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The impact of the Sarbanes-Oxley Act on the Cost of Going Public

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The impact of the Sarbanes-Oxley Act on the Cost of Going Public

ABSTRACT

We examine the impact of the introduction of the Sarbanes-Oxley Act on the Cost of Going Public. We find a statistically significant increase in the cost of going public of about 90 basispoints of gross proceeds due to substantially higher accounting and legal fees. Meanwhile, the fees paid to underwriters remain unchanged. Smaller firms are by far more heavily affected than larger firms, as the SOX-effect turns out to have a fixed-cost character. In fact, while we show that firms with an offering size of $250 millions are almost unaffected by SOX, the flotation cost increase for offerings up to $100 millions is at a relatively stable level of 0.5 million year 2000 dollars. We control our results for a potential selection bias by applying a propensity score matching approach. Overall the results suggest that SOX might have improved the amount and quality of information being available within the IPO process. As IPO pricing is highly related to the degree of publicly available information, our findings therefore have also implications for current research on underpricing.

JEL Codes: G18, G24, G32

Key words: auditing and legal fees, IPO, flotation cost, going public, propensity score matching, selection bias, SOX, underpricing, underwriting fees

1. Introduction

It is commonly agreed that the enactment of the Sarbanes-Oxley-Act (SOX) in 2002 has imposed substantial additional regulatory cost on publicly traded firms in the US. This, however, gives no indication on the sign of the welfare effects of SOX. In fact, it might well be that increased transparency, reliability and accountability in the corporate sector altogether outweighs the additional cost of compliance. For the time being, the empirical literature regarding the market's reaction to the introduction of SOX is still inconclusive.[1] Some papers document effects that are in accordance with the view that overall the cost of capital should have decreased. For instance, Jain et al. (2006) show that market liquidity improves after the enactment of SOX. Jain and Rezaee (2006), Li et al. (2008), and Chhaochharia and Grinstein (2007) document positive abnormal returns over periods surrounding rulemaking events.

However, other papers indicate that the net wealth effect of SOX might be negative. By comparing stock price movements of foreign firms with US-based firms Zhang (2007) deduces that the costs of SOX largely outweigh their benefits. Also, Engel et al. (2007) document negative market reactions which are most pronounced for smaller firms. Wintoki (2007) finds an effect on firm value, although he shows that price reactions depend on firm characteristics related to its corporate governance set-up. Litvak (2007) finds that cross-listing premiums of foreign issuers have declined after the introduction of SOX. Evidence quoted by Carney (2006) indicates that premiums of D&O insurances have increased substantially after the enactment of SOX, and he furthermore presents evidence for an increasing tendency towards exiting the public market in the US (i.e., going private) after the introduction of SOX. Kamar et al. (2007) calculate that for smaller listed firms it has become more likely to be sold to private investors.

Research regarding the impact of SOX on the US IPO market is rare. Bargeron et al. (2006) show that the likelihood of undertaking an IPO in the US has decreased compared to the likelihood of undertaking the IPO in the UK, and Leon (2006) shows that the US have lost market share in global equity offerings. Both papers, however, argue that their findings are the result of what companies have to expect to fulfil when being public. In this sense, the question whether the provisions of SOX already materialize at the IPO stage has neither been addressed nor answered. This, however, is an important question, as SOX claims to improve transparency, reliability and accountability in listed firms. If this is the case, SOX should have an impact on information production for firms aiming to go public.

[1] For a comprehensive overview on this issue cf. Coates (2007).

This paper intends to fill this gap by examining whether SOX has had an impact on IPOs in the U.S. We approach this issue by looking at the direct costs of going public, and this for two reasons. First, the direct costs and its components are very well documented and allow for a profound empirical analysis. Second, the costs associated with the offering can well be regarded as a proxy for the level of effort invested by different players in the IPO process such as underwriters, accounting firms and legal firms. Higher costs for information production should potentially lead to more or higher quality information being available to investors.

For the empirical analysis, we form a data sample consisting of 1,116 IPOs which took place at either NASDAQ or NYSE between 1998 and 2007, and analyze several components of the direct costs of going public. Our main findings can be summarized as follows. We find a statistically highly significant increase in the cost of going public of about 90 basispoints of gross proceeds. This increase is almost entirely due to an increase in accounting and legal fees, while the underwritings fees are almost unaffected by SOX. Moreover, we can show that the increase in flotation costs is to a large extent an increase in fixed costs. Specifically, for firms with proceeds of up to $100 millions the increase is relatively stable at 0.5 million year 2000 dollars. Hence, SOX has had a substantial impact on flotation costs for small firms, while the effect seems to be negligible for larger firms.

Furthermore, we show that our results are not driven by a selection bias due to a changing composition of the IPO firms after SOX. For that purpose we test the robustness of our results on the basis of a matched sample approach. Using the propensity score matching technique we estimate what would have been the flotation cost if a firm went public before the SOX enactment instead of afterwards. We show that the findings are almost the same when applying this matched sample approach.

The paper is organized as follows: Section 2 and 3 briefly discuss the Sarbanes-Oxley Act of 2002 and its impact on the direct costs of going public. In Section 4, we describe the dataset and present the empirical results. Section 5 summarizes the main findings.

2. Relevant Aspects of the Sarbanes-Oxley Act of 2002

The main intention of SOX was to improve transparency in public companies by enhancing disclosure and monitoring requirements, preventing gatekeeper failure, and improving risk management systems. With this agenda, SOX was the direct response to a number of accounting scandals in 2000 and 2001 with the one of

Enron being the most prominent example.[2] The Act tries to disengage both legal and illegal activities which disable the investor to proficiently value a company. Earnings management or window dressing could be mentioned as legal activities, while manipulation of accounting information or concealment of material information could be regarded as illegal activities.

The rules on financial disclosures require public companies – among other things – to inform about off-balance sheet transactions and to provide pro forma balance sheets. The enhanced disclosure rules should substantially increase publicly available information and thus improve the transparency of public companies. The provisions on internal controls (Section 404) require public companies to thoroughly disclose risks and to report on its disclosure controls and procedures – a burdensome requirement which has been blamed most for consuming enormous organizational resources.

Its widely extended monitoring requirements are another focal point of SOX. The Act obliges auditors to assess and audit the internal control structures. New internal controls are defined by the Act (Section 404) and range from internal monitoring systems of operating performance and internal liabilities to an independent audit committee. The whistleblower regulations of Section 806 are another form of monitoring, making executives subject to scrutiny by their subordinates.

SOX also introduces a set of measures to regulate gatekeepers in order to enforce its monitoring requirements.[3] In this context the Public Company Accounting Oversight Board (PCAOB) is a major innovation brought about by SOX. The Board is a completely new independent institution regulating audit companies and defining audit standards. In order to avoid potential conflicts of interest, audit companies are prevented from cross-selling services to their audited companies. The same is true for investment banks that have to separate their research on underwritten companies from the capital markets team. By ruling out potential conflicts of interests, investors can be assured that gatekeepers provide fair assessments of the financial condition of companies going or already being public. In particular, the problem of analysts overstating the value of a company trying to go public is addressed, and many forms of influencing the analysts' opinion have been outlawed by SOX. Martin (2008) presents evidence for the notion that conflicts of interests of analysts have been reduced by SOX. Overall, the pressure on gatekeepers to perform a fair and objective job has substantially increased.

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[2] For a discussion of the roots and intentions of SOX see e.g. Ribstein (2005).
[3] Ribstein (2005), pp. 5f. defines gatekeepers as "senior executives, independent directors, large auditing firms, outside lawyers, securities analysts, the financial media and debt rating agencies". The accounting scandals in the early 2000s showed that the gatekeepers in place failed to do their jobs, often caused by conflicts of interests.

It is thus not surprising that Eldrige and Kealy (2005) find an average increase in audit fees from 2003 to 2004 of $2.3 million. Furthermore they find that SOX audit costs increase with size, but that the SOX audit unit costs vary inversely with size, which indicates that large companies are able to benefit from economies of scale.[4] Another study finds the increase of accounting and legal fees to be 62 percent on average since January 2004.[5]

3. SOX and the cost of going public

Ritter (1987) and Lee et al. (1996) separate the total costs of going public into direct costs (gross underwriter spread plus other expenses related to the offering) and indirect costs (initial underpricing). Subsequently, we will briefly discuss the direct cost components - which are in the focus of this paper - and the eventual impact of SOX on these components.

The most important direct cost component in an IPO is the gross spread (=underwriting fee), which the issuer has to pay to the underwriting syndicate. Chen and Ritter (2000) document a pronounced clustering of underwriting fees at 7 percent, leading them to coin this phenomenon as the "7 percent rule".[6] Hansen (2001) examines the question whether this 7 percent rule is the result of collusion among underwriters. The author does not find supporting evidence in favour of the collusion theory. In contrast, he suggests the 7 percent contract to be "an efficient innovation that better suits the IPO" while competition would rather take place on reputation, placement service, and underpricing. However, the ex-ante expected net effect of SOX on the underwriting fee seems ambiguous. On one side, it could be argued that having to make a firm SOX-compliant is a challenge that affects the services offered by the underwriter and therefore makes them costlier. On the other side, however, legal responsibility is shared among more players after SOX and the degree of asymmetric information between the issuer and the underwriter may be reduced as well, which should have a mitigating impact on underwriting fees.[7] Overall we do not have a clear prediction of the impact of SOX on the net effect on the underwriting fees. Regarding the findings of Hansen (2001) it is also likely that underwriter fees remain completely unchanged.

The remaining direct costs include other non-underwriting fees like all remaining costs related to the offering such as exchange listing and SEC registration fees,

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[4] Cf. Elridge/Kealy (2005) p. 2.
[5] Cf. Carney (2006), p. 146-147.
[6] In other markets, however, clustering seems to be less present, as has been documented by Torstila (2003) or Kaserer and Kraft (2003). In earlier papers Ritter (1987) and Lee et al. (1996) reported even for the U.S. a negative relationship between IPO size and the gross spread.
[7] For example, Kaserer and Kraft (2003) document that underwriting fees increase monotonically with the degree of complexity in an IPO, and that underwriting fees are significantly lower for less volatile stocks.

printing and marketing expenses, accounting and legal fees. The introduction of SOX should have affected these cost components in at least two ways: Higher compliance costs in general and additional costs associated with the implementation of SOX. Compliance costs primarily result from additional disclosure and monitoring requirements. Accounting and legal fees are expected to increase substantially as the responsibilities of audit companies have been widely extended. Retaining work papers and peer reviews for seven years and auditing the internal monitoring systems of public companies are just a few of the additional responsibilities of auditors. Furthermore, audit companies face additional costs for funding the Public Company Accounting Oversight Board (PCAOB) and annual quality reviews, which they pass on to their clients. Changing auditors every five years is another costly requirement.[8] Although most of these cost items tend to increase the firm's cost of *being* public, they will most likely also have an impact on the cost of *going* public, as on that occasion auditing mechanisms have to be implemented for the first time. Overall, we would therefore expect the non-underwriting direct costs of going public to have increased in the after-SOX era.

4. Empirical results

4.1 Data

Our database integrates data from Thomson's Securities Data Company's (SDC) New Issues database and covers a 10-year period from January 1998 to December 2007. We eliminate all Financial and Real Estate companies, foreign issuers, ADRs, ADSs and offerings with an offer price of less than five Dollars. We furthermore make several adjustments and exclusions where the data provided seem to be inaccurate or contradicting. This leaves a total of 1116 bookbuilding IPOs.[9]

Most of the company specific data comes from Thomson's Securities Data Company's (SDC) New Issues database. We obtain the offer price, proceeds raised, the number of primary and secondary shares issued from Thomson's SDC database. The numbers from Thomson are cross-checked with general IPO data provided by the NASDAQ-Homepage, which provides information about all IPOs taking place in the US. The information on underwriting fees and other expenses such as legal and accounting fees are hand-collected from the registration statement S1 as filed with the SEC.

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[8] Cf. Morrison (2004), p. 8.

[9] In order to have a sample which represents the whole IPO market over the period covered we do not exclude unit and tranche offerings. However, robustness tests which exclude such offerings do basically reveal the same results.

All monetary values are stated in dollars and converted to purchasing prices of the year 2000 in order to control for inflation. Underpricing is defined as the first trading day return. To rank each underwriter, we use Loughran and Ritter's updated measures of Carter and Manaster's (1990) underwriter quality. Ranks range from zero to nine, with higher ranks representing higher-quality underwriters. For the empirical analysis, we use a reputation dummy which is coded 1 in case of a rank of at least eight and 0 otherwise. The data on company founding dates comes from the Field-Ritter dataset of company founding dates. The age of a company is denoted in years and calculated as the difference between founding and issuing date.

Finally, we classify firms into several industry groupings. Firms that SDC defines as belonging to the high-tech industry are classified as technology firms.

4.2 Analysis of the direct costs

4.2.1 Descriptive statistics

Table 1 reports descriptive statistics for the whole sample. On average, a company going public has to pay 9.28 percent of its gross proceeds for underwriting and non-underwriting expenses such as legal and accounting fees. The major part of the total direct costs (6.84 percent) is paid to the underwriting syndicate. The mean non-underwriting expenses are equal to 2.43 percent, with accounting and legal fees making up for 65 percent of all non-underwriting expenses. The median IPO incurs costs of 8.96 percent. The median gross spread is exactly 7 percent; in almost 80 percent of all issues the underwriting fee was exactly equal to this figure. The median non-underwriting expenses are lower than the average ones, summing up to 2.00 percent.

Insert Table 1 about here

Table 2 presents descriptive statistics on the pre-SOX (Panel B) and post-SOX (Panel A) periods respectively. Panel C reports the changes in means and medians as well as their statistical significance. Remarkably, almost all variables are statistically significant different between the pre- and post SOX-period. According to our sample, the total direct costs have on average increased by statistically significant but economically rather moderate 33 basispoints to 9.51 percent of gross proceeds.[10] Meanwhile the fees paid to the underwriting syndicate are equal to 7.00 percent in the median both before and after the introduction of SOX. On average, we report a significant reduction in underwriting fees by 12 basispoints. However, as the median IPO has been significantly larger after the introduction of SOX, the findings might be simply driven by scale effects inherent in the gross spread. Mean

[10] Note that all cost items are expressed in percent of gross proceeds.

non-underwriting fees which comprise all other expenses related to the offering have increased by 46 basispoints or about 20 percent; similar holds for the increase in the median. The increase in accounting and legal fees, which are a part of the non-underwriting fees, is even stronger. Here the increase ranges between 51 and 41 basispoints or 35 percent and 37 percent resp., depending on whether one looks at the mean or median. The firm-specific characteristics have changed even more dramatically. While the median (average) gross proceeds have increased by 23.08 percent (+2.95 percent) to $69.39 ($149.95) million, median (average) assets before the IPO more than doubled (+24.11 percent). The median (average) company age has increased by exactly 50 percent (+76.00 percent) from six to nine (21.2) years. The market share of NASDAQ venture capital backed IPOs and High-Technology firms have decreased significantly after the introduction of SOX, which indicates that the composition of the IPO market has been changed substantially by the introduction of SOX. These findings furthermore suggest that the degree of risk inherent in the IPO market has strongly declined in the aftermath of SOX. Apparently, small and rather risky companies tend to refrain from going public.

Insert Table 2 about here

4.2.2 Modelling the direct costs of going public

In order to isolate the impact of SOX on the results reported in the preceding subsection, we set up a linear regression model. From previous literature it is known that gross proceeds are the most powerful determinant of the direct costs of going public.[11] There are several suggestions about the functional form in which proceeds should be used to explain the direct costs. Torstila (2003) uses the natural logarithm of gross proceeds in order to explain scale effects of the offering size on the gross spread.[12] In contrast, Kaserer and Kraft (2003) apply a quadratic cost function on a similar problem in order to capture a fixed-cost effect in the direct cost function.[13] Both approaches focus on the analysis of the gross spread, while in this paper we extend these approaches to the analysis of non-underwriting fees. Thus, in order to identify the most appropriate cost function we initially run simple linear regression models with gross proceeds as the only explanatory variable. Table 3 reports the results of regressions in terms of R2 and F-statistics of different functional specifications. It can be seen that the most powerful specification is the quadratic cost function as proposed by Kaserer and Kraft (2003). Here, however, multicollinearity might come up as an issue. Therefore, we will use PROCEEDS as

[11] Cf. Altinkiliç and Hansen (2001), Kaserer and Kraft (2003), Torstila (2003).
[12] Cf. Torstila (2003), p. 681.
[13] Cf. Kaserer and Kraft (2003), p. 16 n.

an explanatory variable for the underwriter spread, and the inverse of PROCEEDS for all other cost items. According to Table 3 we do not loose much explanatory power by doing so, but we eliminate any multicollinearity issue from our analysis.[14]

Insert Table 3 about here

Furthermore, we include the following control variables. As an additional measure of IPO size we use the assets of the company before the IPO in million dollars and adjusted to purchasing prices of 2000. In line with suggestions in the literature we also use the ratio of primary shares to all shares issued as an additional explanatory variable.[15] In order to see whether risk associated with the offering has an impact on costs, we furthermore integrate the age of the company going public. For the same purpose, we include a dummy variable indicating High-Technology IPOs. We also introduce a dummy variable for the NASDAQ to determine whether the listing venue affects the costs of going public. Furthermore, we employ two additional dummy variables for underwriter reputation and venture-backed IPOs to determine whether IPO stakeholders influence the direct costs of an IPO. Finally, SOX is a dummy variable set to 1 if the IPO has taken place between 2003 and 2007.

Table 4 documents the OLS-estimation results where total direct flotation costs (Panel A), gross spread (Panel B), non-underwriting fees (Panel C) as well as accounting and legal fees (Panel D) are used as the dependent variable. Due to the presence of heteroskedasticity we apply White's (1980) heteroskedasticity-consistent standard errors method for the variance of the least squares estimator and calculate the t-statistics for the coefficients accordingly.[16] It is worth to note that the model has high explanatory power as in all cases the r-squared is between 45 percent and 61 percent.

Insert Table 4 about here

The regression model in Panel A of Table 4 gives the results with respect to total direct costs. As the most important finding in the context of this paper, we note that the SOX-dummy documents a highly significant increase in costs of 89 basis-points. As expected, the inverse of gross proceeds is the most powerful explanatory variable in the model. Assets before the IPO also have a statistically significant negative impact on the direct costs of going public. However, the effect is rather insignificant from an economical point of view and points out only very weak ec-

[14] In fact, all VIF-factors are lower than 5 in our analysis.
[15] Cf. e. g. Altinkiliç and Hansen (2001), Kaserer and Kraft (2003).
[16] By applying a Goldfeld-Quandt test (cf. Greene (2000), p. 509), the null-hypothesis of homoskedasticity had to be rejected at a confidence level of more than 99 percent. For applying that test the sample was split into two sub-samples with the first comprising offerings with less than $50 million and the second comprising offerings with more than $50 million.

onomies of scale. Notably, the age of a company does have a negative impact on the costs of going public. To determine the reason for this effect, we need to look at the components subsequently. NASDAQ IPOs apparently do not face costs different from NYSE IPOs, the same seems to be true for High-Technology firms, for which the regression does not report any effect at all. Apparently, industry background does not have any impact on the direct costs of going public. We may therefore assume that our results regarding the effect of SOX are not driven by a selection bias caused by a change in the mix of IPOs.

The regression model in Panel B of Table 4 describes the underwriting expenses. Here, the SOX-dummy reports a very small negative and statistically insignificant impact of SOX on the gross spread. The coefficients of the dummy variables for the NASDAQ, High-Technology and venture backed firms, and underwriter reputation are statistically significant but economically rather insignificant. Altogether these coefficients may be interpreted as such that risk inherent in the IPO has a minor influence on the gross spread charged by the underwriter. In general, the perception of Hansen (2001) that the 7 percent contract resembles an efficient contract where competition takes place on other means appears to be supported by empirical evidence.

The regression models in Panel C and Panel D of Table 4 describe the non-underwriting expenses and accounting and legal fees, which are part of the non-underwriting expenses. In general, the coefficients of both models are very similar with regards to amplitude and significance. In both models, the SOX-dummy documents a statistically significant positive coefficient of 89 and 80 basispoints respectively. We may therefore conclude that the increase in costs is almost exclusively driven by an increase in accounting and legal fees. The earlier reported impact of company age and ratio of primary shares on the direct costs can as well be traced back to accounting and legal fees. Regarding company age for which we report a negative coefficient, we assume that older companies have a better developed accounting infrastructure and therefore have to pay slightly less accounting and legal fees. Regarding the ratio of primary shares which positively impacts accounting and legal fees, an interpretation is not that obvious. The transition dummy which is set to 1 in 2002, reports a positive coefficient which is significantly lower than the coefficient reported by the SOX-dummy. It may thus be concluded that some, but not all companies going public in 2002 have been compliant to SOX already.

Table 5 reports the regression results for a specific model – we add an additional explanatory variable which captures the interaction between the inverse of gross proceeds and the SOX-Dummy - for the whole and a matched sample. The reason

to employ a matched sample is to rule out that our results are driven by self-selection. If SOX has had a differential impact on the propensity to go public on non-listed firms, for instance depending on size or other firm-specific characteristics, a change in average direct costs might result. In order to address this issue one would have to answer the question what would have been the direct costs of post-SOX IPOs, if they had gone public in the pre-SOX era. Hence, we are in search of counterfactual evidence. It is known from the literature (cf. Caliendo and Kopeinig (2008)) that propensity score matching (PSM) is one method to address this problem. In order to implement this approach we divide the whole sample into a treated (post-SOX IPOs) and an untreated (pre-SOX IPOs) group. For each IPO observation, we calculate a propensity score on the basis of the proceeds raised, assets before the IPO, and company age.[17] After that, each observation in the post-SOX sample is matched with the nearest neighbour within the pre-SOX sample. We allowed pre-SOX IPOs to be a nearest neighbour more than once.

Insert Table 5 about here

The models in Panel A (whole sample) and Panel B (matched sample) of Table 5 use the non-underwriting expenses as dependent variable. The regression results for the matched sample are basically the same as for the whole sample. We can thus rule out that our findings are driven by a selection bias. Furthermore, the reported coefficients are in line with the ones reported for the base model in Table 4. Only the SOX-dummy variable is no longer statistically significant. Meanwhile the interaction term (SOX / IPO Proceeds) reports a statistically significant coefficient of approximately 0.70, respectively 0.61. The impact of SOX on the direct costs therefore is not constant, but strongly size dependent. According to our results, SOX has an impact on fixed non-underwriting costs. Hence, in line with what we have expected, in particular small offerings appear to be affected by the introduction of SOX.

The models in Panel C (whole sample) and Panel D (matched sample) of Table 5 use the accounting and legal fees as dependent variable. The results are basically unchanged. The impact of SOX on accounting and legal fees is again size dependent with small offerings being most affected by the introduction of SOX. Moreover, as the coefficients for the SOX-variables are almost unchanged, it can be deduced, once again, that the cost impact of SOX is almost entirely channelled via its impact on legal and accounting fees. As a difference it should be pointed out that company age no longer has an impact on accounting and legal fees. One explanation of this finding might be that the average age of companies going public has been signifi-

[17] Including firm assets as an additional variable in the PSM does not alter the results. For lack of space we do not report this result in the paper.

cantly higher after the introduction of SOX. Consequently, the results obtained for age in Table 4 might be driven by a change in the composition of the IPO market. Because of the general insignificance of age from an economic point of view and while not being the focus of this paper, we will not look deeper into this question.

As a final robustness test, we modify the regression models tested earlier by substituting the SOX-dummy variable by annual dummy variables for the years from 2003 to 2007. By these means, we are able to determine whether the observed impact is constant over time. This is what one would expect, if SOX has had a structural impact on the costs of going public. We additionally include a year dummy for 2002 as we have seen earlier that a fraction of IPOs going public in 2002 has apparently already been compliant to SOX. The regression results are reported on Table 6.

Insert Table 6 about here

In Panel A, we analyze IPO non-underwriting expenses. The coefficients of the annual dummies are in line with our prediction of a permanent structural break after the introduction of SOX. For all post-SOX years, the coefficients are positive and highly significant. For 2002 and 2003 the coefficients are significant, but lower than in the subsequent years. As SOX was passed on July 25, 2002, it was not applicable to all IPOs having taken place in that year. To some extent this might also be true for some of the IPOs having taken place in 2003 as the IPO process often starts more than a year before the actual IPO. As there has been a transition period during which the implementation of SOX was not mandatory, it may well be that many of the offerings in 2002 and 2003 were not compliant to SOX as well.

The regression analysis of accounting and legal fees in Panel B provides similar results with all annual dummies from 2003 to 2007 being positive and significant.

Finally, by using a simple linear regression model where we explain costs by size, a dummy variable indicating the SOX period, and an interaction term of both variables (SOX / IPO Proceeds), we estimate the impact of SOX on different cost items for different offering sizes. The results are reported in Table 7. For a $20 million offering, the direct costs of going public increase by about 24 percent to 16.1 percent. The increase is caused by accounting and legal fees which almost double to 5.9 percent of gross proceeds. A $100 million offering still faces a total direct costs increase of about 5 percent or 40 basispoints of gross proceeds. For offerings with an issue size beyond $250 million, the impact of SOX on the costs of going public vanishes. Looking at the dollar-impact of SOX, we find that up to an offering sizes of $100 million the additional cost caused by SOX is quite stable and close to $0.5 million. For larger issues, however, the dollar-impact becomes smaller, indicating

that from a pure cost perspective larger IPOs where not significantly affected by SOX. One could conclude that from an auditing point of view SOX brought about that auditing efforts for small offerings adapted to the efforts made already in large offerings, which is further evidence in favour of the notion that SOX has helped to improve information quality and auditing standards in at least a substantial fraction of all IPOs.

Insert Table 7 about here

5. Conclusion

This paper examined the impact of the introduction of SOX on the cost of Going Public. According to ample evidence in the literature, we expected direct costs to significantly increase, mostly due to an increase in accounting and legal fees. We can show that direct flotation costs increase by highly significant 90 basispoints of gross proceeds. This increase is almost entirely due to an increase in accounting and legal fees. Moreover, this increase is to a large extent due to an increase in fixed flotation costs. Therefore, smaller firms are by far more heavily affected than larger firms. In fact, we can show that beyond an offering size of $250 millions there is no SOX-specific impact on direct flotation costs, while up to an offering size of $100 millions the additional cost is relatively stable and equal to 0.5 million year 2000 dollars. It is not surprising, therefore, that accounting and legal fees for a $20 million offering almost double.

We checked the robustness of our findings by applying a matched sample approach. Of course, the change in non-underwriting fees after the introduction of SOX could be due to a different composition of the IPO universe. Therefore, we formed a matched sample by applying a propensity score machting approach. In this way we were able to gather counterfactual evidence in the sense that we can estimate what the flotation cost of a company would have been, if the IPO had been done before the introduction of SOX. Notably, we do not find any evidence that our results are driven by a selection bias.

Our findings have also implications for future research. By affecting the cost of going public it is very likely that SOX has had an impact on information production, even though this impact might be negligible for large firms. In fact, all our results corroborate the presumption that SOX has led to increased efforts of accounting and legal firms. Consequently, we should expect that more or higher quality information is available and exploitable within the IPO process. In this sense, our findings suggest that SOX might have altered the amount and quality of information being available within the IPO process, in particular for small offerings. As IPO pric-

ing is highly related to the degree of publicly available information, our findings therefore suggest that SOX should have had an impact on underpricing as well.

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7. Tables and Figures

	Mean	Std. Dev.	Median
Number of observations		1116	
Total Direct Costs	9.28%	2.18%	8.96%
Gross Spread / Und. Expenses	6.84%	0.58%	7.00%
Non-underwriting expenses	2.44%	1.95%	2.00%
accounting + legal fees	1.55%	1.27%	1.23%
Gross Proceeds (2000 $mil)	147.0	400.7	73.5
Assets before IPO (2000 $mil)	441.1	2067.7	64.4
Ratio of Primary Shares	90.6%	21.3%	100.0%
Age of Company (years)	15.0	22.1	7.0
% NASDAQ		82.1%	
% Venture Capital Backed		55.6%	
% Technology Firms		39.2%	

Table 1: Descriptive statistics, 1998 – 2007.
Notes: Data is collected from Thomson's SDC platinum database. All cost items are expressed in percent of gross proceeds. Both gross proceeds and assets are adjusted to purchasing prices of 2000 and denoted in million dollars. The period before SOX includes IPOs between 1998 and 2002. The period after SOX includes IPOs between 2003 and 2007. Ratio of primary shares denotes the ratio of primary shares to all shares issued. Age of the IPO firm is the difference between the founding and issuing dates, denoted in years. Percent venture capital backed equals the percent of IPOs that were backed by venture capitalists before the IPO. Firms that SDC defines as belonging to a high-tech industry are classified as technology firms.

	Panel A. 2003 - 2007		Panel B. 1998 - 2002		Panel C. change in %			
	Mean	Median	Mean	Median	Mean		Median	
Number of observations	354		762					
Total Direct Costs	9.51%	9.16%	9.18%	8.88%	3.60%	***	3.16%	***
Gross Spread / Und. Expenses	6.76%	7.00%	6.88%	7.00%	-1.87%	***	0.00%	
Non-underwriting expenses	2.75%	2.24%	2.29%	1.89%	20.02%	***	18.77%	***
accounting + legal fees	1.90%	1.54%	1.39%	1.13%	36.94%	***	35.75%	***
Gross Proceeds (2000 $mil)	149.9	85.4	145.7	69.4	2.95%	***	23.08%	***
Assets before IPO (2000 $mil)	508.5	118.2	409.7	51.8	24.11%	***	128.20%	***
Ratio of Primary Shares	84.0%	100.0%	93.7%	100.0%	-10.3%	***	0.0%	
Age of Company (years)	21.2	9.0	12.1	6.0	76.0%	***	50.0%	***
% NASDAQ	70.4%		87.3%		-19.4%			***
% Venture Capital Backed	47.4%		59.5%		-20.4%			***
% Technology Firms	23.8%		46.2%		-48.4%			***

Table 2: Comparison of the pre- and post-SOX periods
Notes: Data is collected from Thomson's SDC platinum database. All cost items are expressed in percent of gross proceeds. Both gross proceeds and assets are adjusted to purchasing prices of 2000 and denoted in million dollars. The period before SOX includes IPOs between 1998 and 2002. The period after SOX includes IPOs between 2003 and 2007. Ratio of primary shares denotes the ratio of primary shares to all shares emitted. Age of the IPO firm is the difference between the founding and issuing dates, denoted in years. Percent

venture capital backed equals the percent of IPOs that were backed by venture capitalists before the IPO. Firms that SDC defines as belonging to a high-tech industry are classified as technology firms. A two sample Gauss test is used here to examine whether the mean results are statistically significant different from each other. The difference of medians is tested by using the Mann-Whitney test.

	PROCEEDS	1 / PROCEEDS	LN(PROCEEDS)	r-squared	F-statistic
Total direct costs	x			14.0%	15.2
		x		54.3%	283.2
			x	36.4%	287.0
	x	x		**57.3%**	**175.0**
Gross spread	x			42.4%	24.8
		x		14.8%	104.7
			x	36.9%	151.3
	x	x		**46.6%**	**71.6**
Non-underwriting expenses	x			5.0%	10.5
		x		50.5%	244.4
			x	24.3%	190.5
	x	x		**50.5%**	**494.1**
Accounting and legal fees	x			4.8%	10.6
		x		36.1%	185.3
			x	20.4%	203.6
	x	x		**36.4%**	**157.9**

Table 3: Choosing a functional form of gross proceeds explaining the direct costs and its components

Notes: Data is collected from Thomson's SDC platinum database. PROCEEDS represent the gross proceeds which are adjusted to the purchasing prices of 2000 and denoted in million dollars. The results base on estimates of a simple linear regression with the direct costs or a cost component as the dependent variable. All costs are expressed in percent of gross proceeds. The regression model includes a constant and the independent variable PROCEEDS in a functional form as indicated on the table. The F-statistic is based on standard errors corrected by White's (1980) method in order to correct for heteroskedasticity.

	Panel A. Total Direct Costs	**Panel B.** Underwriting expenses	**Panel C.** Non-underwriting expenses	**Panel D.** Accounting and Legal fees
Intercept	0.065 ***	0.067 ***	0.001	0.001
	19.8	*50.5*	*0.3*	*0.2*
IPO Proceeds		-8.8E-06 ***		
		-4.2		
1 / (IPO Proceeds)	1.274 ***		1.180 ***	0.647 ***
	14.0		*14.4*	*12.6*
Assets before IPO	-1.5E-06 ***	2.1E-07	-1.9E-07	-1.7E-07
	-3.6	*0.4*	*-1.5*	*-1.5*
LN(AGE)	-0.001 **	-2.3E-04	-0.001 *	-0.001 **
	-2.1	*-1.3*	*-1.8*	*-2.2*
Ratio of Primary Shares	0.009 ***	0.001	0.007 ***	0.005 ***
	4.3	*0.5*	*4.7*	*4.5*
NASDAQ (dummy)	2.4E-04	0.003 ***	-0.002 *	0.000
	0.2	*5.6*	*-1.9*	*-0.2*
Technology firm (dummy)	0.000	4.4E-04 **	0.000	0.000
	0.0	*2.0*	*-0.5*	*-0.3*
Venture-backing (dummy)	-0.002	0.001 **	-0.002 **	-0.001 *
	-1.6	*2.1*	*-2.2*	*-1.8*
Underwriter rank (dummy)	0.001	-0.001 ***	0.001	0.001
	0.9	*-3.1*	*1.0*	*0.8*
Transition-year (dummy)	0.007 ***	0.002 ***	0.005 ***	0.004 ***
	4.2	*3.5*	*3.2*	*3.4*
SOX (dummy)	0.009 ***	-3.4E-04	0.009 ***	0.008 ***
	8.7	*-1.0*	*9.1*	*11.5*
F-statistic	53.5	24.3	46.6	40.2
r-squared	0.605	0.495	0.560	0.454
Number of observations	1116	1116	1116	1116

Table 4: Basic regression analysis of price adjustments and underpricing

Notes: Data is collected from Thomson's SDC platinum database. The sample consists of 1,116 firms that went public between 1998 and 2007. IPO proceeds equal the amount of money raised in the IPO (excl. greenshoe), in year 2000 million dollars. Assets before the IPO equal the total assets of the firm before the IPO, in year 2000 million dollars. Age of the IPO firm is the difference between the founding and issuing dates, denoted in years. Ratio of primary shares denotes the ratio of primary shares to all shares issued. NASDAQ is a dummy variable indicating IPOs that went public on the NASDAQ stock exchange. Firms that SDC defines as belonging to a high-technology industry are classified as technology firms. Underwriter rank is a measure of the quality of the underwriter, with the minimum rank being zero and the maximum being nine, according to Loughran and Ritter's updated measures of the Carter and Manaster rankings. Transition-year is a dummy variable set to 1 in case of the IPO taking place in 2002. SOX is a dummy variable set to 1 in case of the IPO taking place after 2002. White heteroskedasticity robust t-statistics are shown in italic. ***, **, * denote significance at the 1, 5, and 10% level.

	Panel A. Non-underwriting expenses	**Panel B.** Non-underwriting exp. (matched)	**Panel C.** Accounting and Legal fees	**Panel D.** Acc. and Legal fees (matched)
Intercept	0.006 **	0.005 **	0.003	0.001
	2.1	*2.3*	*0.9*	*0.6*
1 / (IPO Proceeds)	1.017 ***	0.505 ***	0.944 ***	0.482 ***
	11.6	*14.0*	*13.7*	*11.4*
Assets before IPO	0.000 **	0.000 **	0.000 **	0.000 **
	-2.2	*-2.2*	*-2.3*	*-2.4*
LN(AGE)	-0.001 *	-0.001 **	3.5E-04	1.1E-04
	-1.7	*-2.1*	*0.6*	*0.3*
Ratio of Primary Shares	0.005 ***	0.004 ***	0.005 ***	0.003 ***
	3.9	*3.6*	*3.3*	*2.8*
NASDAQ (dummy)	-0.004 ***	-0.002	-0.004 ***	-0.001
	-3.0	*-1.6*	*-2.7*	*-0.9*
Technology firm (dummy)	0.000	0.000	0.001	0.001
	0.4	*0.8*	*0.9*	*1.8*
Venture-backing (dummy)	-0.003 ***	-0.002 ***	-0.002	-0.001
	-3.2	*-2.9*	*-1.4*	*-1.1*
Underwriter rank (dummy)	0.002	0.001	0.003 **	0.002 **
	1.6	*1.4*	*2.3*	*2.2*
Transition-year (dummy)	0.004 **	0.002 **	0.003	0.002
	2.3	*2.1*	*1.3*	*1.6*
SOX (dummy)	-0.002	-0.001	-0.004	-0.002
	-0.9	*-1.0*	*-1.9*	*-1.4*
SOX (dummy) / (IPO Proceeds)	0.704 ***	0.614 ***	0.795 ***	0.643 ***
	4.1	*5.4*	*4.8*	*5.7*
F-statistic	49.0	51.1	56.4	53.1
r-squared	0.596	0.637	0.518	0.576
Number of observations	1116	1116	1116	1116

Table 5: Basic and matched sample regression analysis of total direct costs

Notes: Data is collected from Thomson's SDC platinum database. The sample consists of 1,116 firms that went public between 1998 and 2007. The matched sample consists of 722 IPOs over the same time period. IPO proceeds equal the amount of money raised in the IPO (excl. greenshoe), in year 2000 million dollars. Assets before the IPO equal the total assets of the firm before the IPO, in year 2000 million dollars. Age of the IPO firm is the difference between the founding and issuing dates, denoted in years. Ratio of primary shares denotes the ratio of primary shares to all shares issued. NASDAQ is a dummy variable indicating IPOs that went public on the NASDAQ stock exchange. Firms that SDC defines as belonging to a high-technology industry are classified as technology firms. Underwriter rank is a measure of the quality of the underwriter, with the minimum rank being zero and the maximum being nine, according to Loughran and Ritter's updated measures of the Carter and Manaster rankings. Transition-year is a dummy variable set to 1 in case of the IPO taking place in 2002. SOX is a dummy variable set to 1 in case of the IPO taking place after 2002. White heteroskedasticity robust t-statistics are shown in italic. ***, **, * denote significance at the 1, 5, and 10% level.

	Panel A. Underwriting expenses	**Panel B.** Accounting and legal fees
Intercept	0.001	0.001
	0.4	*0.3*
1 / (IPO Proceeds)	1.175 ***	0.643 ***
	14.3	*12.6*
Assets before IPO	0.000	0.000
	-1.5	*-1.5*
LN(AGE)	-0.001 *	-0.001 **
	-1.7	*-2.0*
Ratio of Primary Shares	0.007 ***	0.005 ***
	4.4	*4.2*
NASDAQ (dummy)	-0.002 *	0.000
	-1.7	*0.0*
Technology firm (dummy)	-0.001	0.000
	-0.6	*-0.5*
Venture-backing (dummy)	-0.002 **	-0.001 *
	-2.1	*-1.8*
Underwriter rank (dummy)	0.001	0.001
	0.9	*0.6*
Y2002 (dummy)	0.005 ***	0.004 ***
	3.2	*3.3*
Y2003 (dummy)	0.004 ***	0.004 ***
	3.2	*4.4*
Y2004 (dummy)	0.009 ***	0.008 ***
	6.1	*7.7*
Y2005 (dummy)	0.010 ***	0.009 ***
	4.3	*5.8*
Y2006 (dummy)	0.008 ***	0.007 ***
	5.9	*6.3*
Y2007 (dummy)	0.011 ***	0.010 ***
	5.9	*6.9*
F-statistic	34.4	29.5
r-squared	0.563	0.459
Number of observations	1116	1116

Table 6: Regression Analysis

Notes: Data is collected from Thomson's SDC platinum database. The sample consists of 1,116 firms that went public between 1998 and 2007. IPO proceeds equal the amount of money raised in the IPO (excl. greenshoe), in year 2000 million dollars. Assets before the IPO equal the total assets of the firm before the IPO, in year 2000 million dollars. Age of the IPO firm is the difference between the founding and issuing dates, denoted in years. Ratio of primary shares denotes the ratio of primary shares to all shares issued. NASDAQ is a dummy variable indicating IPOs that went public on the NASDAQ stock exchange. Firms that SDC defines as belonging to a high-technology industry are classified as technology firms. Underwriter rank is a measure of the quality of the underwriter, with the minimum rank being zero and the maximum being nine, according to Loughran and Ritter's updated measures of the Carter and Manaster rankings. The year variables 2002. 2003, 2004, 2005, 2006, and 2007 are dummy variables set to 1 in the respective year. White heteroskedasticity robust t-statistics are shown in italic. ***, **, * denote significance at the 1, 5, and 10% level.

Gross proceeds in million dollar	20	50	100	250
Total Direct Costs				
before SOX	13.0%	9.5%	8.4%	7.7%
after SOX	16.1%	10.6%	8.8%	7.7%
change in %	24.3%	11.8%	5.3%	0.5%
change in million $	0.6	0.6	0.4	0.1
Non-Underwriting Expenses				
before SOX	5.5%	2.6%	1.6%	1.0%
after SOX	8.6%	3.7%	2.1%	1.1%
change in %	55.2%	44.8%	32.7%	14.1%
change in million $	0.6	0.6	0.5	0.4
Accounting & Legal fees				
before SOX	3.0%	1.5%	1.0%	0.7%
after SOX	5.9%	2.6%	1.5%	0.8%
change in %	94.3%	69.2%	44.6%	13.9%
change in million $	0.6	0.5	0.5	0.3

Table 7: Cost estimates based on linear regression results

Notes: The estimates are based on data from Thomson's SDC platinum database. The estimates are calculated on the basis of results obtained via a simple linear regression model where costs are explained by size, a dummy variable indicating the SOX period, and an interaction term of both variables (SOX / IPO Proceeds). All costs are expressed in percent of gross proceeds.