U.S. industrial firms formed prior to 1900 were combinations of existing entities whose owners were given stock in the newly formed entity. These firms often recorded large values for intangibles (usually goodwill) at their formation since the par value of new shares typically exceeded the tangible book value of the acquired entity. This problem was

[8] In contrast, current measurement technologies permit separate valuation of many specific types of intangible assets (e.g., Reilly and Schweihs [1998, chaps. 16–22]).

significantly reduced after 1912 when states began revising laws which had required high par values on equity shares.[9] By the late 1920s, it was believed that many firms had written off a substantial portion of these assets to income or surplus (see Graham and Dodd [1934, pp. 306–8 and 331–32]). Hence, early twentieth-century goodwill originating from stock swaps may be subject to concerns about unreliable valuations and opportunities for manipulation; such concerns have also been voiced in the current debate about capitalizing internally developed intangibles. Further, because the reporting of early twentieth-century goodwill does not indicate its origins, 1920s investors might view capitalized amounts for goodwill as questionable.

Early twentieth-century accountants used relatively broad definitions of the costs which could be capitalized for internally developed intangibles. Paton and Littleton [1940, p. 91] note that the costs of legal rights such as patents and copyrights could include costs associated with experimentation and development. During our sample period, costs associated with internally generated goodwill were also sometimes capitalized. These included advertising costs to build market share, early years' operating losses incurred in developing a business, and organization costs (see Yang [1927, pp. 157–59], Sanders, Hatfield, and Moore [1938, pp. 67–68], and Paton and Littleton [1940, pp. 31–33, 74, and 92]). The basis for capitalizing these costs as part of goodwill derived from the view that some intangibles could not be distinguished from goodwill (see Saliers [1923, pp. 573 and 584] and Yang [1927, pp. 17–18 and 59–60]).

Subsequent to initial capitalization, intangibles were often subject to amortization and/or periodic revaluation. Amortization was more likely for rights-based intangibles like patents since these assets have established legal lives (see Hatfield [1917, p. 118] and Sanders, Hatfield, and Moore [1938, p. 67]). However, rights-based intangibles were sometimes not amortized under the argument that they were permanent since renewals could extend the asset's life indefinitely (see Saliers [1923, p. 585] and Yang [1927, pp. 172–73]). The write-down of rights-based intangibles was recommended when their value declined or they became obsolete (see Paton and Littleton [1940, p. 91]). Write-ups were recommended only in exceptional circumstances where market values could be reliably ascertained (see Yang [1927, p. 166]).

Contemporary accountants believed that amortization of goodwill was unnecessary, but that goodwill should be subject to a periodic impairment test where declines in value were recognized (see Hatfield [1917,

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[9] Intangible assets were recorded at the firm's formation in lieu of establishing a discount on stock issued at less than par value since the discount would have to be eliminated through profits prior to the payment of dividends. Berle and Means [1932, pp. 123–46] describe the initial role of par values in the nineteenth century and their subsequent weakening through state court decisions. Dodd [1930] provides a comprehensive discussion of these "stock watering" practices.

pp. 115–17], Saliers [1923, pp. 580–85], and Yang [1927, p. 190]). Write-ups of goodwill were infrequent and seen as hard to justify (see Saliers [1923, pp. 585–86]). For all types of intangibles, revaluations were excluded from income and instead recorded directly in surplus (see Dillon [1979] and Walker [1992]).

Another difference between present practices and those in the pre-*SEC* era is the lack of supplementary disclosure requirements in the pre-*SEC* era. Some asserted that annual reports lacked transparency since it was difficult to ascertain the valuation basis and amortized amounts of many assets (see Ripley [1927, p. 194]). However, lack of supplemental disclosure does not necessarily imply that the reporting of intangibles' carrying values was perceived by investors as completely lacking transparency. Casual observation suggests that market forces substantially influenced how firms accounted for intangible assets. The practice of many industrials near 1900 was to aggregate intangibles with fixed assets (see Noone [1910] and Hatfield [1917, p. 117]). By the late 1920s, some firms had begun separately reporting intangibles at nominal amounts (e.g., $1), and this practice was praised by financial writers (see Sturgis [1925, p. 122]). Many financial statement users, especially creditors, were seen as preferring "clean" balance sheets free of intangibles (see Lough [1917, pp. 426 and 480], Lagerquist [1922, pp. 56 and 61], and Saliers [1923, p. 586]). Among firms that did not write intangibles down to nominal amounts, many began separately disclosing intangible asset values on the balance sheet.

One obvious constraint on managerial reporting choices in the pre-*SEC* era was the firm's external auditor (see Berle and Means [1932, p. 271]). While the *NYSE* did not impose audit requirements until 1934 (see Schultz [1936, p. 22]), over 90% of *NYSE* firms had obtained voluntary audits during the period covered by our study (see May [1926, p. 322]). While one purpose of auditing is to enhance the credibility of financial statements, there is reason to believe that 1920s audits were less than completely effective in eliminating misrepresentation in financial statements provided to shareholders. Audits of U.S. firms began as balance sheet verifications in connection with credit decisions; the benefits of auditing may not have extended to shareholder reports since management frequently issued different reports when making public disclosures due to competitive concerns (see Hawkins [1986, pp. 217–31]). In addition, auditors were perceived to lack power in disputes with management (see Berle and Means [1932, pp. 182–83]).

Despite these potential problems, some early twentieth-century accountants held the view that audits enhanced financial statement credibility by curbing managerial optimism in financial reporting (see Montgomery [1913] and Moss [1914]). Some early auditing texts suggest that intangibles (like any asset) should be subject to auditor scrutiny, and recommend procedures to verify and measure intangibles (see Montgomery [1919, pp. 120–28]). However, other texts also note that intangible asset

valuations were subject to considerable uncertainty, and that auditors bore lower costs for misstated intangible assets since intangibles were typically ignored in credit decisions (see Bell and Powelson [1924, p. 241]).

Another potential constraint on managerial reporting choices for intangibles is the existence of sophisticated intermediaries capable of analyzing financial reports and detecting departures from established reporting norms. In modern capital markets, security analysts and others (e.g., bond rating agencies, lenders, etc.) evaluate a firm's financial reports with the intent of assessing (among other things) earnings quality. Similarly, a "two-tiered" capital market existed in the 1920s where sophisticated intermediaries analyzed accounting numbers.

The emergence of security analysis and, hence, sophisticated intermediaries in the pre-*SEC* era is related to both increased ownership of corporate securities by the general public and wider availability of data for financial analysis (see Sobel [1965, pp. 131–32 and 175–79]). These intermediaries included analysts with brokerage firms, large institutional investors, and rating agencies which analyzed both bonds and stocks (see Carosso [1970, pp. 271–99] and Twentieth Century Fund [1934, pp. 137–52]). These arrangements were rudimentary by modern standards, with the widespread presence of security analysts in the capital markets accelerating after World War II. For instance, Sobel [1965, p. 340] notes that the New York Society of Security Analysts was formed in the 1930s with 20 charter members, but by 1962 its membership was approximately 2,700. However, despite their fewer number, sophisticated information intermediaries were believed to be the primary long-run influence on stock price in the 1920s (see Ripley [1927, p. 169]).

2.3 PRIMARY HYPOTHESIS

Our primary tests concern the relation between intangible assets and stock prices for *NYSE* industrial firms in the 1920s. For a sample of *NYSE* industrial firms reporting material carrying amounts for intangible assets on their 1927 balance sheets, we examine two types of possible relations between intangibles and stock prices.

We first decompose firms' book values into tangible and intangible components and test whether, despite potential reliability problems with capitalized intangibles, investors price these assets positively. In these tests, we regress stock price against capitalized intangibles, earnings, and tangible book value (tangible assets less all liabilities, reserves, and preferred stock). If capitalized intangibles are perceived by investors as legitimate assets, their coefficient in this model will be significantly greater than zero.

Second, we test for an interaction between reported earnings and capitalized intangibles. If firms defer costs which should be expensed as a means to overstate current earnings, these effects would not reverse in later years unless the firm also amortized intangibles. Since many firms did not amortize intangible assets, investors may discount firms' earnings

because of cost deferrals which would not be amortized against future income.[10] These effects should be increasing in the magnitude of deferred costs, so we test whether the coefficient on an interaction between earnings and intangibles is negative.

3. *Sample Selection and Data*

To reduce data collection costs, our tests are based on data from the year 1927. We chose this year for several reasons. First, because monthly stock price data for *NYSE* firms are available from *CRSP* dating back to December 1925, we restricted our focus to the years between 1926 and 1933. Second, we eliminated 1929–33 because low share price levels after October 1929 could work against finding significant valuation effects for intangibles (i.e., market-to-book ratios fell after the market crash in October 1929). Third, we eliminated 1928 due to large stock price increases in the year preceding the stock market crash of October 1929 (see Sobel [1988, p. 354]). This left only 1926 or 1927; we chose the latter since we had already collected 1927 financial statement data for some *NYSE* industrials.

We first identified firms on the *CRSP Monthly File* listed on the *NYSE* at any point during calendar 1927. From these 608 firms, we eliminated 157 firms in the transportation, electric and gas utilities, financial services, and insurance industries since these firms' reporting practices would be influenced by regulatory processes. We eliminated 31 companies whose financial statement data in *Moody's Industrial Manuals* were unavailable, not usable (e.g., due to fiscal year change), or insufficient due to missing financial statement items. Finally, we eliminated 15 firms where a common stock price was not available on *CRSP* at the end of the third month following the firm's fiscal year-end. The application of these filters left 405 firms with sufficient data.

We initially classified firms by intangibles reporting policy as shown in panel A of table 1. Material Disclosure (*MD*) firms (146 firms or 36.0% of the sample) report all intangibles as one or more separate line items with material carrying values; these firms comprise our primary sample. Nominal Discloser (*ND*) firms (56 firms, 13.8% of the sample) report intangibles at carrying values of less than $100. Ambiguous Discloser (*AD*) firms (193 firms or 47.7% of the sample) either show no intangibles on their balance sheet or explicitly aggregate reported intangibles with other assets. The remaining 10 firms have mixed policies.

Panel B provides evidence suggesting that capitalized intangibles are a material component of *MD* firms' balance sheets. At the mean (median), intangible assets constitute 19.2% (14.7%) of total assets, and book values would be materially reduced by excluding intangibles—e.g., the mean (median) ratio of tangible book value to book value equals .68 (.74).

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[10] Graham and Dodd [1934, pp. 420–28 and 527–29] describe the practice of insufficient (or nonexistent) amortization and the nature of adjustments needed to correct reported earnings for direct write-offs to surplus.

TABLE 1

Characteristics of Intangible Asset Reporting Policies for NYSE Industrial Corporations Pertaining to Annual Reports with Fiscal Year-Ends during Calendar 1927

Panel A: Classification of Firms by Type of Reporting Policy[1]

Category	Number of Firms
Material Discloser (*MD*) Firms	146 (36.0%)
Nominal Discloser (*ND*) Firms	56 (13.8%)
Ambiguous Discloser (*AD*) Firms	193 (47.7%)
Mixed Policies	10 (2.5%)
TOTAL	405 (100%)

Panel B: Magnitude of Capitalized Intangibles for *MD* Firms[2]

	Mean	Median	Interquartile Range
Percentage of Total Assets	19.2%	14.7%	4.9% to 27.1%
Tangible *BV/BV*	.668	.740	.562 to .934

Panel C: Types of Intangible Assets for *MD* Firms

			Sign of Change in Asset from 1926[3]			
Asset Type[4]	Number of Assets	Mean (Median) % of Assets[2]	# (%) Positive Change	# (%) No Change	# (%) Negative Change	Total
Goodwill	46	19.6% (12.3%)	4 (9.1%)	30 (68.2%)	10 (22.7%)	44
Rights (Patents, Trademarks, etc.)	48	15.0% (5.4%)	16 (34.8%)	13 (28.3%)	17 (37.0%)	46
Other Intangibles[5] (Organization Costs, Brands, Advertising)	4					
Combined Goodwill with Rights or Other Intangibles	55	20.9% (19.8%)	19 (35.8%)	21 (39.6%)	13 (24.5%)	53
TOTAL	153		39 (27.5%)	63 (44.4%)	40 (28.2%)	142

[1]*MD* (Material Discloser) firms are ones which show separate intangibles on their balance sheet at material amounts and *ND* (Nominal Discloser) firms are those showing separate intangibles at nominal amounts. *AD* (Ambiguous Discloser) firms are ones showing no separate intangibles, while mixed policies refer to firms whose reporting policies cannot readily be categorized as *MD*, *ND*, or *AD* firms.

[2]Percentage of total assets equals the amount of capitalized intangibles divided by total assets per the firm's 1927 balance sheet. Tangible *BV/BV* equals book value (i.e., total assets less liabilities, preferred stock, and reserves) less intangibles, all divided by book value.

[3]These columns show the change in the reported asset balance between 1926 and 1927. The total number of assets where the change could be calculated is less than the total number of assets shown on 1927 balance sheets since some firms did not report these assets consistently across the two years.

[4]Goodwill includes only assets of this type. Rights include legal rights such as patents, trademarks, leaseholds, licenses, and water rights. Other intangibles includes items such as organization costs, brands, and advertising which carry no legally defined rights and are not labeled as goodwill. Combined intangibles are cases where goodwill has been aggregated with rights or other intangibles for purposes of balance sheet presentation.

[5]Summary statistics are not reported for the other intangibles category due to the small sample size.

Further, the sample exhibits considerable cross-sectional variation in the magnitude of capitalized intangibles. The 25th (75th) percentile for intangibles as a percentage of total assets equals 4.9% (27.1%). Such variation enhances the power of our subsequent tests for a relation between intangibles' carrying values and stock prices.

Panel C describes the types of intangible assets shown on *MD* firms' balance sheets. (The total number of assets equals 153 since 7 of the 146 *MD* firms report two separate intangibles with material carrying values.) For each category except other intangibles, panel C also shows the mean and median percentage of total assets and the sign of the change in the asset's valuation from 1926 to 1927. The number of asset change values is less than the number of assets, because some firms did not report intangible assets consistently in their 1926 and 1927 balance sheets.

The evidence in panel C is consistent with observations by contemporary accountants that goodwill was the most frequently reported and largest intangible reported by early twentieth-century firms (see Sanders, Hatfield, and Moore [1938, p. 67]). In 46 cases, goodwill is shown as a distinct line item and in another 55 cases, it is aggregated with additional intangibles. In 48 cases, rights (e.g., patents, trademarks, etc.) of one form or another are reported as a separate line item.[11] Other intangibles not labeled as goodwill and lacking a legal right (e.g., organization costs, brands, and advertising) are relatively infrequent (only 4 cases). It is possible that these assets have been capitalized but labeled as goodwill (e.g., Yang [1927, pp. 157–59] and Sanders, Hatfield, and Moore [1938, pp. 67–68]). The mean (median) percentage of total assets is 19.6% (12.3%) for goodwill and 15.0% (5.4%) for rights. Not surprisingly, these figures are even higher for the cases where goodwill is combined with additional intangible assets.[12]

Finally, the change in asset value is an indicator of whether intangibles are being amortized or revalued; assets exhibiting zero change between 1926 and 1927 are not likely subject to amortization or revaluation. For the 142 assets where this change can be computed, 63 (44.4%) show no change between 1926 and 1927. This frequency is higher for goodwill than for rights-based intangibles (68.2% vs. 28.3%). Thus, many of the intangible assets reported by *MD* firms were not likely subject to regular amortization or revaluation, and this frequency is likely higher for goodwill. This evidence is also consistent with observations by early twentieth-century accountants (see Hatfield [1917, p. 115] and Sanders, Hatfield, and Moore [1938, pp. 65–69]).

The decision to report separate material carrying amounts for intangibles is an endogenous choice by *MD* firms' managers. Consequently, interpreting our subsequent tests requires an understanding of how *MD* firms differ from *ND* and *AD* firms. Table 2 reports evidence on differences between the samples in terms of industry composition, size, market

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[11] These 48 cases represent the following types of assets: patents ($n = 9$), leaseholds ($n = 12$), trademarks ($n = 8$), licenses, land and water rights ($n = 5$), and multiple aggregated rights-based intangibles ($n = 14$).

[12] Using a Wilcoxon test, the median amount for rights-based intangibles is significantly less than the median for goodwill at the .10 level and the median for combined rights–goodwill at the .01 level. The difference in medians between the goodwill only and combined rights–goodwill categories is not significant at the .10 level.

TABLE 2

Firms-Specific Characteristics of NYSE Industrial Corporations during 1927 for Samples Defined by Intangible Asset Reporting Policies[1]

	MD Firms[1]	*ND* Firms[1]	*AD* Firms[1]
Panel A: Industry Composition[2]			
SIC 01–16	4 (2.7%)	0 (0.0%)	30 (15.5%)
SIC 20–29	54 (37.0%)	24 (42.8%)	73 (37.8%)
SIC 30–39	64 (43.8%)	23 (41.1%)	82 (42.5%)
SIC 50–59	24 (16.5%)	9 (16.1%)	8 (4.2%)
Total Number of Firms	146	56	193
Panel B: Size[2]			
Median Market Value of Equity (*MVE*)	$14.1 million	$19.7 million	$18.8 million
Panel C: Market Capitalization Ratios[2]			
Median Market-to-Tangible Book Value	1.63	1.60	0.99***
Median Market-to-Book Value	1.09	1.60***	0.99*
Median Price–Earnings Ratio	11.99	11.45	11.05
Panel D: Profitability Measures[2]			
Median Return on Tangible Book Value	13.0%	15.0%	6.6%***
Median Return on Book Value	10.0%	15.0%***	6.6%***
Median One-Period Percentage Earnings Growth	2.0%	9.2%*	–20.0%***
Median One-Period Percentage Sales Growth	0.2%	1.3%	–4.5%*
Percentage of Firms Disclosing Annual Sales	54.8%	55.4%	52.3%
Panel E: Asset Write-Off Constraints[2]			
Median Intangibles/Surplus	.47	NA	NA
Median Long-Term Tangible Assets/Surplus	1.55	1.00*	1.78
Median Long-Term Assets/Surplus	2.44	1.00***	1.78**
Median Dividend Payout Rate	.44	.50	.54
Median Dividend Yield	.042	.054	.071
Percentage of Firms Paying Dividends	67.7%	75.0%	67.4%
Panel F: Risk Measures[2]			
Median Long-Term Debt/*MVE*	.042	0.0**	.013
Median (Long-Term Debt + Preferred Stock)/*MVE*	.171	.206	.340*
Median Beta	.947	.837	.930
Moody's Common Stock Ratings:			
Investment (Aaa, Aa, and A)	9 (6.2%)	6 (10.7%)	12(7.8%)
Mixed Investment–Speculative (Baa, Ba, and B)	72 (49.6%)	38 (67.9%)	91 (47.9%)
Speculative (Caa, Ca, and C)	64 (44.2%)	12 (21.4%)	84 (44.3%)
Number of Firms Not Rated	1	0	3

[1]*MD* firms are those reporting material amounts of capitalized intangible assets on their 1927 balance sheet. *ND* firms report intangible assets with nominal valuations less than $100. *AD* firms report no separate intangibles on their balance sheet.

[2]Industry membership is based on *SIC* codes reported by *CRSP.* Market value of equity equals the number of common shares times share price three months after year-end. All market capitalization ratios are based on stock price three months after year-end adjusted for dividends paid since the end of the fiscal year. Tangible book value equals total assets less intangibles, liabilities, reserves, and preferred stock. Book value equals total assets less liabilities, reserves, and preferred stock. Return on tangible book value (book value) equals net income less preferred dividends divided by tangible book value (book value). One-period growth measures are calculated by differencing the reported values for earnings and sales in 1927 and 1926 and then dividing by 1926 numbers. Surplus represents the portion of owners' equity not linked to preferred shares or the par value of common stock. The dividend payout rate is the common dividends paid in 1927 divided by income available to common shareholders in 1927. Dividend yield equals the amounts of dividends paid per share divided by the beginning-of-year share price. Long-term debt/*MVE* equals the book value of long-term debt divided by the market value of equity. Long-term debt + preferred stock/*MVE* equals the book value of long-term debt and preferred stock combined divided by the market value of equity. Betas are estimated using monthly rates of return over the 36 months from January 1926 to December 1928. *Moody*'s common stock ratings are obtained from the same annual *Industrial Manual* used to obtain financial statement data.

*Significantly different from median for *MD* firms at .10 level for two-tailed Wilcoxon test.

**Significantly different from median for *MD* firms at .05 level for two-tailed Wilcoxon test.

***Significantly different from median for *MD* firms at .01 level for two-tailed Wilcoxon test.

capitalization ratios, profitability measures, asset write-off constraints, and risk measures.

We examine industry composition and size since reporting choices often vary with these characteristics. Market capitalization measures provide evidence on cross-sample differences in the relation between stock price and summary balance sheet measures. We examine profitability and asset write-off constraints since *MD* firms may report intangibles, in part, because they are unable to eliminate these assets through write-offs against income or surplus. Dividend-related variables are categorized as write-off constraints since the early impetus for capitalizing goodwill was to avoid impairing dividend-paying ability. Risk measures are reported since earnings capitalization coefficients may decline as risk increases.

Compared to *ND* firms, *MD* companies have similar industry composition (based on single-digit *SIC* codes) and firm size measured as the market value of equity.[13] The *MD* firms have lower median market-to-book and return on common equity ratios (at the .01 level), but these differences are largely due to including intangibles in the asset base. Excluding intangibles, these measures do not differ significantly at the .10 level across the two groups. The median ratio of market-to-tangible book value is 1.63 for the *MD* firms and 1.60 for the *ND* companies, implying that both sets of firms are perceived to possess unreported tangible assets and/or intangible assets.[14] The drop to a market-to-book ratio of 1.09 for *MD* firms implies that investors price these firms at a premium over tangible book value that slightly exceeds carrying values for intangibles.

The *MD* and *ND* samples differ in earnings growth and asset write-off constraints measured by the level of long-term assets to surplus. Median one-period percentage earnings growth is lower (at the .10 level) for *MD* firms than for *ND* companies (2.0% versus 9.2%), and the median *MD* firm would eliminate 47% of its surplus if all intangibles were written off. Further, *MD* firms carry significantly higher amounts of total long-term assets (at the .01 level) than do *ND* companies, and this difference is not entirely attributable to intangibles—i.e., *MD* firms' long-term tangible assets are also significantly higher (at the .10 level) than those of *ND* companies. Thus, *MD* firms may be more constrained in their ability to write off intangibles. However, these constraints are not associated with significantly lower dividend-paying frequencies, dividend yields, or payout rates for *MD* firms.

In terms of risk measures, *MD* firms have higher leverage based on the ratio of long-term debt to equity (at the .05 level), but the samples

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[13] The industry composition of the *MD* sample is similar to *NYSE* firms in the 1990s for *SIC* codes 30–39 and 50–59. However, only 3% of the *MD* firms operate in 01–16 code industries, compared to 16% of *NYSE* firms at the end of calendar 1997. Thirty-seven percent of the *MD* sample is from *SIC* code 20–29 industries, compared to 29% of *NYSE* firms at 12/31/97.

[14] These numbers are lower than those of firms in the 1990s. For instance, the median market-to-tangible book ratio is 2.36 (2.26) for all *NYSE* (*NYSE, AMEX,* and *NASDAQ*) firms at 12/31/97.

do not differ when preferred stock is included in the leverage ratio.[15] *MD* firms also have weaker *Moody's* common stock ratings than *ND* firms. For instance, 44.2% of the *MD* firms are characterized by *Moody's* as speculative, compared to 21.4% of *ND* firms.

Relative to *AD* firms, the *MD* companies are more profitable, have higher earnings and sales growth, and are priced at higher multiples of book value and tangible book value. The industry composition of the samples also differs. The *MD* sample contains fewer firms in *SIC* codes 01–19 (agriculture and natural resource extraction) and more firms in *SIC* codes 50–59 (retailers). The proportion of *MD* and *AD* firms in manufacturing and processing industries (*SIC* codes 20–29 and 30–39) is roughly comparable. These comparisons are more difficult to interpret since differences between *MD* and *AD* firms could reflect effects of factors either associated with the intangibles capitalization decision or the decision to separately report capitalized intangibles.[16]

The primary implication of the cross-sample differences reported in table 2 is that the decision by *MD* firms to capitalize and separately report intangible assets is correlated with other variables such as profitability and risk. For purposes of our primary tests, these results raise a concern about correlated omitted variables. We investigate the robustness of our primary results to these effects in section 4.2.

4. *Empirical Evidence*

4.1 RESULTS OF PRIMARY TESTS

The relation between stock price and intangibles is assessed for *MD* firms using three pooled cross-sectional regression models:

$$P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 BV_i + e_i. \quad (1a)$$

$$P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 TBV_i + \gamma_3 INTAN_i + e_i. \quad (1b)$$

$$P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 TBV_i + \gamma_3 INTAN_i + \gamma_4 INTER_i + e_i. \quad (1c)$$

Equation (1*a*) includes earnings (*EARN*) and book value (*BV*) as explanatory variables (both on a per share basis). Cum-dividend stock price (*P*) at the end of the third month following the firm's fiscal year-end is the dependent variable.[17] Equation (1*b*) decomposes book value into

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[15] The median leverage ratio increases substantially when preferred stock is included because industrials issued limited amounts of long-term debt. Because these firms were seen as too risky to issue debt, they frequently substituted preferred stock as a financing vehicle (see Dewing [1922, vol. 1, pp. 121–22]).

[16] *AD* firms may either have not capitalized intangibles or aggregated intangibles with other assets. For 12 of the 193 *AD* firms, intangibles are reported as part of an aggregate which also contains tangible assets. Because *AD* firms provide no separate disclosure of intangible assets, all ratios for *AD* firms shown in table 2 are based on "as reported" financial statement numbers.

[17] We replicated our primary tests using both prices at months +4 and +6 to compute the dependent variable; inferences based on these later prices are identical to those based on month +3 prices.

TABLE 3

Results of Regression Tests Examining the Value Relevance of Intangible Assets for 146 Material Discloser (MD) Firms among NYSE Industrial Corporations during 1927

Models:

$$P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 BV_i + e_i^1 \quad (1a)$$

$$P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 TBV_i + \gamma_3 INTAN_i + e_i^1 \quad (1b)$$

$$P_i + \gamma_0 + \gamma_1 EARN_i + \gamma_2 TBV_i + \gamma_3 INTAN_i + \gamma_4 INTER_i + e_i^1 \quad (1c)$$

	Coefficient Estimates (t-Statistics)[2]		
	Equation (1*a*)	Equation (1*b*)	Equation (1*c*)
Earnings (*EARN*)	6.95	6.99	8.65
	(8.34)	(9.13)	(9.81)
Book Value (*BV*)	.10		
	(1.01)		
Tangible Book Value (*TBV*)		2.54	.24
		(2.59)	(2.34)
Intangible Assets (*INTAN*)		−.28	.15
		(−1.82)	(1.12)
Earnings–Intangibles Interaction (*INTER*)			−0.65
			(−4.06)
Adjusted R^2	.62	.65	.67

[1]The models are estimated using stock price and financial statement data for *NYSE* industrial corporations reporting material and separate intangible assets in their 1927 balance sheets. *P* equals the cum-dividend stock price for the third month following the firm's fiscal year-end, *EARN* equals the annual earnings less preferred dividends, *BV* equals book value, *TBV* is the tangible book value, *INTAN* equals the amount of capitalized intangibles, and *INTER* is the product of *EARN* and *INTAN*. All variables are expressed on a per share basis based on the number of common shares outstanding at the end of the third month following the firm's fiscal year-end. Price data are taken from the *CRSP Monthly File* and financial statement data are from the 1927 or 1928 *Moody's Industrial Manuals*. Three extreme observations have been deleted, resulting in a sample of 143 observations used in the tests.

[2]*T*-statistics are based on standard errors corrected for heteroscedasticity, as described in White [1980].

tangible book value (*TBV*) and intangible assets (*INTAN*). In (1*b*) the coefficient on *INTAN* captures the net effect of capitalized intangibles on stock price. Equation (1*c*) includes an additional interaction variable (*INTER*) equal to the product of *EARN* and *INTAN*. If investors discount earnings as an increasing function of the level of capitalized intangibles, we expect the coefficient on *INTER* will be negative. Results based on *OLS* estimation are shown in table 3. *T*-statistics are based on the White [1980] correction for heteroscedasticity, and three observations with studentized residuals exceeding 3.0 are deleted as described in Belsley, Kuh, and Welsch [1980].

The results in table 3 provide no evidence of a significant positive relation between capitalized intangibles and share price. The coefficient on *INTAN* is negative and significant ($\alpha \leq .10$, two-tailed t-test) in (1*b*) but is not significant at the .10 level in (1*c*). In addition, the coefficient on *INTER* is negative and significant at the .001 level. This evidence sup-

ports the hypothesis that the coefficient mapping earnings into share price decreases as the level of capitalized intangibles increases.[18]

Further, the pricing of book value hinges on the disaggregation of intangible assets. The coefficient on total book value in (1*a*) is not significantly different from zero at the .10 level, but the coefficient on tangible book value in (1*b*) and (1*c*) is significantly positive at the .05 level in both cases. Finally, capitalized intangibles may bear little relation to stock prices if investors attach economic value to intangibles only when they yield higher earnings—that is, investors may capitalize these assets into price when payoffs are realized rather than when investments are made (see Graham and Meredith [1937, p. 23]). Consistent with this hypothesis, the coefficient mapping *MD* firms' earnings into share prices is positive and significant at the .001 level.[19]

4.2 RESULTS OF ADDITIONAL TESTS

The results in table 3 raise two general issues. The first is whether intangibles are significantly related to price for firms in our sample where investors may perceive that the reliability of intangibles' carrying values is greater. A second issue is interpretation of the significant negative coefficient on *INTER*. Namely, does it capture the effect of a correlated omitted variable, and does it imply that *MD* firms' stock prices are lower due to separate reporting for intangible assets in their balance sheet?[20]

4.2.1. The Reliability of Intangible Asset Carrying Values. We first examine the relation between external auditing and the pricing of intangibles since the use of an external auditor and the auditor's identity may

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[18] As a check on these results, we also estimated (1*c*) specifying *INTER* as the product of *EARN* and the ratio of intangibles to surplus. Scaling by surplus assumes investors assess the magnitude of intangibles using a benchmark based on cumulative prior earnings and provides an indicator of the degree to which prior earnings are higher due to cost deferrals. Inferences based on this specification of *INTER* are identical to those based on the results reported in table 3.

[19] Barth and Kallapur [1996] suggest that "levels" regressions like (1*a*)–(1*c*) may be subject to scale effects which result in biased coefficient estimates. We re-estimated our models using market value of equity as the dependent variable with the number of common shares included as an additional variable to proxy for scale effects. The inferences about the relation between price and intangibles from this analysis are identical to those based on results reported in table 3. Likewise, our inferences about the relation between price and capitalized intangibles are unchanged by scaling the variables by beginning-of-year price as suggested by Brown, Lo, and Lys [1998]. Finally, Easton [1998] suggests that deflating by the number of common shares may induce a spurious correlation. Our results do not appear to be driven by an induced correlation since (1) the correlation between price and the inverse of the number of common shares is insignificantly different from zero for our sample and (2) the inclusion of an interaction between *EARN* and the inverse of common shares does not affect the significant negative coefficient on *INTER*.

[20] All regression tests reported in section 4.2 are based on *OLS* estimation where extreme observations with studentized residuals of 3.0 or more in (1*c*) have been deleted. Inferences in all cases are based on two-tailed *t*-tests where standard errors have been corrected for heteroscedasticity, as described in White [1980].

influence investor perceptions about the reliability of intangible asset carrying values. For example, investors may attach little weight to intangibles reported in unaudited financial statements but give considerable weight to similar assets reported in financial statements attested to by an auditor with a reputation for high-quality audit work. Prior research argues that perceived audit quality is increasing in auditor size (see DeAngelo [1981] and Yardley et al. [1992]). Hence, we investigate whether the relation between intangible assets and stock price is significantly positive when the firm provides audited financial statements attested to by a large auditor.

Merino, Mayper, and Sriram [1994] identify nine auditing firms having the largest market share (defined by number of clients) for companies traded in New York capital markets in 1927.[21] Data on auditor identity for our sample firms (from *Moody's Industrial Manual*) indicate that *MD* firms obtained audits more frequently than other companies. Only 17% of the *MD* firms provided unaudited financial statements, compared to 21% of *ND* firms and 26% of *AD* companies. Over 60% of *MD* firms were audited by one of the top nine auditors identified by Merino, Mayper, and Sriram [1994]. The largest auditor, Price Waterhouse, audited 16% of *MD* firms, 32% of *ND* firms, and 15% of *AD* firms.

To assess the impact of auditing on our primary results, we adapted (1*c*) to allow the coefficients on *INTAN* and *INTER* to vary with the identity of the firm's auditor.

$$P_i = \alpha_0 + \alpha_1 EARN_i + \alpha_2 TBV_i + \alpha_3 INTAN_i + \alpha_4 INTER_i + \alpha_5 INTAN_i DAUD_i + \alpha_6 INTER_i\, DAUD_i + e_i \qquad (2)$$

where *DAUD* is a 0–1 indicator variable measuring the identity of a firm's external auditor. We use three alternative specifications of *DAUD*. The first sets *DAUD* equal to one for firms providing audited financial statements, the second sets *DAUD* equal to one if the firm employs one of the nine largest auditors identified by Merino, Mayper, and Sriram [1994], and the third sets *DAUD* equal to one for firms audited by the largest auditor of the era, Price Waterhouse.

Our primary interest is whether capitalized intangibles are positively priced when the firm provides audited financial statements or is audited by a large auditor. If so, the coefficient on the interaction between *INTAN* and *DAUD* will be positive. In addition, if the earnings of firms with audited financial statements or those employing large auditors are subject to a smaller discount to earnings associated with reported intangibles, the coefficient on the interaction between *INTER* and *DAUD* will be positive.

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[21] These auditing firms are (in descending order): Price Waterhouse; Ernst and Ernst; Haskins and Sells; Arthur Young; Peat, Marwick, and Mitchell; Lybrand, Ross Brothers, and Montgomery; Barrow, Wade, and Guthrie; Delloite, Plenders, and Griffin; and Touche Niven. These data are taken from n. 28 in Merino, Mayper, and Sriram [1994, p. 638].

Estimation results for (2) (not reported in a table) indicate that the coefficient on the interaction between intangibles and auditor identity is not significantly different from zero at the .10 level for all specifications of *DAUD*. This suggests that intangibles do not map positively into price even when the firm supplies audited financial statements or employs a large auditor. We did find evidence that clients of Price Waterhouse had more positive coefficients applied to their earnings in equity pricing. When *DAUD* equals one for Price Waterhouse clients, the coefficient on the product of *DAUD* and *INTER* is positive and significant at the .05 level for a two-tailed test.

INTAN may also bear no relation to price for the full sample because only a subset of assets are perceived by investors as subject to reliable measurement. For instance, rights-based intangibles may be perceived as more reliable since they were more likely subject to amortization and/or revaluation, and also because goodwill was seen as especially problematic. If this argument is valid, the coefficient on *INTAN* will most likely be positive for firms reporting only rights-based intangibles without any goodwill. To assess whether our primary results are sensitive to type of intangible asset, we estimate (1*c*) for four (overlapping) subsamples: (1) firms showing only rights-based intangibles without goodwill, (2) all firms showing rights-based intangibles (even those with goodwill), (3) firms showing only goodwill, and (4) all firms showing goodwill (including firms also reporting rights-based intangibles).

The results in table 4 indicate that the coefficient mapping intangibles into price is positive and significant at the .001 level for firms showing only rights-based intangibles on their balance sheet. This is consistent with positive pricing of rights-based intangibles, but caution should be used in interpreting this result for two reasons. First, the earnings–intangibles interaction remains negative and significant at the .001 level for these firms. Second, the coefficient on *INTAN* is also positive and significant at the .05 level for firms reporting only goodwill without rights-based intangibles. Thus, the economic interpretation of intangibles' pricing for firms reporting only rights-based intangibles is ambiguous.[22]

As a more direct test of whether the extent of amortization and/or revaluation influences investor perceptions of the reliability of intangibles' carrying values, we partitioned the *MD* firms into three groups by direction of change in carrying values from 1926 to 1927 and reestimated (1*c*) for each group. If the results for rights-based intangibles are the artifact of regular amortization and/or revaluation, then the positive pricing of intangibles will be strongest (weakest) for firms reporting declines (no change) in intangible asset carrying values. The results of these tests (reported in table 5) are consistent with this conjecture. Intangibles are

[22] Consistent with this conclusion, the coefficient on *INTAN* for firms reporting only rights-based intangibles in (1*b*) is not significantly different from zero at the .10 level.

TABLE 4

Tests of the Pricing of Intangible Assets by Asset Type for 146 Material Discloser (MD) Firms among NYSE Industrial Corporations during 1927

Model: $P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 TBV_i + \gamma_3 INTAN_i + \gamma_4 INTER_i + e_i$[1]

	Coefficient Estimates (t-Statistics)[2]			
	MD Firms with ONLY Rights-Based Intangibles ($N = 40$)[3]	*MD* Firms with ANY Rights-Based Intangibles ($N = 99$)[4]	*MD* Firms with ONLY Goodwill ($N = 41$)[5]	*MD* Firms with ANY Goodwill ($N = 99$)[6]
EARN	10.09	5.25	10.56	7.95
	(9.94)	(2.44)	(6.64)	(7.64)
TBV	.30	.46	.60	.28
	(2.05)	(1.91)	(4.17)	(1.98)
INTAN	1.58	.19	.79	−.13
	(3.87)	(0.84)	(2.04)	(−0.66)
INTER	−.28	−.02	−.22	−.01
	(−7.37)	(−2.67)	(−3.06)	(−1.54)
Adjusted R^2	.812	.457	.694	.559

[1]The model is estimated using stock price and financial statement data for *NYSE* industrial corporations reporting material and separate intangible assets in their 1927 balance sheets. *P* equals the cum-dividend stock price for the third month following the firm's fiscal year-end, *EARN* equals the annual earnings, *TBV* is the tangible book value, *INTAN* equals the amount of capitalized intangibles, and *INTER* is the product of *EARN* and *INTAN*. All variables are expressed on a per share basis based on the number of common shares outstanding at the end of the third month following the firm's fiscal year-end. Price data are taken from the *CRSP Monthly File* and financial statement data are from the 1927 or 1928 *Moody's Industrial Manuals*.

[2]*T*-statistics are based on standard errors corrected for heteroscedasticity, as described in White [1980].

[3]This subsample includes firms showing only rights-based intangibles with no additional intangible assets on their 1927 balance sheet.

[4]This subsample includes firms showing any kind of rights-based intangibles on their 1927 balance sheet.

[5]This subsample includes firms showing only goodwill with no additional intangible assets on their 1927 balance sheet.

[6]This subsample includes firms showing any goodwill on their 1927 balance sheet.

positively priced for firms reporting declines in asset carrying values (coefficient on *INTAN* equals .787, significant at the .01 level). No significant relation between *INTAN* and stock price is evident for firms showing no change or increases in carrying values. Like the results in table 4, the net effect of intangibles on price for negative change firms is ambiguous since the coefficient on *INTER* remains negative and significant at the .01 level.

In sum, the results reported in this subsection suggest that intangibles are positively related to stock price for rights-based intangibles and/or those subject to periodic amortization or downward revaluations. However, the overall pricing effect of intangibles for these firms is ambiguous since the earnings–intangibles interaction remains negative and signifi-

TABLE 5

Tests of the Pricing of Intangible Assets According to Sign of Change in Intangible Asset Carrying Values for 146 Material Discloser (MD) Firms among NYSE Industrial Corporations during 1927

Model: $P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 TBV_i + \gamma_3 INTAN_i + \gamma_4 INTER_i + e_i$[1]

	Coefficient Estimates (t-Statistics)[2]		
	Asset Change < 0[3]	Asset Change = 0[4]	Asset Change > 0[5]
EARN	11.11	9.22	10.56
	(7.54)	(9.86)	(5.75)
TBV	.10	.29	.27
	(1.22)	(1.87)	(1.46)
INTAN	.78	−.11	−.03
	(2.61)	(−0.31)	(−0.23)
INTER	−.13	−.08	−.15
	(−2.93)	(−3.82)	(−3.36)
Adjusted R^2	.566	.792	.726

[1]The model is estimated using stock price and financial statement data for *NYSE* industrial corporations reporting material and separate intangible assets in their 1927 balance sheets. *P* equals the cum-dividend stock price for the third month following the firm's fiscal year-end, *EARN* equals the annual earnings, *TBV* is the tangible book value, *INTAN* equals the amount of capitalized intangibles, and *INTER* is the product of *EARN* and *INTAN*. All variables are expressed on a per share basis based on the number of common shares outstanding at the end of the third month following the firm's fiscal year-end. Price data are taken from the *CRSP Monthly File* and financial statement data are from the 1927 or 1928 *Moody's Industrial Manuals*.

[2]*T*-statistics are based on standard errors corrected for heteroscedasticity, as described in White [1980].

[3]This subsample includes firms showing decreases in the carrying values of intangibles from 1926 to 1927.

[4]This subsample includes firms showing no change in the carrying values of intangibles from 1926 to 1927.

[5]This subsample includes firms showing increases in the carrying values of intangibles from 1926 to 1927.

cant. We find no relation between the disclosure of audited financial statements (or external auditor identity) and the coefficient mapping *INTAN* into stock price. However, firms audited by Price Waterhouse do exhibit a significantly lower discount applied to their earnings as a result of capitalized intangibles.

4.2.2. Interpretation of the Significant Negative Earnings–Intangibles Interaction. Two questions arise concerning interpretation of the significant negative coefficient on *INTER* in table 3. First, does this effect reflect a correlated omitted variable? Second, does the negative interaction imply that *MD* firms are penalized with lower stock prices by separately reporting intangible assets on their balance sheet?

We conducted several tests to ascertain whether the significant negative coefficient on *INTER* reflects a correlated omitted variable related to either risk or earnings quality. If riskier firms have lower earnings coefficients, and they also capitalize greater amounts of intangibles, then the significant negative coefficient on *INTER* may result from omission of

an interaction between earnings and a measure for risk. Similarly, intangibles may proxy for broader earnings management incentives that may not be unique to cost deferrals associated with intangibles. In either case, adding variables to (1*c*) to capture the impact of these factors on the earnings–price relation would cause the coefficient on *INTER* to become insignificant.

We estimated a cross-sectional model identical to (1*c*) except that we added a second interactive term (*EARNRISK*) measured as the product of *Moody's* common stock ratings (or a leverage ratio) and earnings. The former case was specified as a 0–1 variable where firms receiving speculative *Moody's* common stock ratings (grade Caa or lower) assumed a value of one. In the second specification, *EARNRISK* was based on the firm's leverage ratio measured by the book value of long-term debt and preferred stock divided by the market value of common equity. If risk is a correlated omitted variable driving the significant negative earnings–intangibles interaction, the coefficient on *INTER* will become insignificant when *EARNRISK* is added to the model.

Results of these tests (not reported in a table) indicate a significant negative coefficient on *EARNRISK* (at $\alpha \leq .001$, two-tailed test) in both cases. However, even with *EARNRISK* included, the coefficient on *INTER* remains negative and significantly different from zero at the .01 level using a two-tailed test. Hence, it is unlikely that the significant negative earnings–intangibles interaction in table 3 arises from an omitted risk–earnings interaction.

We used similar tests to investigate whether inclusion of proxies for managers' incentives to manipulate earnings affects the sign and significance of the coefficient on *INTER*. The proxies used in these tests include return on tangible equity (net income less preferred dividends divided by tangible book value), earnings growth (the percentage change in earnings from 1926 to 1927), and the ratio of long-term tangible assets to surplus. The first two measures, when interacted with *EARN*, should yield positive coefficients if more profitable or higher-growth firms have less incentives to manipulate earnings upward. An interaction between *EARN* and the ratio of tangible assets to surplus should result in a negative coefficient if these firms are perceived as deferring greater amounts of costs to avoid reporting lower income. The results of these tests (not reported in a table) are consistent with the tests for omitted risk proxies. The coefficient on *INTER* remains negative and significant at the .001 level in all cases even though each of these three interactive variables is significant at least at the .05 level with the predicted coefficient signs.

We also examined whether long-term tangible assets are priced in the same manner as intangibles. If cost deferrals to intangible assets are only one component of a broader policy to manipulate earnings, it is likely that *MD* firms' long-term tangible assets may also include cost deferrals which should have been expensed. To test this conjecture, we separated

TABLE 6

Results of Tests Examining the Pricing of Other Long-Term Assets Compared to Intangibles for Material Discloser (MD) Firms among NYSE Industrial Corporations during 1927

Model: $P_i = \alpha_0 + \alpha_1 EARN_i + \alpha_2 CAV_i + \alpha_3 INTAN_i + \alpha_4 INTER_i + \alpha_5 OLTA_i + \alpha_6 EOLTA_i + e_i$[1]

	Coefficient Estimates (*t*-Statistics)[2]
Earnings (*EARN*)	8.37
	(6.73)
Current Asset Value (*TBV*)	.33
	(1.94)
Intangible Assets (*INTAN*)	.20
	(1.40)
Earnings–Intangibles Interaction (*INTER*)	−.07
	(−4.20)
Other Long-Term Assets (*OLTA*)	.18
	(1.56)
Earnings–*OLTA* Interaction (*EOLTA*)	0.05
	(0.32)
Adjusted R^2	.671

[1]The model is estimated using stock price and financial statement data for *NYSE* industrial corporations reporting material and separate intangible assets in their 1927 balance sheets. *P* equals the cum-dividend stock price for the third month following the firm's fiscal year-end, *EARN* equals the annual earnings less preferred dividends, *TBV* is the tangible book value, *INTAN* equals the amount of capitalized intangibles, *INTER* is the product of *EARN* and *INTAN*, *OLTA* equals other long-term assets, and *EOLTA* is the product of *EARN* and *OLTA*. All variables are expressed on a per share basis based on the number of common shares outstanding at the end of the third month following the firm's fiscal year-end. Price data are taken from the *CRSP Monthly File* and financial statement data are from the 1927 or 1928 *Moody's Industrial Manuals*. Three extreme observations have been deleted.

[2]*T*-statistics are based on standard errors corrected for heteroscedasticity, as described in White [1980].

other long-term assets from tangible book value in (1*c*), resulting in the following model:

$$P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 CAV_i + \gamma_3 INTAN_i + \gamma_4 INTER_i + \gamma_5 OLTA_i + \gamma_6 EOLTA_i + \varepsilon_i \quad (3)$$

where *P*, *EARN*, *INTAN*, and *INTER* are as previously defined; *CAV* equals current asset value (current assets less all liabilities, reserves, and preferred stock); *OLTA* equals total long-term assets less intangibles; and *EOLTA* equals the product of *EARN* and *OLTA*. If other long-term assets are priced in the same way as intangibles, the coefficient on *EOLTA* will be significantly negative.

Results from estimating (3) are reported in table 6. In contrast to the significant negative coefficient on *INTER* ($\alpha \leq .001$, two-tailed test), the

TABLE 7

Results of Tests Examining the Capitalization of Reported Earnings for Material Discloser (MD) Firms Compared to Ambiguous Disclosure (AD) and Nominal Disclosure (ND) Firms

Model: $P_i = \gamma_0 + \gamma_1 EARN_i + \gamma_2 BV_i + e_i$[1]

	Coefficient Estimates (*t*-Statistics)[2]				
	All *MD* Firms[3]	*AD* Firms[4]	Low *INTAN* *MD* Firms[5]	High *INTAN* *MD* Firms[5]	*ND* Firms[6]
Earnings (*EARN*)	6.95	1.69	8.36	5.89	6.89
	(8.34)	(1.78)	(7.81)	(6.45)	(3.53)
Book Value (*BV*)	.01	.09	.28	.03	.02
	(1.01)	(1.43)	(2.34)	(0.27)	(0.10)
Adjusted R^2	.622	.274	.748	.552	.309

[1]The model is estimated using 1927 stock price and financial statement data for *NYSE* industrial corporations. *P* equals the cum-dividend stock price for the third month following the firm's fiscal year-end, *EARN* equals the annual earnings less preferred dividends, and *BV* equals book value. All variables are expressed on a per share basis based on the number of common shares outstanding at the end of the third month following the firm's fiscal year-end. Price data are taken from the *CRSP Monthly File* and financial statement data are from the 1927 or 1928 *Moody's Industrial Manuals.*

[2]*T*-statistics are based on standard errors corrected for heteroscedasticity, as described in White [1980].

[3]*MD* firms consist of companies reporting material amounts of intangible assets on their 1927 balance sheets. The results shown for "All *MD* Firms" were previously reported in table 3.

[4]*AD* (Ambiguous Disclosure) firms are those companies where the balance sheet provides no information about the existence and/or magnitude of capitalized intangibles.

[5]Low (high) *INTAN* firms are ones where intangibles as a percentage of total assets are less (greater) than the median of this ratio for all *MD* firms.

[6]*ND* (Nominal Disclosure) firms are companies where intangibles are separately disclosed but are reported at an aggregate carrying value of less than $100.

coefficient on *EOLTA* is not significantly different from zero at the .10 level for a two-tailed test. These results, along with tests for correlated omitted variables related to earnings quality, suggest that the significant negative earnings–intangibles interaction is not likely driven by effects associated with broader earnings management policies.

A final issue regarding the significant negative earnings–intangibles interaction is whether it implies that *MD* firms are penalized through lower share prices than if they had aggregated intangibles with other long-term assets. For instance, if they had aggregated intangibles with other long-term assets, their financial statements would be similar in form to those of firms in the *AD* sample. An *MD* firm's equity price will be lower if the overall coefficient applied to its earnings is less positive than that applied if it reported under an *AD* policy, ceteris paribus.

Table 7 provides descriptive evidence on this issue. The first two columns report coefficient estimates from (1*a*) for the full *MD* sample and the *AD* sample. To provide a richer context for evaluating these results, the next three columns show the results for: (1) *MD* subsamples defined according to the level of intangibles capitalization and (2) firms in the *ND* sample. Only *AD* and *ND* firms operating in two-digit *SIC* industries

where at least one firm reports intangibles under a *MD* policy are included in the samples for these tests.[23]

The earnings coefficient for the *AD* firms is low relative to the *MD* sample. The earnings coefficient for the *AD* firms equals 1.69 (significant at the .10 level) compared to 6.95 (significant at the .001 level) for the *MD* sample. In addition, earnings coefficients for the other samples are more positive than that of the *AD* sample, and all coefficients are significantly different from zero at the .001 level.[24] These results suggest that the negative earnings–intangibles interaction documented for *MD* firms in table 3 does not imply that *MD* firms' share prices are necessarily lower than would be the case if they had not separately disclosed intangible assets.[25]

5. *Summary*

In this paper we examined the relation between intangible assets and stock prices for *NYSE* industrial corporations in the pre-*SEC* era. Our sample allows us to assess whether carrying values for intangibles are related to stock prices in a period following major technological and economic change, when managers faced fewer regulatory restrictions on financial reporting choices. We structured tests that allow capitalized intangibles to convey information on future economic benefits and/or to condition investor evaluation of reported earnings.

Our primary sample consists of *NYSE* industrial corporations reporting material valuations for intangibles on their 1927 balance sheet. For this sample as a whole, capitalized intangibles exhibit no significant positive relation to stock price, and the coefficient mapping earnings into price is a declining function of the level of capitalized intangibles. Separate disclosure of intangibles helps preserve a relation between price and summary balance sheet measures: while book value bears no significant relation to stock price, disaggregating intangibles results in a significant coefficient mapping tangible book value into price. Finally, investors value our sample firms primarily based on earnings, perhaps because

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[23] We view these results as descriptive because they are potentially confounded by selection bias. Since the decision to disclose intangibles separately is endogenous, cross-sample comparisons between *MD* firms and *AD* or *ND* firms should be interpreted with caution.

[24] The earnings coefficient for *AD* firms is significantly lower than that of other companies. We estimated a cross-sectional model pooling firms across all three samples. This model allowed for differing coefficients for *MD* firms with low intangibles capitalization, *ND* firms, and *AD* firms relative to *MD* firms with high intangibles capitalization. The earnings coefficient for *AD* firms is significantly lower than the coefficient for high-capitalization *MD* firms at the .001 level and the earnings coefficient for low-capitalization *MD* firms is more positive at the .10 level. No other cross-sample differences in earnings and book value coefficients were significant at the .10 level.

[25] We replicated the analysis in table 7 eliminating all loss firms, with no effect on inferences.

they attach economic value to intangibles only when reflected in higher earnings rather than when investments are made.

Additional tests indicate four findings of importance for interpreting our primary results. First, we find no evidence to suggest that auditor identity affects the coefficient linking intangibles directly to price, but the negative earnings–intangibles interaction is lower for clients of Price Waterhouse. Second, intangibles are positively priced for rights-based intangibles and/or those exhibiting declines in carrying value, but the net pricing effect of intangibles remains ambiguous for these cases since the earnings–intangibles interaction is significant and negative for these firms. Third, additional tests suggest that the negative earnings–intangibles interaction is not due to a correlated omitted variable related to risk or broader earnings management incentives. Finally, the negative earnings–intangibles interaction is not associated with lower overall earnings coefficients for our sample firms compared to other firms reporting no separate intangibles on their balance sheet.

As noted at the outset, our analysis does not represent a ceteris paribus test which identifies how intangibles would be priced for modern U.S. firms under a different reporting regime than current *GAAP*. Hence, our results should not be construed to suggest that U.S. policymakers should refrain from expanding the set of conditions under which firms can capitalize the costs associated with intangibles. A more appropriate conclusion is only that an expansion in the set of intangibles recommended for capitalization may not lead to unambiguous increases in the amount of reliable information available to investors.

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[Footnotes]

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[19] **Discussion of Revalued Financial, Tangible, and Intangible Assets: Association with Share Prices and Non-Market-Based Value Estimates**

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