Evidence of Excess Market Frictions for Small Public Firms

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Abstract

As done in prior literature, we first relate the theory of liquidity and asset pricing to the standard theory of an asset pricing in frictionless markets. We then review the more cited frictions that beset the market causing various degrees of illiquidity and make the argument that public ownership in small firms constitutes an excess market friction. We isolate the effect of this friction in our sample to (1) prove that it exists, via the statistical significance of our findings and (2) to support theory in prior literature that says that buyers anticipate this fiction with respect to future transactions and apply an appropriate discount.

We further support the theoretical literature that says the long-term investor has the advantage over the short term investor in buying illiquid assets, because it is the long-term investor that is the purchaser of the small firm, typically the owner/operator. The cost of this friction can be amortized less expensively over longer holding periods.

This study compares value of small privately held firms with similarly sized, small publicly held firms when the businesses are actually sold to ascertain the public ownership discount. These results are important to better understand the effects of public ownership and liquidity on the valuation of small firms.

The data show the public ownership discount is pronounced and statistically significant for smaller firms, but is decreasing in firm size, as our theory would predict.

The effect of SOX on the valuation is also considered. We find that, from the stand point of net effect on value, there is a statistically insignificant negative effect on both the firms in our “larger” group and our “smaller” group.
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Standard asset pricing is based on the assumption of frictionless (or, perfectly liquid) markets, where every security or asset can be traded at no cost all the time, and agents take prices as given. (Cochrane 2001; Duffie 2001) In frictionless markets, securities or assets with the same cash flow must have the same price. The intuition is that if securities or assets with identical cash flows had different prices, then an investor could buy (with no trading costs) the cheaper security and sell (with no trading costs) the more expensive security and realize an immediate arbitrage profit. However, with market frictions (e.g. trading costs, illiquidity costs), assets with the same cash flows can have different prices without introducing arbitrage opportunities.

In prior literature, theories on how liquidity affects the required returns of capital assets predict that both the level of liquidity and liquidity risk are priced.

Liquidity is a complex concept. Stated simply, liquidity is the ease of trading a security. One source of illiquidity is exogenous trading costs such as brokerage fees, order-processing costs, or transaction taxes. Every time a security is traded, the buyer and / or seller incurs a transaction cost; in addition, the buyer anticipates further costs upon a future sale, and so on, throughout the life of the security. (Amihud, Mendelson et al. 2005)

Our study speaks directly to the anticipation of further costs upon a future sale. This source of illiquidity constitutes the market friction that is our central topic. Other sources of illiquidity found in prior literature and cited as market frictions are demand pressure, inventory risk, and information asymmetry. Demand pressure arises because not all agents are present in the market at all times, which means that if an agent needs to sell an asset or security quickly, then the natural buyers may not be immediately available. Inventory risk typically refers to the market maker needing to be compensated for being exposed to the risk of price changes while he holds the asset in inventory. Information asymmetry is the risk that the counterparty has private information. These other sources of illiquidity will not be considered or discussed in our study because (1) demand risk is common to all firms that are being sold whole so there is no difference
between public and private firms of similar size in this regard, (2) there is no inventory risk – the observations in our sample are whole firms and as such are never put into inventory by a market maker or third party to await future sale, and (3) there is no reason to expect different information asymmetry between our public and private firms as market provides little if any information on small public firms. Therefore, buyers of either group faces similar due diligent costs to uncover values. This being true, we feel we have controlled exogenous liquidity effects and contend that we are able to isolate the effect of being a public company in each of our size groupings.

We consider a simple model in which firms are illiquid due to a specific cost of trading, and investors are risking neutral and have exogenous trading horizons. This is a special case of Amihud and Mendelson (1986a).

The basic idea is as follows. A risk-neutral investor, who buys a security and expects to pay transaction costs when selling it, will take this into account when valuing the security. The investor knows that the next buyer will do that also, and so on. Consequently the investor will have to consider the entire future stream of transaction costs that will be paid on the security. Then, the price discount due to illiquidity is the present value of the expected stream of transaction costs through its lifetime.

Translating this into the require return of an asset which is costly to trade, we obtain the required return is the return that would be required on a similar asset which is perfectly liquid, plus the expected trading cost per period, i.e., the product of the probability of trading by the transaction cost. (Adapted from (Amihud and Mendelson 1986))

An important assumption at the foundation of our conclusions is that public ownership portion of the firms in our sample amounts to a minority ownership interest. The information about the percentage of ownership held by the public was not available for our data. However, we feel that this is a safe assumption because the firms in our sample were sold through business brokers. The typical situation is one where the owner
operator is trying to cash out and, if he were not the largest shareholder, then it is likely that he would cash out by means of a seasoned equity offering (SEO).

The specific “cost of trading” referred to above in setting up our model is the cost of paying off the public shareholders at the time the firm is sold. It is our contention that investors who are also majority shareholders of small firms are able to exact rents and private benefits, disproportionately greater than their ownership interest. This is the case in all periods that they own the company up to the time that the firm is sold. At the time of sale, there is no uncertainty about the value of firm, there is no information asymmetry, and the minority shareholder is in a position to demand equitable distribution with respect to payment for his ownership share.

Prior literature holds that controlling shareholders frequently own substantially more control rights than cash flow rights. And, they have the power to expropriate non-controlling shareholders, and this power is limited only by legal restrictions and by the controlling shareholders’ incentives not to engage in expropriation. If we assume that expropriation is costly (Burkart, Gromb, and Panunzi (1998)), rational controlling shareholders – in our case owner/operators - face a tradeoff between value-enhancing activities and further extraction of private benefits when maximizing their total utility, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002). Since the owner/operator internalizes only a fraction of negative corporate valuation consequences, but enjoys all of the private benefits, this tradeoff is in favor of private benefits extraction. (Burkart, Gromb et al. 1998; Bebchuk, Kraakman et al. 2000)

Our evidence is consistent with theories by Bebchuk (1999), Bebchuk et al. (2000), and La Porta et al. (2002), which predict that agency costs are large when the cost for controlling shareholders to expropriate non-controlling shareholders is low. (Cronqvist and Nilsson 2003) The public owners of small firms have very little power to control management which makes the agency costs they suffer very high. However, the point at which they have the most power to compel truly equitable distribution is at the point of sale.
Conversely, the point of sale is very costly for the owner/operator on a relative basis. The owner operator will not be able to receive the discounted cash flow value for the private benefits stream. This value goes back to the non-controlling shareholders.

By way of explaining our intuition here, consider a scenario in which two owner/operators have identical cash flows of $75.00 per year from their different firms. The only difference is that operator A gets his by owning 100% of his firms total cash flows, while owner B gets his from owning 50% of his firms total cash flows plus another $25 he expropriates from the firm. To keep the example simple assume that these firms are identical and sell for a multiple of one times cash flow in the current market. Owner A can sell for $75.00; however, owner B gets paid one-third less, $50.00 - because she has rights to only 50% of the $100.00 firm value. This amounts to a huge trading cost for owner B, and even if the next owner of B’s firm feels she can expropriate the same excess, she, too, faces the same huge trading cost to cash out.

We contend that this cost is the friction that is the theoretically the reason why we find a significant discount in the prices paid for small firms that are public. Our empirical findings contradict the rationale of conventional business thinking and current tax practice.

What this study does is compare value of small privately held firms with similarly sized, small publicly held firms when the businesses are sold. This should either determine the existence of a liquidity (or lack of marketability) discount for privately held firms or confirm our theory that public ownership is an added market friction that ultimately discounts the value of firms that are partly owned by the public. Many studies have been undertaken to suggest a liquidity discount of up to 35% for privately held firms’ via comparable public ones. However, these studies all consider other types of securities where some similar securities do not have complete marketability. We consider actual firm sales. Only when a private firm is actually sold does it have a market value. All other values attributed to the firm are merely estimates. This makes most of the current liquidity cost estimates that other studies have found for a closely
held firm very suspect. The real uniqueness here is in using actual sales data for both privately held firms and also publicly held firms.

This is not a comparison of private firm sales against extrapolated values for existing public firms having similar attributes using the on going market prices for shares in those public firms. In that comparison, the private firm value is being compared with the market price of a minority position in a small public firm. While publicly held, these small firms are not usually market controlled as the manager all most always has control of the business.

This study is important to better understand the lack of liquidity in small public firms and the relatively small liquidity advantages in slightly larger firms. This has implications for the valuation estimates of closely held firms for potential sales and/or estimating values for potential tax implications such as gift taxes and estate taxes. The courts in the USA currently allow a substantial discount up to 35% for privately held firm as compared to public competitors as a liquidity discount.

The data show these liquidity discounts are non-existing for smaller firms and much less than expected for larger ones resulting from the excess frictions of agency costs. For the “larger” firms in our study, those with sale values from $100 million to $1 billion, we find that the public firms do sell for a higher value than comparable private firms. However, for the “smaller” firms in our study, those sold with values from $20 to $100 million, the private firms actually have a higher value than the comparably sized firms that have public ownership. Very small public firms possess little or no liquidity as a result of the demand pressure friction discussed earlier – the risk that buyers are not present in the market at the time the seller looks to sell. Thus, the value discounts as a
result of this friction should be the same for both public and private firms. We surmise that only the greater agency costs that exist with the small public firms would account for the public firms selling at significantly lower prices.

I. Literature review

A. Small firm valuation

Long and Sefcik (2001) presented the idea that a closely held firm, even a profitable one, should not necessarily be considered a going concern. They argued that in order for a firm to be a going concern, it must be viable and independent of its original owner/managers influence. Or specifically, can these firms be considered going concerns separate from their current owner/managers? And also, do the firm’s clients and stakeholders view themselves as dealing with the firm or its owner/managers? Usually, the larger firm, the more likely it will be independent from the founding owner/manager, though there are exceptions such as Omni Entertainment and Martha Stewart. As all of the firms this study sold for between $20 million and $1 billion, they are assumed to be independent ongoing businesses though some of the smaller ones might not be.

A broad range of studies exist on the importance of liquidity on value. Two of the more prolific authors in the area are Yakov Amihud and Haim Mendelson. They view liquidity as such an important part of value that their valuation model specifically considers liquidity along with expected cash flows and systematic risk. Their recent review article, “Liquidity, the value of the firm and corporate finance” (Amihud and Mendelson, 2008) points out that researchers consistently find that, after controlling for risk and other relevant factors, the lower liquidity security has a lower price ceteris paribus. Liquidity is usually measured as the bid/ask spread where obviously a lower
spread means a higher liquidity. When considering changes in liquidity over time, smaller firms are most susceptible to decrease in liquidity or liquidity risk. However, their review does not consider the affect of a firm’s liquidity prior to a takeover and its ultimate selling value. That is this study’s focus.

Whereas Amihud and Mendelson view liquidity as the sale of shares, the marketability idea is more general with respect to the item being sold. Bajaj, Denis, Ferris and Sarin (2001) view the marketability as how quickly an asset can be converted into cash without the assets owner incurring substantial transactions costs or price concessions. They review marketability from past studies as falling into one of three approaches. The first group compares the same asset in a period where it is marketable to another period where the asset is non marketable such as an option being vested. The second approach views claims on the same set of assets, i.e. the overall firm, where one set of claims is marketable and the other is non marketable such as the price of CBT options versus similar termed executive stock options. Their final group views the transaction costs rather than price between marketable and non marketable assets again where the assets are similar in other dimensions. These studies all found a significant cost to the lack of marketability in the range of 30-35%.

They then undertake their own study of 125 privately placed equity issues. Their data are for issues between 1980 and 1994. They find a discount range from a -44% to 68% with a mean of 21.8% and the corresponding median of 20.8%. While a 20+% discount is quite large, it is only around 2/3 of the 35% discount that legal courts allow for lack of liquidity and the previous empirical studies found to exist. The difference between the
results of these various prior studies and those of Bajaj, et al. appear to derive more from the assets being compared than the use of a different time period and/or different samples.

Micah Officer (2007) looks at the price of corporate liquidity in comparing the acquisitions discounts for subsidiary targets from public and unlisted firms. He finds that the average acquisition discount for stand-alone private firms and subsidiaries of other firms (unlisted targets) is 15% to 30% when compared to the acquisition multiples for comparable publicly traded firms. The average size of the firms in his samples is substantially larger than those used in our study. The targets means (medians) in millions of dollars are 2,008 (292) for publicly traded targets, 262 (53) for unlisted stand-alone targets and 1,173 (255) for unlisted subsidiary targets.

Long, Chen, Wang and Zhang (2008) take an entirely different view of valuation that results in a similar empirical implication as that for the Amihud and Mendelson (2008) and Officer (2007) liquidity arguments. Using Schumpeter’s *destructive competition*, they argue that an option against a firm’s value exists from new firms and/or inventions that fulfill the original firm’s product market. This gives the firm a lower value than a normal valuation model would predict. They also argue and empirically find that smaller firms and those with less capital market feedback have a greater relative option against value. Obviously, when privately held firms are considered, they get no direct capital market feedback. Further, it is quite questionable how much capital market feedback that small public firms receive that is directly related to the firm. Though their economic argument is different, the empirical implications are the same; illiquid firms, meaning all private firms and smaller public ones will have lower values.
Given this finding, we seek to test whether public ownership inherently creates a positive value differential particularly for a smaller firm, as common valuation practices would seem to indicate. In brief, we find the opposite. Said value differential is, in fact, negative for our sample of small public firms.

B. The effect of Sarbanes-Oxley on liquidity

The Sarbanes-Oxley Act (SOX) was enacted in July 2002. It resulted from the perceived shortcomings of current GAAP after the financial debacles involving some of the most prominent firms in the United States including Enron, Tyco and World Com that followed the dot com crash. The Act’s goal is to improve confidence in the securities markets. The additional SOX requirements should increase the liquidity on the resulting securities.

In brief, SOX mandates (among other things) that management and an outside auditor evaluate the effectiveness of internal controls annually. In addition, SOX tightens disclosure rules, requires management to certify the firm’s periodic reports, strengthens board independence and financial literacy requirements, and raises auditor independence standards that Kamar et al. (2007) summarize.

Proponents of SOX contend that the new requirements provide improved transparency and more accurate information being released to public resulting in improves liquidity (eg., Cunningham (2003), Wagner and Ditmar (2006), Coates (2007)). Opponents contend that SOX merely creates additional expenses for conforming firms (eg., Coustan et al. (2004), Ribstein (2003), Gordon (2003, Romano (2005)) and with efficient markets provides no additional information.

Klingsberg and Noble (2004) note:
Any audit committee member of general counsel will tell you that the most burdensome part of the Sarbanes-Oxley Act of 2002 has turned out not to be the certifications by the CEO and CFO as to the accuracy of the financial statements, the movement toward real disclosure as most recently exemplified by new Form 8-K, or even non-GAAP reconciliation requirement of Regulation G. Memoranda from law firms and accounting firms following the adoption of Sarbanes-Oxley and the initial SEC released pursuant to the statute usually include only vague references to what some insiders and auditors now claim has turned out to be the neutron bomb within Sarbanes-Oxley: Section 404 – Management Assessment of Internal Controls. Nowadays, Section 404 is the focus of and in many circles is literally synonymous with Sarbanes-Oxley.

Kamar et al. (2007) point out that, for policy makers, the crux of the debate must concern SOX’s net effects and it is here that our findings make a contribution to this adjunct body of literature.

There is no dispute that SOX compliance is costly, even though compliance costs have been coming down of late. And, it is especially costly for smaller firms that don’t have the personnel resources or economies of scale of larger firms. Indeed, prior literature holds that small firms may experience a disproportionately larger increase in audit fees because some of the costs associated with establishing, maintaining and evaluating internal controls over financial reporting are fixed and because small firms often lack the staff to perform in-house the additional accounting work (Wolkoff (2005), Carney (2006)). Consistently, Doyle, Ge, and McVay (2007) find that small firms are more likely to have ineffective internal controls than large firms.

On the other hand, from a public investor’s point of view, there is historically more fraud in smaller firms (Kamar et al. 2007) - exception noted for Enron, Tyco, and World Com; therefore some question exists about whether the added burden is worth the
added assurance. Or, as Kamar et al. (2007) put it: “Ultimately, whether on balance SOX imposes a net loss on firms.”

II. Hypotheses and data used

A. Hypotheses tested

Three different hypotheses are presented. The first two deal with differences in market values for privately and publicly held firms being sold and the importance of selling frictions. The traditional argument is that public firms possess liquidity and as a result their on going market values should be valued higher than privately held firms. Being public increases their marketability and hence value. This gives Hypothesis 1, $H_0$: liquidity from being public should increase valuation. $H_A$: valuation is independent of liquidity.

The second hypothesis views public, private valuation differences from the aspects of the selling frictions. The idea here is that the larger firms have a greater equity market resulting in increased liquidity and hence will be priced higher if they are public. The private firms obviously do not have any liquidity in either group making their valuation lower. With the small firms, their market following is too small to obtain any real liquidity and their selling frictions are greater. This gives the following hypothesis related to liquidity of initially private version public firms and whether they are large or small

Hypothesis 2, $H_0$: capital markets from being public should increase liquidity and hence valuation of larger public firms. $H_A$: valuation is independent of firm size.

While the main focus of the study deals with comparing public and private firms at time of sale, another test can be undertaken comparing valuation of the public firms prior and post the Sabine Oxley Act (SOX) being pasted in 2002. If this government
legislation has a positive effect, the public firms after 2002 should sell at a higher relative value than prior. Obviously, the value of private firms should not be affected as the bill deals only with publicly reported data though a private firm considering sale does incur some SOX costs. However, if capital markets are efficient in a strong sense, this will have no effect on valuation as the markets can already see what is happening. This gives the last hypothesis

Hypothesis 3, \( H_0 \): capital market information is improved by SOX and the relative liquidity of public firms increases. \( H_A \): capital market information is unaffected by SOX.

The specific data and empirical runs to test these hypotheses are presented next.

**B. Data base**

The *Mid-Market Comp®* data are used for this study. These are data bases that the National Association of Certified Valuation Analysts sells on firm characteristics at the time of a firms’ sale. Specifically, this study uses their mid and large sized firm data since smaller public firms sales are being compared with larger private firm values at sale. The characteristics that the data contains are accounting data such as last year’s sales, total assets, book value of equity, EBIT, and EBITDA, SIC for the firm, location of the firm, and whether the firm is public or private. The data base also contains data on the transaction such as a cash or stock sale, and a firm sale or asset sale.

While the positive side of this data is containing actual sales data, two potential weaknesses exist in this data. First, it contains only current values for assets, sales, etc. It is impossible to look at any trends. This is partially overcome in considering industry classification and geographical location data. Second, the data are self reported information by the Associations’ individual members. There is no check that it is correct. These data are not necessary from audited financial statements as privately held firms are
not required to produce audited statements. However, it is still the best actual data available for firm sales.

C. Methodology for selecting records to analyze.

Of the 7,599 records in the original data set, only 1804 are used in our analysis. The steps taken to distill the data down to a usable sample set are outlined below. Please note that each sub-heading below names the data step followed by the remaining sample size after that data step is taken.

Original Data – 7,599

We start with 7,599 records containing various data fields documenting the sales of firms including 1) date and terms of sale, 2) information about the parties to the sale, and 3) financial information on the firm being sold limited to basic accounting numbers from the most recent balance sheet and income statement.

1 - Remove Missing Sell Type Data - 6,795

We eliminate 804 records for having missing data in the SEL_TYP field. This is the field that indicates whether the firm sold was public, private or a subsidiary of a larger firm. 6,795 records remain.

2 - Remove Subsidiaries - 5,976

We eliminate 819 records for those firms that are subsidiaries being sold off from larger firms. 5,976 records remain.

3 - Remove Foreign Firms - 5,908

We eliminate 68 records for being located outside North America. Therefore, the firms remaining in our study are all U.S. or Canadian firms. 5,908 records remain.

4 - Remove Transactions Over $1Billion - 5,899
We eliminate 9 records in which the firm sells for a price in excess of $1 billion. We consider these obvious outliers in a study of small to medium sized firms. 5,899 records remain.

5 – Remove Missing Price Data – 5,518

We eliminate 361 records for having missing data in the Price field. This is the field that contains the sale price of the firm. 5,518 records remain.

6 – Remove Financial Firms – 5,032

We eliminate 486 records where the firm is in the financial industry sector since financial firms have sufficiently different levels of assets per value and leverage. 5,032 firms remain.

7 – Remove Missing Assets Data – 4,984

We eliminate 48 records for having missing data in the Assets field. This is the field that contains the book value of the assets of the firm. 4,984 records remain.

8 – Remove Missing Revenues Data – 4,849

We eliminate 135 records for having missing data in the Revenues field. This is the field that contains the total revenues for the firm. 4,849 records remain.

9 – Remove Sale Prices Below $20 Million – 2,006

We eliminate 2,843 records where the firm sells for less than $20 million. Because we intend to study valuation effect differences between private and public firms, we are trying to not go below a market value level where public firms would all but disappear. 2,006 records remain.

10 – Winsorize by 5% using Price/Assets Ratio - 1804
Finally we eliminate 202 records by winsorizing the data 5% (from each end) after ranking the data in order of Price over Assets. We contend that the middle 90% of this ratio eliminates abnormal circumstances such as distress sales and sales that may not be at “arms length”. 1,804 records remain in our final sample set for use in our regression model.

III. Empirical results

This section describes the variables used in our analysis. Our sample data are split into two groups. For simplicity's sake, we have named the group containing the "larger" firms, Large Companies, and the group containing the "smaller" firms, Small Companies. We realize that these are relative terms, indeed the majority of the firms in our Large Companies group would not be considered large by New York Stock Exchange standards. For our large companies, the n = 511, and for our small companies n = 1293. (See, Table 1 below.)

A. Description of variables

The dependent variable in our model is Price.¹ This is the selling price of the firm. The selling prices for our large companies range from $100 million to $988 million with a mean value of $261 million (median, $184 million). Those for our small companies range from $20 million to $99 million with a mean value of $46 million (median, $40 million).

Place Table 1 Here

The independent variables taken from the accounting numbers that best predict selling price are assets, net income, and book value - represented here as Stockholder's

¹ Scaling the dollars values by the firm’s revenues is also used. As it gives similar results only the straight regressions are reported.
To control for the overall trend of the market, we include the value of the Russell 2000 Index (at the time of sale) in our regression model. The rationale is that when market prices of small publicly held firms are higher as represented by the Russell 2000 Index that the market value for total firm sales will be higher. We realize that the prices are typically negotiated well in advance of the actual sale, but assume market fluctuations case by case should cancel out.

From Table 1, the average asset size for large companies is $143 million and for small companies it is $22 million. The values for net income are $0.1 million of average profits for large companies and $1.5 million of average losses for small companies. And, the values for stockholder's equity are $39 million and $4 million, respectively.

A dummy variable to measure the effect of being a public company is included in the model, labeled DumPub. In the group of large companies, 30% (153) are publicly held, and 70% (358) are privately held. In the group of small companies, 12% (154) are publicly held, and 88% (1,139) are privately held. The sign and significance of this variable basically gives the affect of being public on these firm’s valuations. This initial liquidity value tests are first two hypothesis.

A dummy variable to measure the effect of the type of sale - type referring to what was actually sold, the firm's stock or the firm's assets – is included in the model. This dummy variable is labeled DumTerm. For large companies, sales of stock were 83% of transactions (425) versus 17% (86) for sales of assets. For small companies, sales of stock were 74% of transactions (956) versus 26% (337) for sales of assets.

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2 EBITDA is also considered as an explanatory variable. It gives slightly more significant results than Net income, but because of missing data the sample size is only 60% as large. Therefore, we use Net income.
A dummy variable is included in the model to measure the effect of Sarbanes-Oxley on public companies in those years affected by the Act, 2003 through 2006. It is labeled DumSox. For large companies, Sox affected 14% of firms (69). For small companies, Sox affected 5% of firms (32). As SOX was passed in the middle of 2002, we felt it would take some time before its affects were understood and incorporated into the valuation process. We also tried the SOX dummy starting in 2002 feeling that the market would incorporate the future effects into prices and obtained similar results. We have only reported those with SOX dummy starting in 2003.³

To control for industry segment affects each company in the sample data set was assigned to one of 18 different industry segments. Regressions were run to determine in which industry segments membership mattered, on the basis of statistical significance. Only five industry dummy variables showed statistical significance in either group and none showed statistical significance in both groups. The aforementioned five (representing the pharmaceutical, computer software, professional services, communication services, and general manufacturing industries) are included in the model and are described at the bottom of Table 1.

Finally, we try three different sets of variables to capture any geographical effects. Now smaller firms should be affected much more by location as they operate in limited geographical regions. They are much more likely to have a majority of their operations and sales in their headquarter state.

First, we classify states into areas such as North East, South East, etc. From these six groups using the Canadian firms as our holdout sample, we find only the “Western

³ SOX could affect currently private firms whose owners are considering a sale. They want to comply with SOX to give greater confidence to potential buyers whether public or private. Therefore, we also test all firm sales after 2002 and 2003 as well.
States” (CA, OR, & WA) are significantly related with a positive coefficient. 22% of the firms sold in both groups are in one of the three western states.

The second group rates states by their “Economic Freedom Index.” (McQuillan, et al., 2008). This index is a tool for measuring relative economic freedom for businesses under the varying state regulations including welfare payments that distract from “freedom.” The rankings for 2004 are used as they are approximately in the middle of our data’s time period. We create two dummies for the “most free” dozen states (ID, CO, UT, WY, NV, OK, NH, VA, KS, DE, AZ, & MO) and the “least free” dozen state (NY, RI, NJ, CA, PA, OH, CT, MA, LA, MN, IL, KY & WI). We thought that firms operating in states with greater economic freedom would be valued higher. Not so, the empirical results find those firms sold in the twelve states with the least government freedom are valued slightly higher and those in the dozen with the most economic freedom show a slight negative value. The result could come from the better states to operate in allow for greater profits. These are incorporated into the firms’ values causing no effect on valuation. Since the results of these dummy variables are slight and difficult to explain in economic terms, they are not included in our final analysis.

The third approach to geographical location and valuation deals with “right to work” states. These 22 states have laws against “closed shops” or forced labor union membership. Not surprisingly, a high overlap exists with our “economic freedom” dummies. Only Louisiana has right to work rules and is in the least free 12 states. The most free 12 states find only four states (MO, NH, CO and DE) without right to work laws. The empirical runs find no relationship between valuation and whether the firm is in a
“right to work” state. This is a sign that labor unions have little affect on wages and/or operating practices of smaller firms.

B. Empirical results

The regression model utilizing the variables described above is run with the following results.

Place Table 2 Here

The model for large companies has an R-Squared and Adjusted R-Squared of 0.50 and 0.49, respectively. And, the model for small companies has an R-Squared and Adjusted R-Squared of 0.29 and 0.29, respectively.

Book value of assets is the leading and most statistically significant predictor of value in the model. For large companies the coefficient for assets is 0.75 with a t value of 17.07. For small companies the coefficient for assets is 0.59 with a t value of 21.93. Both are very statistically significant. Remember that a coefficient of 1.0 would say that selling price is equal to the asset’s book value.

The annual net income is statistically significance with both small companies having a coefficient of 0.20 and the large companies having a coefficient of 0.49. The stockholder's equity has a small but negative coefficient with small firms, but again this is not statistically significant. With the large firms, stockholder’s equity is positive but again it is not statistically significant.

The Russell Index is used in the model to reflect and control for the over all market level. The argument is that when the market is up for smaller public firms one should expect higher values on all firms. It shows a positive statistical significance with both groups.
Dummy variables also are used including the geographical variables. As discussed earlier, only the west region of all the geographical variables shows a significant affect on valuation. The west region has higher values for both groups though for the smaller firms the coefficient is significant only at the 10% level.

The last dummy deals with what is being sold: the firm’s assets or its stock. Stock sales brought a surprisingly significantly higher value. One would expect to see straight asset sales to have a higher value as no potential previous liabilities are attached to the new owners. In selling stock the medium of exchange is most likely stock from the buying firm. This lowers the buyer’s transaction costs in not having to raise funds and also provides an indirect guarantee from the seller who is willing to accept stock instead of straight cash.

However, the dummy variable showing the effect of being a public firm is statistically significant in both groups, large and small companies. For large companies the coefficient is positive and quite large, at 32.04, considering that average price is 261 (coefficient is 12% of average). For small companies the coefficient is negative, at -5.13, and still large considering that average price is 46 (coefficient is -11% of average).

**C. SOX tests**

We find that, from the stand point of net effect on value, there is a statistically insignificant negative effect on the firms in both our “larger” group and in our “smaller” group in testing the effect of SOX on value. Such findings are consistent with the conjecture that, if the capital market is already efficient so there is less benefit to balance the added costs of SOX compliance. Obviously, the benefit of additional reporting
requirements to lend greater assurance to financial reporting numbers is not valued by the market nearly enough to offset the “drag” on value imposed by SOX compliance costs.

On Table 1, the variable DumSox is described as being assigned the value “1” for those records containing firms that are public and subject to SOX because they sold in the year 2003 or later. The year 2002 is considered prior SOX given the difficulty of discerning whether transactions that closed in the first half of that year might have been influenced by the anticipation of the new statute which was formally enacted in July 2002. By excluding 2002, the sample thus permits a clean comparison of those transactions that are structured before the market is aware of SOX and those transactions that are structured after such awareness is widespread.

D. Summary of results

Were our hypotheses confirmed? We find our larger firm sample gives a greater value while our small firm sample finds that the public firms have a significantly lower price. Our sample gives a split outcome on the first hypothesis and is consistent with the null on the second. The SOX test shows no increase in selling values having us accept the alternative. We now want to try and explain our liquidity results from reconsidering the liquidity of small firms in selling costs of selling shares and entire firms

IV. Liquidity costs with smaller firms

Unlike public firms, closely held firms have no established market values except when they are sold. The small public firms appear to offer liquidity through continuously being traded, however this seems to be misleading because of our data show that these

\footnote{The results from SOX dummy including 2002 gives nearly identical results.}

\footnote{We also included a dummy for both public and private firms using arguments from DiGabriele (2008). He argues and empirically finds that private firms have similar costs when putting themselves in play to be sold with a sample of larger firms. We obtain opposite results with our sample as they are the same as our results with just public firms.}
firms traded at significantly lower prices, which indicates that they are more costly to trade. The discussion now focuses on comparing the costs to sell an entire small to intermediate sized firm with the costs involved in selling shares of the public firm. We find the selling frictions outweigh the very expensive liquidity in small sized public firms that we feel gives us our empirical results. The initial valuation data presented finds no marketability advantage for firm between $20-100 million in sales value in being public while an advantage is found with those between $100 million and $1 billion. But, what are the relative costs in selling an entire firm versus just selling shares in smaller firm?

In discussing these firms’ sale values with Alan Scharfstein of DAK Group that is an investment banking firm which specializes in brokering sales of closely held mid-cap firms ($5 to $50 million as an approximate market range), he notes that closely held firms usually sell at extremely low multiples of earnings, unless the buyer has a strategic motive. A sale of five times the earnings seems to be a good price. If one assumes zero growth opportunities as a good approximation for most of these closely held firms, this imply a 20% required rate of return if there is no deduction of the asset’s value for a possible “unwritten call against value” as discussed in Long et al. (2008).

One usually argues that it is the low liquidity of the closely held firms that drives their lower sale values though the initial data show otherwise in the value obtained in selling an entire firm. Consider the actual costs of obtaining cash from selling the small, closely held firm. These costs are approximated in two different ways. First, though not a direct measure of liquidity costs, an approximation can be found from the costs incurred in selling the entire small firm. From DAK’s, commissions for selling closely held firms estimates ranged from around 10% for a $1 million business down to only 3 to 4% for a
$10 million deal, as shown in Table 3. Brown (2006) gives similar estimates in his book, where a sale of business worth less than $5 million will have commissions ranging from 5-10%, a sale worth $5 million to $10 million will have commissions around 5%, and larger deals over $10 million having commissions less than 5% declining with size. As this study’s two groups have median sizes of $41.6 and $193.8 million, the total selling commissions should be expected to be in the range of 3.5% and 2.5% of selling value, respectively.

**Place Table 3 Here**

Approaching selling frictions/liquidity costs from the cost of selling shares in a very small public firm is now considered. The costs of buying and selling shares by firm size groups using the average bid/ask spread are estimated. To investigate the size of the spread by firm size, COMPUSTAT data are used to measure the overall market value of equity. Firm size groups are then created with $10 million spreads starting from 0-$5 million, then $5-15 million, up to $300 million. The daily TAQ (Trade and Quotes) data are used to measure the bid/ask spread for the size groups. NASDAQ firms with market values between $5 and $15 million are selected initially as the smallest firms. For these 123 small public firms, the average quoted bid/ask spread is slightly over 8.7%. For the average spread for the two groups in this study, the smaller group with a $41.6 million median finds a 4.1% spread from 133 firms and the larger sized firms with a $193.8 million median have a 2.3% spread from 46 firms. These spreads in selling shares are almost identical to the 3.5% and 2.5% estimated costs in selling the entire firm.6

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6 The actual costs to an individual buying or selling a share of stock are estimates as slightly over half the bid/ask spread. This assumes half is incurred by each party in the transaction. Similarly in the costs of selling an entire firm, the costs represent the spread between what the buyer pays and the seller receives. Hence the entire spread is the best estimate of total costs in buying/selling firms.
The perceived large costs in selling a closely held firm do not really exist. These costs are almost identical to a major owner of a similar sized public firm selling a few shares to obtain funds. While costs are similar the time aspect of liquidity still varies. Selling an entire business usually requires several years while selling a position in a public firm is done within a day. However, the cost of liquidity comes at a high price with small public firms.

VI. Conclusions

A comparison between the selling costs of small and intermediate sized private firms versus the costs of selling shares in comparably sized public firms finds them almost identical. Our empirical results find that intermediate sized firms (those selling between $20 and $100 million described as the small companies group in our study) that are public actually sold for lower values than similar sized and characteristic privately held firms. This shows the effect of an excess friction present in smaller companies that are public. Our findings support prior theory that relates the cost of exiting an investment to a market friction that should be discount to entry price. The high cost of satisfying public, non-controlling shareholders at the time the firm is sold is that market friction in our study.

Thus, we conclude that there is no validity to the concept of a liquidity discount for small firms that are not public as the data show these liquidity discounts are non-existing for smaller firms and much less than expected for larger ones. For the “larger” firms in our study, those with sale values from $100 million to $1 billion, we find that the public firms do sell for a higher value than comparable private firms. The theory in these cases indicates that, as public firms become increasingly large, it must become more costly
insiders to expropriate wealth from the firm. So, as public firms become increasingly
large, this friction must become increasingly small.

It is reasonable to expect that, for the “smaller” firms in our study, without
expropriation of wealth by insiders, the values should be the same between the public and
private firms. Therefore, because of high relative agency costs, shareholders of small
public firms are willing to sell the businesses at significantly lower prices to get their best
possible values.

The SOX requirements show a slight decrease in the public firm values at sale. It
shows no significant change with either group of firms, but the sample size of public
firms sold after SOX is implemented is too small to draw a definite conclusion. The
market for entire businesses places an insignificant negative value on SOX without
consideration of the firm’s compliance costs as they are sunk costs. Remember a private
firm buying a smaller public firm will avoid further compliance costs and similarly
another public firm buying a firm must incur SOX costs in auditing the new portion
regardless of whether initially private or public. This data show SOX to be marginally a
loser. All it does is increase the cost of being public. Of course, this ignores any political
implications of the government doing something positive to “protect the public.”

References

Financial Economics 17, 223-249.

Amihud, Y., H. Mendelson, et al., 2005, Liquidity and asset prices, Foundations and
Trends in Finance 1, 1-96.


Table 1 Description of Variables in Model
DATA ON COMPANIES SOLD FROM 6/1996 TO 12/2006

<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Companies in Group</td>
<td>511</td>
<td>1,293</td>
</tr>
</tbody>
</table>

Listed below are the components of the regression analysis for each grouping of companies

**Dependent Variable:**
Sale Prices (in millions):
<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Value in Group</td>
<td>$988.00</td>
<td>$99.40</td>
</tr>
<tr>
<td>Lowest Value in Group</td>
<td>$100.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>Mean</td>
<td>$261.04</td>
<td>$45.55</td>
</tr>
<tr>
<td>Median</td>
<td>$183.90</td>
<td>$40.00</td>
</tr>
<tr>
<td>Std Deviation</td>
<td>$190.09</td>
<td>$21.04</td>
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</tbody>
</table>

Independent Variables: (Accounting)

Assets (in millions):
<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Value in Group</td>
<td>$1,269.00</td>
<td>$145.00</td>
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<td>Lowest Value in Group</td>
<td>$4.40</td>
<td>$0.89</td>
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<td>Mean</td>
<td>$143.08</td>
<td>$22.42</td>
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<tr>
<td>Median</td>
<td>$91.80</td>
<td>$16.00</td>
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<td>Std Deviation</td>
<td>$165.84</td>
<td>$21.22</td>
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</table>

NetIncome (in millions):
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<thead>
<tr>
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<th>Large Companies</th>
<th>Small Companies</th>
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</thead>
<tbody>
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<td>Highest Value in Group</td>
<td>$130.00</td>
<td>$59.20</td>
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<tr>
<td>Lowest Value in Group</td>
<td>-$285.90</td>
<td>-$169.20</td>
</tr>
<tr>
<td>Mean</td>
<td>$0.13</td>
<td>-$1.49</td>
</tr>
<tr>
<td>Median</td>
<td>$3.73</td>
<td>$0.95</td>
</tr>
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<td>Std Deviation</td>
<td>$32.99</td>
<td>$11.35</td>
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Stockholder’s Equity (in millions):
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<thead>
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<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Value in Group</td>
<td>$508.90</td>
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<tr>
<td>Lowest Value in Group</td>
<td>-$661.50</td>
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<tr>
<td>Mean</td>
<td>$39.44</td>
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<tr>
<td>Median</td>
<td>$25.00</td>
<td>$3.70</td>
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<tr>
<td>Std Deviation</td>
<td>$97.93</td>
<td>$19.12</td>
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</table>
Table 1, Continued

**Independent Variable:** ([Market Index])
Russell 2000 Index
Index Close on the date the company was sold.

**Dummy Variable:** ([Public vs Private])
DumPub
In this variable public co.s=1; private co.s=0
Public Companies in Group (%) 153 (30%) 154 (12%)
Private Companies in Group (%) 358 (70%) 1,139 (88%)
Totals 511 (100%) 1,293 (100%)

**Dummy Variable:** ([Type of Purchase])
DumTerm
In this variable purchases of Stock =1; purchases of Assets=0
Purchases of Stock (%) 425 (83%) 956 (74%)
Purchases of Assets (%) 86 (17%) 337 (26%)
Totals 511 (100%) 1,293 (100%)

**Dummy Variable:** ([Sarbanes-Oxley])
DumSox
Public co. sales in year 2003 and beyond=1; all else=0
Public Companies sold in 2003 and after (%) 69 (14%) 32 (5%)
All Others (%) 442 (86%) 1,261 (95%)
Totals 511 (100%) 1,293 (100%)

**Independent Variables:** ([Industry Effects])
(Of 18 initial industry groupings established to examine industry effects, only the 5 below showed statistical significance and were retained in the model)

**Dum2830**
This variable=1 for all co.s where SIC code has first three digits “283”; else=0
Industry Sector=Pharmaceutical Mfg and Sale
Companies belonging to this Sector (%) 34 (3%) 25 (5%)

**Dum7370**
This variable=1 for all co.s where SIC code has first three digits “737”; else=0
Industry Sector=Computer Software Dev, Internet prov or Info Tech
Companies belonging to this Sector (%) 297 (23%) 101 (20%)

**DumProf**
This variable=1 for all co.s where SIC code has first two digits “87”; else=0
Industry Sector=Professional Services
Companies belonging to this Sector (%) 59 (5%) 17 (3%)
### Table 1, Continued

**DumComm**
This variable=1 for all co.s where SIC code is between 4812 and 4899; else=0
Industry Sector=Communication Services
- Companies belonging to this Sector (%) 47 (4%) 19 (4%)

**DumMfg**
This variable=1 for all co.s where SIC code is between 2011 and 3999; else=0
Industry Sector=General Mfg
- Companies belonging to this Sector (%) 419 (32%) 209 (41%)

**Independent Variable:(Regional Effect)**
(Of 12 dummy variables used to variously subdivide the United States and Canada, only the 1 below shows statistical significance and is retained in the model.)

**DumWest**
This variable=1 for all co.s located in CA, OR, or WA; else=0
- Companies in CA, OR, or WA. (%) 112 (22%) 279 (22%)
Table 2 Regression Model
COMPANIES SOLD FROM 6/1996 TO 12/2006

<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
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</thead>
<tbody>
<tr>
<td>R-Squred of Model</td>
<td>0.5</td>
<td>0.29</td>
</tr>
<tr>
<td>Adjusted R-Squared</td>
<td>0.49</td>
<td>0.29</td>
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</table>

**Dependent Variable:**
Sale Prices (in millions):

**Independent Variables:** *(Accounting)*

<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets (in millions):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assets Coefficient</td>
<td>0.745</td>
<td>0.590</td>
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<td>Standardized (Beta)</td>
<td>0.650</td>
<td>0.595</td>
</tr>
<tr>
<td>Assets t value</td>
<td>17.070</td>
<td>21.930</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
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</thead>
<tbody>
<tr>
<td>Net Income (in millions):</td>
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<td></td>
</tr>
<tr>
<td>Net Income Coefficient</td>
<td>0.496</td>
<td>0.205</td>
</tr>
<tr>
<td>Standardized (Beta)</td>
<td>0.086</td>
<td>0.111</td>
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<tr>
<td>Net Income t value</td>
<td>2.340</td>
<td>4.190</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockholder’s Equity (in millions):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stk Equity Coefficient</td>
<td>0.096</td>
<td>-0.025</td>
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<td>Standardized (Beta)</td>
<td>0.050</td>
<td>-0.022</td>
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<tr>
<td>Stk Equity t value</td>
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<td>-0.840</td>
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</table>

**Independent Variable:** *(Market Index)*

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Russell 2000 Index</td>
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<td></td>
</tr>
<tr>
<td>Mkt Index Coefficient</td>
<td>0.032</td>
<td>0.002</td>
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<td>Standardized (Beta)</td>
<td>0.087</td>
<td>0.057</td>
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<tr>
<td>Mkt Index t value</td>
<td>2.510</td>
<td>2.340</td>
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</table>

**Dummy Variable:** *(Public vs Private)*

<table>
<thead>
<tr>
<th></th>
<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>DumPub</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DumPub Coefficient</td>
<td>36.512</td>
<td>-5.131</td>
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<td>Standardized (Beta)</td>
<td>0.088</td>
<td>-0.079</td>
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<tr>
<td>DumPub t value</td>
<td>2.000</td>
<td>-2.800</td>
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</table>

**Dummy Variable:** *(Type of Purchase)*

<table>
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<tr>
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<th>Large Companies</th>
<th>Small Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>DumTerm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DumTerm Coefficient</td>
<td>32.040</td>
<td>3.500</td>
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<tr>
<td>Standardized (Beta)</td>
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<td>0.068</td>
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<td>DumTerm t value</td>
<td>1.850</td>
<td>2.780</td>
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</table>
### Table 2, Continued

**Dummy Variable: (Sarbanes-Oxley)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standardized (Beta)</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DumSox</td>
<td>-28.890</td>
<td>-0.052</td>
<td>-1.210</td>
</tr>
<tr>
<td>Dum2830</td>
<td>115.151</td>
<td>0.130</td>
<td>3.910</td>
</tr>
<tr>
<td>Dum7370</td>
<td>64.710</td>
<td>0.136</td>
<td>3.380</td>
</tr>
<tr>
<td>DumProf</td>
<td>52.142</td>
<td>0.049</td>
<td>1.480</td>
</tr>
<tr>
<td>DumComm</td>
<td>64.574</td>
<td>0.064</td>
<td>1.930</td>
</tr>
<tr>
<td>DumMfg</td>
<td>22.891</td>
<td>0.059</td>
<td>1.530</td>
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</table>

**Independent Variables: (Industry Effect)**

<table>
<thead>
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<th>Variable</th>
<th>Coefficient</th>
<th>Standardized (Beta)</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dum2830</td>
<td>115.151</td>
<td>0.130</td>
<td>3.910</td>
</tr>
<tr>
<td>Dum7370</td>
<td>64.710</td>
<td>0.136</td>
<td>3.380</td>
</tr>
<tr>
<td>DumProf</td>
<td>52.142</td>
<td>0.049</td>
<td>1.480</td>
</tr>
<tr>
<td>DumComm</td>
<td>64.574</td>
<td>0.064</td>
<td>1.930</td>
</tr>
<tr>
<td>DumMfg</td>
<td>22.891</td>
<td>0.059</td>
<td>1.530</td>
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**Independent Variable: (Regional Effect)**

<table>
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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standardized (Beta)</th>
<th>t value</th>
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</thead>
<tbody>
<tr>
<td>DumWest</td>
<td>49.408</td>
<td>0.108</td>
<td>3.170</td>
</tr>
</tbody>
</table>
Table 3
Approximate Selling Costs for Closely Held Firms
Values from DAK Group, brokers in closely-held Midcap firms

<table>
<thead>
<tr>
<th>Value of Business</th>
<th>% Selling Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $500,000</td>
<td>12%</td>
</tr>
<tr>
<td>$1,000,000</td>
<td>10%</td>
</tr>
<tr>
<td>$2,000,000</td>
<td>7%</td>
</tr>
<tr>
<td>$5,000,000</td>
<td>4-6</td>
</tr>
<tr>
<td>$10,000,000</td>
<td>3-4%</td>
</tr>
</tbody>
</table>