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THE COST OF RAISING CAPITAL – NEW EVIDENCE FROM SEASONED EQUITY OFFERINGS IN SWITZERLAND

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1. Introduction

Finance academics have long debated the issue of optimal capital structure. A lot of theoretical and empirical effort has gone into trying to understand the costs of different sources of capital. For some reason, however, the costs of transacting these securities have been rather neglected. This is particularly true for the direct flotation costs, i.e. underwriting fees and other costs that firm incur when issuing securities. In comparison, more attention has been dedicated to the assessment of the indirect flotation costs, namely the adverse market reaction observed when firms decide to issue securities.

This paper deals with direct flotation costs only.[1] It presents new evidence with respect to the structure of flotation costs incurred by companies listed on the Swiss Stock Exchange (SWX) when offering seasoned shares. In this regard it extends a particular strand of the corporate finance literature dealing with the structure of direct flotation cost. It has been conventional wisdom over the last decades that flotation costs exhibit economies of scale, i.e. the average cost of an issue should be the lower the higher gross proceeds are. ALTINKILIÇ/HANSEN (2000) challenged this idea for the first time by presenting evidence in favor of increasing marginal flotation costs, at least beyond some critical point. By analyzing a German SEOs sample BÜHNER/KASERER (2002) find also no clear support for the economies of scale view, although they were able to show that flotation costs have a significant fixed cost component.

This paper extends the analysis of BÜHNER/KASERER (2002) to a Swiss sample of SEOs. The contribution to the literature is threefold. First, the institutional environment in Switzerland is not too much different from Germany. Therefore, for generalizing the results presented in BÜHNER/KASERER (2002) it will be interesting to see whether their results will also hold for the Swiss capital market. Second, given this institutional resemblance, and taking into consideration the fact that the capital markets of both countries are highly integrated, one would expect a rather similar flotation cost structure. It is interesting in

this regard that we find the level of flotation costs to be perceivably higher in Switzerland than in Germany. It cannot be ruled out that this is due to some kind of oligopolistic rents earned by Swiss banks. Third, we will for the first time present a flotation cost structure for Swiss firms. This may be of interest for corporate finance practitioners in Switzerland.

In order to achieve these goals our investigation focuses on answering the following two questions. First, how can the flotation cost function be calibrated under the economies of scale-view in order to capture the impact of a set of economically relevant variables? Second, does an estimation of this function on the basis of our data set corroborate the view that issues are cheaper the larger gross proceeds are? By examining 74 SEOs arranged by Swiss companies over the years 1996 to 2003 we are able to present the following results. First, average direct flotation costs equal 4.53 percent of gross proceeds. This figure is surprisingly high when compared with results related to Germany or France. Second, we find several economically reasonable variables to have a significant impact on flotation costs. This evidence is against recently expressed presumptions that average flotation costs may be clustered. Third, we find strong support against economies of scale in the sense that, other things equal, average flotation costs are rather increasing than decreasing in gross proceeds.

The article proceeds as follows. Section 2 describes the institutional background for firms floating shares on the Swiss capital market. Section 3 gives a brief review of the literature and pertinent results. Section 4 reports sample characteristics, while section 5 develops and analyzes the direct flotation cost structure on the Swiss capital market.

2. The Swiss Institutional Framework

According to the Swiss Stock Exchange Act (*Börsen- und Effektenhandelsgesetz*) the SWX regulates the admission of securities to be listed. For that purpose the SWX has released its Listing Rules (*Kotierungsreglement*) in 1996. Together with rules set up by the Swiss Code of Obligationes (*Obligationenrecht*) this defines the legal framework for share issues in Switzerland. Without going into details it should be pointed out that an issuer applying for a listing has to file a registration statement. The most important part of this statement is the listing prospectus which contains material information regarding the issuing company and the securities being offered.[2] For our purposes the most important information refers to the price and number of issued stocks, offering method and, if necessary, specification of the preemptive rights, net offering proceeds and disclosure of main shareholders. Basically, these requirements apply to equity offerings regardless whether the company makes an IPO or a SEO. However, companies offering seasoned equity shares can be waived from the obligation to provide a listing prospectus, if the shares stem from a capital increase with a par value less than 10 percent of the par value of outstanding shares, if the issue value is less than 10 percent of the firm's market capitalization, or if a listing prospectus containing all the information necessary for an equity issue has been published not more than three months before the current listing application has been made. Due to this exception we do not have a listing prospectus for all SEOs registered on the SWX.

In practice, almost all SEOs by non-bank companies in Switzerland are underwritten by an investment bank. In this case the syndicate lead by the lead managing bank guarantees the placement of all the stocks to be offered. Moreover, the lead manager acts as a guarantor of the listing prospectus and, therefore, bears a liability for any material misrepresentation or omission in the prospectus. As far as the offering method is concerned, it turns out that in practice most offerings are arranged via an underwritten rights offering, while some large issues are also set up as an underwritten cash of-

fering.[3] Within a rights offering old shareholders have preemptive rights allowing them to buy the new shares on a preferential basis. Contrary, within a cash offering shares are offered to the market without making any difference between old and new shareholders. Usually, in both methods the underwriting syndicate bears the placement risk. However, this risk may be very different depending on the underwriting arrangement. It is higher, for instance, for rights offers with a small offering price discount than for rights offers with a high offering price discount. Occasionally, large existing shareholders make a take-up commitment, i.e. they comply to subscribe a given number of the shares being offered. This, of course, lowers the placement risk for the underwriter.[4]

The issuing firm has to pay an underwriting fee to the lead underwriter as well as to the other members of the underwriting syndicate for the services being offered. In order to understand the economic nature of this fee it should be noted that the underwriter has at least three important tasks within a public placement. First of all, there is a certification function due to the reputational risk incurred. Second, the lead underwriter has an advisory function. He is not only deeply involved in working out the whole registration statement, but he regularly is even engaged as an advisor in other corporate finance matters of the company. Third, he is responsible for managing the whole placement process. Evidently, a fee is charged for offering these services. A part of this underwriting fee is allocated to the members of the underwriting syndicate according to the underwritten quotes. The remaining part goes to the lead manager as a compensation for the services provided beyond the mere placement efforts. On top of the underwriting fees the issuer incurs other flotation costs like fees paid to the stock exchange, fees for services offered by law and auditing firms, advertising costs, etc. Total direct flotation costs are made up of underwriting fees and these other flotation costs.

With respect to the economic structure of these flotation costs it should be noted that they may have a variable as well as a fixed part. The variable part is related to issue size, while the fixed part is not. Of course, this cannot directly be observed. Therefore, a cross-sectional flotation cost analysis is needed in order to infer to what extend flotation costs are variable. Now, in order to have economies of scale average flotation costs should be ever decreasing in issue size. This can either be due to a consistent fixed cost incurred by the underwriter when arranging an equity offering, or it may be due to decreasing marginal flotation costs. Both assumptions, however, seem to be rather doubtful from an economic point of view. It may be, of course, that some flotation cost components, like auditing fees or information efforts undertaken by the underwriter, are fixed within some issue size brackets. However, even these costs may vary when issue size is consistently increased. Accordingly, it can be argued that marginal flotation costs increase, at least beyond some critical issue size. For instance, for larger issues the effort for reaching new investors may become increasingly expensive. Moreover, the larger the relative issue size, the larger the adverse selection costs of equity financing are assumed to be. Hence, by certifying a relatively large issue the lead underwriter may incur a high risk. Hence, from an economic point of view average flotation costs are not expected to be ever decreasing. If at all, they should decrease only up to a critical issue size and increase thereafter; i.e. they are expected to be U-shaped.[5]

3. A Brief Review of the Literature

Here we are going to present the most important results with respect to direct flotation costs. The following issues are discussed: First, some numbers with respect to average flotation costs in different countries are reported. Second, the impact of the flotation method on flotation costs is dis-

cussed. Third, the evidence with respect to the existence of economies of scale is presented. Fourth, the impact of some other economically important variables, like stock riskiness and offer price discount, is discussed. Finally, the discussion with respect to the question whether the findings on flotation costs may be a result of oligopolistic underwriting markets is resumed.

3.1 Results on Average Flotation Costs

SMITH (1977) reported flotation costs of 6.17 percent for underwritten cash offers in the US, 6.05 percent for underwritten rights issues, and 2.45 percent for uninsured rights offers. ECKBO/MASULIS (1992) presented slightly different figures for industrial firms in the US. According to their study total direct flotation costs equal 6.09 percent for underwritten cash offerings, while they amount only to 4.03 percent for underwritten rights offerings. LEE/LOCHHEAD/RITTER (1996) find direct flotation costs in the US to average 7.11 percent. According to BÜHNER/KASERER (2002) direct flotation costs for underwritten rights offerings of industrial firms in Germany amount to 1.65 percent. For underwritten cash offers total costs are significantly higher at 4.61 percent. In UK total direct flotation costs average to 5.78 percent according to ARMITAGE (2000), while the average cost for Norwegian industrial firms is 4.4 percent according to BØHREN/ECKBO/MICHALSEN (1997). Both papers analyze only rights offers. Finally, GAJEWSKI/GINGLINGER (2002) report average flotation costs of 2.07 percent for listed companies in France. If the placement is arranged as a cash offering these costs increase to 2.89 percent.[6] Of course, one might argue that European- and US-based results cannot be compared due to the fact that rights issues are still common in Europe, while US firms stick to the more expensive underwritten cash offering. In fact, there is a lot of empirical evidence in favor of the assertion that the offering method has a strong impact on flotation costs. Hence, one should be careful as to what figures are compared.

3.2 The impact of the Flotation Method

93 percent of firms in the sample of SMITH (1977) opted for a SEO based on either underwritten cash offerings or standby rights offerings, which are more expensive than uninsured rights offerings. This leads him to the conclusion that there is an *equity financing paradox*. This assertion holds because the market risk of an uninsured rights offering can almost be eliminated by offering the seasoned shares at a sufficient discount without any wealth expropriation for shareholders.[7] The impact of the offering method on flotation costs was confirmed by ECKBO/MASULIS (1992), p. 305 n., and BÜHNER/KASERER (2002). They found underwritten cash offerings to be 2 resp. 2.5 percent (of gross proceeds) higher than underwritten rights offerings. Moreover, ECKBO/MASULIS (1992), p. 305 n., found that flotation costs for uninsured rights offerings are significantly lower than for standby rights offerings.

3.3 Evidence with Respect to Economies of Scale

SMITH (1977) also documented economies of scale as seemingly evidenced in many following studies.[8] Diminishing marginal flotation costs have also been confirmed by ARMITAGE (2000) for the UK market and GAJEWSKI/GINGLINGER (2002) for France. However, the evidence with respect to economics of scale is less pronounced as these papers may suggest. In fact, ALTINKILIÇ/HANSEN (2000) argue that the empirical evidence of decreasing flotation costs is misleading. Their point is that the underwriting fees are cheaper for larger firms not because they

have larger issues but because larger firms tend to be of higher quality. From this perspective it could be that the alleged *larger is cheaper*-rule is, in fact, a *larger is higher quality*-rule. Actually, by estimating an appropriately designed flotation cost function ALTINKILIÇ/HANSEN (2000) showed that the average underwriting spread is U-shaped in issue size. Hence, the marginal spread is rising, at least beyond some critical point. Mixed evidence with respect to economics of scale in underwriting fees has been presented by BÜHNER/KASERER (2002) and KASERER/KRAFT (2003) in the context of German SEOs resp. IPOs.

3.4 Results on the Impact of Other Variables

As far as other structural issues of direct flotation costs are concerned the following should be pointed out: ECKBO/MASULIS (1992) show that direct flotation costs are increasing in the degree to which a firm is widely held. Similar evidence has been provided by BÜHNER/KASERER (2002) for Germany, by ARMITAGE (2000) for UK, and by GAJEWSKI/GINGLINGER (2002) for France. Moreover, these studies reveal direct flotation costs to be an increasing function of stock price volatility.[9] BÜHNER/KASERER (2002) are using an approach where they try to estimate to what extend flotation costs are fixed and to what extend they are variable, i.e. they depend on gross proceeds. In this context they can show that volatility has only an impact on fixed flotation costs but not on variable costs. This is what one would expect, given that volatility can be regarded as a proxy for information costs, which by nature are fixed.

As far as rights issues are concerned it has been reported in the literature that an increase in the offer price discount seems to have a positive impact on flotation costs. This is surprising, because at a first glance one would expect the risk position of an underwriter to be more comfortable the higher the offer price discount is. BØHREN/ECKBO/MICHALSEN (1997), p. 247, argue that firms may use the offer price discount to signal their quality, with higher quality firms setting lower discounts. In this sense, the offer price discount is a proxy for firm quality or firm risk. Interestingly, ARMITAGE (2000) reports a significant impact of the offer price discount on the non-underwriting issue costs, but a completely insignificant impact on underwriting fees. BÜHNER/KASERER (2002) find the offer price discount to have a U-shaped impact on flotation costs. This aligns the idea that lowering the offer price has a negative impact on flotation costs due to less placement risk for the underwriter with the idea that the offer price can also be regarded as a signal.

3.5 Flotation Costs and Competition

Finally, MARSH (1980, 1994) approaches the question whether underwriting fees are compatible with the presumption of a competitive market for investment banking services. He estimated the excess returns gained by sub-underwriters of rights issues by pricing their risk position according to the Black/Scholes-formula. The excess returns were found to be about 0.7 to 1.3 percentage points. Although a part of this excess returns may be required to compensate sub-underwriters for the costs incurred in related services, MARSH regarded sub-underwriting as a very profitable activity. Actually, underwriting fees have been the subject of an antitrust investigation in UK. BAE/LEVY (1990), by analyzing underwriting fees for firm commitment offers in the U.S. using a similar approach as in MARSH (1980), found average excess returns to be between 3.64 and 0.14 percentage points. However, due to the various services provided by underwriters they do not interpret their results as evidence against the competitive market hypothesis. GALLOWAY (1994) found significant excess returns for

AMEX- and NASDAQ-SEOs, but not for NYSE-offerings. Evidence against the competitive underwriter market hypothesis was found by MacCULLOCH/EMANUEL (1994) for New Zealand rights issues, by HANDLEY (1995) for Australian rights issues and by KUNIMURA/IIHARA (1985) for Japanese firm commitment offerings. US-related evidence was recently reported by CHEN/RITTER (2000) in the context of IPO spreads, as they found them to be clustered according to the so called *seven percent rule*. In fact, fixed underwriting spreads are currently the subject of an investigation of the US Department of Justice.[10] TORSTILA (2001) found clustering to some extend also for European IPO-spreads. Although it will be shown in this paper that flotation cost spreads for Swiss SEOs are not affected by clustering, one striking result will probably fit into the picture of lacking market competitiveness. In fact, we find spreads in Switzerland to be perceivably higher than in other Continental European countries, especially compared with Germany. As capital markets in both countries have a rather similar institutional background it cannot be ruled out that this result uncovers oligopolistic rents earned by Swiss investment banks.

4. The Sample

In order to gather empirical evidence on direct flotation costs on the Swiss capital market we recorded all public SEOs by listed Swiss companies carried out over the years 1996 to 2003 on the main market segment of the SWX. As the disclosure of flotation costs has not been prescribed before the Listing Rules were released in 1996, no pertinent information is available for the years before 1996. Moreover, as already mentioned, issuers can be waived from the obligation to provide a listing prospectus and, hence, from disclosing net offering proceeds. Indeed, several issues without a listing prospectus were found. For all these reasons we ended up with a sample of 74 SEOs. Listing prospectuses of all these issues were placed at our disposal by the admission board of the SWX. Stock market related information has been provided by Reuters Data. Table 1 gives an overview of our sample.

Table 1: Sample Description
Period: 1996–2003

Variable		Total Sample	Underwritten Cash Offerings	Underwritten Rights Offerings		
				Banks	Non-Banks	All
Observations		74	10	12	52	64
Total Cost Spread	Average	4.53	5.65	2.92	4.71	4.37
(in percent)	Median	4.26	5.52	2.66	4.65	4.25
Gross Proceeds	Average	309.22	162.43	112.86	388.32	335.85
(in million CHF)	Median	84.75	89.33	44.79	85.50	74.37
Equity Increase	Average	49.75	20.57	39.92	56.80	53.58
(in percent)	Median	27.73	20.66	35.28	29.67	30.36
Free Float	Average	63.96	66.03	35.53	69.53	63.06
(in percent)	Median	69.45	73.20	26.70	71.00	69.40
Offer Price Discount	Average	13.33	10.93	13.38	14.13	13.98
(in percent)	Median	8.55	5.98	10.92	7.83	8.90
Beta	Average	0.47	0.79	0.06	0.51	0.42
(250 days)	Median	0.33	0.65	0.04	0.41	0.28
Performance	Average	34.25	57.84	16.87	34.06	30.73
(250 days)	Median	15.98	32.72	10.86	19.34	15.31

As one can see, flotation costs average 4.53 percent of gross proceeds; the median is equal to 4.26 percent. As reported above, this figure is lower than the spreads calculated for US-firms, but perceivably higher than those for other Continental European countries. This is still true, even if only underwritten rights offerings are taken into account. In accordance with all other studies we find cash offerings to have higher flotation costs than rights offerings with a spread difference of about 1.3 percentage points. As expected, also on the Swiss capital market offerings have lower flotation costs, if the issuer is a bank. It should be noted here that 8 of the 12 banks making a rights offering are banks controlled by a Swiss canton. It can be assumed that the government of the canton has given a take-up commitment in order to maintain its role as a leading shareholder. This may be an additional reason why bank issues are cheaper than non-bank issues.

The average issue size equals CHF309m and is lower for cash offerings than for rights offerings. Sample firms increase their share capital on average by 50 percent. This figure is rather high and caused by two firms which increase their share capital within a single offering by 800 resp. 400 percent. By looking at the median one can see that the increase of the share capital is 28 percent, which may be a reasonable figure especially when taking into account that we could not record small issues. The free float is on average about 64 percent, which is a rather high figure especially when compared with Germany or France. What seems to be puzzling is the offer price discount. It averages to 13 percent. However, the difference between the offer price discount of rights offerings and cash offerings is only about 3 percentage points and, hence, very small. This is in contrast to the finding that average flotation costs differ consistently depending on the offering method. Moreover, as old shareholders do not have preemptive rights within a cash offering the question may be raised, whether an average discount of about 11 percent is in accordance with shareholder protection.

Table 2 gives an indication how flotation costs and other variables vary across five issue size brackets. What is interesting at a first glance, and different to several other studies presented in the literature, is that even within this simple descriptive analysis we do not find evidence in favor of economics of scale. In fact, the total cost spread increases in issue size. However, more evidence will be gathered within the multiple regression analysis presented below. Nevertheless, it is very interesting to see that issues smaller than CHF25m have flotation cost of 4 percent, while issues larger than CHF200m have flotation costs of more than 5 percent.

Finally, a look on table 3 gives an impression how the lead management is allocated to the different investment banks active in the underwriting business. As one can see, five banks control a large fraction of the market. Even more interesting is the fact that in 15 cases issuer opted for self-registration. In these cases the issue was managed

Table 2: Mean Flotation Costs of Swiss SEOsby Issue Size
Period: 1996–2003

Gross Proceeds (in million CHF)	N	Total Cost (in percent)	Offer price discount (in percent)	Free float (in percent)	Beta
0 to 25	13	3.99	11.27	52.64	0.28
25 to 50	10	4.07	17.88	60.37	0.29
50 to 100	20	4.48	10.90	76.72	0.41
100 to 200	13	4.71	16.29	66.68	0.53
200 +	18	5.11	12.69	57.98	0.72

Table 3:
Lead Managing Investment Banks in our Sample
Period: 1996–2003

Name	Number of Leads
CSFB	16
UBS Warburg	12
ABN Amro	6
Julius Bär	6
Vontobel	5
other	14
Self-Registration	15
- incl. Cantonal Banks	8

without engaging a lead underwriter. As one may presume, this offer method was chosen by banks. However, a small number of non financial firms also decided to issue their seasoned shares without relying on the services of a lead underwriter.

5. Empirical Analysis of Flotation Costs

In order to detect the direct flotation cost structure on the Swiss capital market we use the model introduced by BÜHNER/KASERER (2002). As a simple starting point, the cost function is assumed to be one-dimensional. It is assumed that total costs (C), denominated in CHF, can be modeled as a quadratic function of gross proceeds (GP). In this way increasing, constant, or diminishing marginal costs can be captured. Thus, total costs are defined as:

$$C = \beta_0 GP + \beta_1 GP^2 + \beta_2 \qquad (1)$$

As one can see, the parameter β_2 represents fixed costs, while the parameter β_1 captures the curvature of the marginal cost function. Considering that $\partial^2 C/\partial GP^2 = 2\beta_1$ holds, marginal flotation costs are diminishing (increasing) in gross proceeds whenever the condition $\beta_1 < 0$ ($\beta_1 > 0$) holds. Finally, the parameter β_0 characterizes the location of the marginal cost function in that it gives us the marginal cost at the point GP = 0.

Of course, we will control for other firm- or issue specific variables by integrating the allegedly relevant variables into our total cost function. If our model specification is accurate enough we should be able, as a consequence, to detect marginal cost behavior, holding firm characteristics constant, in a more general way.[11] Before we present the final approach, it is important to note that in order to avoid heteroskedasticity problems average costs should be used as dependent variable instead of money denominated costs. Hence, total cost function (1) is rearranged by considering that average flotation costs are defined as c = C/GP. In this way we get the following average flotation cost function:

$$c = \beta_0 + \beta_1 GP + \frac{\beta_2}{GP} \qquad (2)$$

As discussed before, several other variables, especially those related to the issuer, will also have an impact on flotation costs. First of all, according to results presented in the literature it can be assumed that the larger the free float of a company is, the higher the flotation costs are. This relates to the fact that the take-up level, i.e. the proportion of offered shares which are subscribed by existing shareholders, is negatively correlated with the extent of freely floating shares.[12] As has already been pointed out we were not able to collect reliable data on take-up commitments incurred by existing shareholders. Therefore, free float is used as an inverse proxy for unknown take-up commitments. Moreover, it should be noted that the ex ante probability to realize a given take-up by existing shareholders depends on the shareholder structure even if no formal take-up commitments exist. Hence, the free float variable will capture an influence on placement efforts and risk which goes beyond the influence captured solely by a take-up variable. This is the reason why flotation costs are supposed to be the higher the higher the free float of a company is.

Second, it has been pointed out in the literature that flotation costs are lower, if the issuer is a financial institution. One major reason may be that such companies normally do not engage an underwriter for arranging the SEO. As opportunity costs, e.g. time and money spent by the CFO for the purpose of selling newly offered shares, are not reported in the listing prospectus, lower flotation costs of self-registered offerings are due to a reporting bias, at least to a large extent. In our Swiss sample we found that even some non financial companies arranged a SEO without engaging an investment bank. We call this subsample of companies the self-registration sample. Hence, we introduce a dummy variable *SR*, which is set to one, if the issuer belongs to the self-registration subsample and zero otherwise.

Third, we suppose the offer price discount to have a significant impact on underwriting fees. However, as discussed before, empirical evidence in this regard is rather mixed or points even in the wrong direction. Basically, we expect the offer price discount to have a positive as well as a negative impact on flotation costs due to the following reasoning. At the one side, it is obvious that the risk of the underwriter will be lowered the larger the offer price discount is. Hence, the risk component of the underwriting fees should become smaller as the offer price becomes smaller. At the other side, it is known that the offer price can be used as an instrument to signal the quality of a firm.[13] High offering prices would be used more often by high quality firms, which are paying lower underwriting fees due to the smaller risk component. Hence, it can easily be seen that depending on the relative impact of these two effects the offer price discount could have a U-shaped impact on underwriting fees. We define the offer price discount *OPD* as the difference between the stock price and the offer price divided by the stock price.[14]

Fourth, the complexity of an issue could have an impact on flotation costs. A similar result has been found in the context of IPOs by KASERER/KRAFT (2003). We define an issue to have above average complexity, if it is arranged via an international offering, the offering is a direct consequence of a merger, different share classes are issued within one offering, or the offering is accompanied by a stock split or by a restructuring of outstanding share classes. In all these cases the dummy variable *CMPX* is set equal one and zero otherwise.

Finally, stock price riskiness may have an impact on flotation costs. This is because stock price volatility influences the placement risk borne by the underwriter. Moreover, it might be a proxy for firm quality in the sense that this variable captures the influence of information asymmetry. It should be noted, however, that depending on the hedging activities incurred by the underwriter it may be that she cares more about market risk than about stand-alone risk, i.e. market risk plus firm-specific risk. Especially from the viewpoint of an underwriter managing several issues simultaneously the issuer's market risk may be of special interest, at least as long as we suppose that she doesn't engage in sufficient hedging activities. Therefore, we will use both market risk and stand-alone risk as risk measures in our regression analysis.

Among the variables used in the literature those discussed hitherto are definitely the most important ones. Therefore, we stick to these variables also in this paper. However, there is one variable that according to the literature has a strong impact on flotation costs that will not be integrated in our regression analysis. This is a dummy variable reflecting whether the offering is arranged as a cash or a rights offering. In table 1 we already gave a clear hint that cash offerings can be supposed to be more costly than rights offerings also in Switzerland. However, due to the fact that we have only 10 underwritten cash offerings in our sample it makes no sense to account for the impact of this offering method. This is why we use only the subsample of rights offerings in our regression analysis.

Now, taking into account all these additional independent variables the flotation cost function (2) can be extended in the following way:[15]

$$c = \beta_0 + \beta_1 GP + \frac{\beta_2}{GP} + \beta_3 SR + \beta_4 CMPX \qquad (3)$$

$$+ \beta_5 OPD + \beta_6 OPD^2 + \beta_7 BETA + \beta_8 FF$$

OLS-estimation results for different specifications of this regression equation are summarized in table 4. First of all, one can see that quite good results are obtained. Undoubtedly, the best results are generated by model specification (6) as we are able to explain about 57 percent of data variance. This is also strong evidence against the recently expressed presumption that underwriting fees may be clustered around some widely accepted spread. Moreover, also as far as the economies of scale view is concerned, our results are very interesting. In fact, we get an estimation for the regression coefficient β_1 which is not significantly different from zero. Hence, marginal flotation costs seem to be constant rather than decreasing. Moreover, in

Table 4: OLS-Estimation Results for Different Specifications of Equation (3), Rights Offerings
Period: 1996–2003

	Dependent Variable: Total Flotation Cost Spread (*c*)							
	Model	1	2	3	4	5	6	VIF
β_0	constant	**.0441**	**.0494**	**.0438**	**.0361**	**.0584**	**.0471**	
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
β_1	*GP*	3.99E-6	2.33E-6	–1.27E-6	–3.46E-6	–3.66E-6	–3.27E-6	1.396
		(0.134)	(0.323)	(0.610)	(0.126)	(0.167)	(0.132)	
β_2	*1/GP*	*.0564*	**–0.0694**	0.0020	**–0.0921**	**–0.0777**	**–0.0780**	1.074
		(0.059)	(0.010)	(0.971)	(0.002)	(0.011)	(0.001)	
β_3	*SR*		**–0.0186**	**–0.0161**	**–0.0089**	**–0.0195**	**–0.0143**	1.761
			(0.000)	(0.000)	(0.031)	(0.000)	(0.002)	
β_4	*CMPX*			**.0169**	**.0124**	**.0146**	**.0115**	1.531
				(0.001)	(0.006)	(0.002)	(0.008)	
β_5	*OPD*			0.0147	–0.0093	**-0.0065**		
				(0.316)	(0.256)	(0.0449)		
β_6	*OPD^2*			–0.0307				
				(0.124)				
β_7	*VOL*				**.5279**		**.4839**	1.597
					(0.000)		(0.000)	
β_7	*BETA*					0.0081		
						(0.105)		
β_8	*FF*					**–1.97E-4**	**–1.57E-4**	1.396
						(0.010)	(0.019)	
	N	64	64	61	61	61	61	
	adj. R^2	0.077	0.285	0.416	0.530	0.463	0.565	

Definitions: *c* = Total direct flotation costs in percent of gross proceeds; *GP* = Gross proceeds (million CHF); *SR* = Dummy variable set to 1, if issue was self-registered; *CMPX* = Dummy variable set to 1, if issue was complex, i.e. it was arranged via an international offering, the offering was a direct consequence of a merger, different share classes are issued within one offering, or the offering is accompanied by a stock split or by a restructuring of outstanding share classes; *OPD* = Offer price discount divided by the last non-diluted stock price; *VOL* = Annualized stock price volatility in percent; *BETA* = 250-days beta of stock returns; *FF* = Number of free floating stocks divided by the number of outstanding stocks. VIF = Variance inflation factor; it equals $1/(1 - \rho_k^2)$, where ρ_k^2 is the r^2 in the regression of the independent variable x_k on all the other variables (cf. GREENE (2002), p. 57). A VIF higher than 10 may detect a multicollinearity problem, because in this case the null hypothesis that the independent variable is redundant can only be rejected with a confidence level of less than 90 percent. p-values are given in parenthesis. Bold faced coefficients are significant at the 5 percent level, italic shaped coefficients at the 10 percent level, at least.

most of the different specifications we get a statistically significant negative value for β_2. This is strange, as fixed costs cannot be negative. Hence, the result may be interpreted in a way that there is a cost component not captured by our model leading to increasing average flotation costs. In this view, also this second result is clearly against the economies of scale view.[16] Finally it should be emphasized that we get a highly significant estimation for β_0, implying that there is a strong linear component in the flotation cost function. In fact, the results for model (6) indicate that the linear component amounts to 4.7 percent of gross proceeds.

As far as the impact of the different firm and issue specific variables is concerned, the results correspond only partially to our theoretical reasoning. First, flotation costs are lower, if the issuer chooses to self-register. In that case there is no lead underwriter different from the issuer acquiring legal responsibility for the content of the prospectus and managing the whole placement process; moreover, one could presume that in such cases investment banks involved in the underwriting process are not acting as advisers for the company.[17] Moreover, it has already been mentioned that the lower flotation cost of a self-registration is due to an accounting bias, as opportunity costs are not reported in the listing prospectus. Nevertheless, it is interesting to see that flotation costs are lower by about 1.4 percentage points, if the issuer chooses to self-register.

Second, increasing the complexity of an issue has a significant positive impact on flotation costs. In fact, if the shares are offered abroad, the offering was a direct consequence of a merger, different share classes are issued, or the offering is accompanied by a stock split or by a restructuring of outstanding share classes, the flotation costs increase by about 1 percentage points.

Third, we do not obtain stable results with respect to the impact of the offering price discount on flotation costs. In model specification (3) and (4) the offering price discount seems to have no influence regardless whether we allow only for a linear or also for a quadratic impact.[18] The results with respect to specification (5) reveal a significant negative impact of the offering price discount, which is economically meaningful. However, this result is not robust as a comparison of (4) and (5) reveals. This result is different from the U-shaped impact found by BÜHNER/KASERER (2002).

Fourth, as far as stock price riskiness is concerned the results are rather strong. From specifications (4) and (6) we can see that stand-alone risk has a strong positive impact on flotation costs. This is meaningful as the placement risk of the non hedged underwriter is the higher the higher stock price volatility is. Interestingly, market risk seems not to have such an important impact on flotation costs. Finally, we find a statistically significant impact of free float on flotation costs. However, the sign of this impact is against our economic reasoning as it predicts that flotation costs are lower the higher the free float is. From an economic viewpoint we have expected exactly the opposite, as placements efforts increase when there are no large shareholders giving at least an implicit take-up commitment. This finding is not in accordance with results reported in the literature.[19] Further investigation is needed here.

As far as the robustness of our results is concerned it should be noted that we do not have indications for severe multicollinearity problems. In fact, the variance inflation factors (VIF) reported in table 4 are far below the critical value of 10.[20] Also a multicollinearity check on the basis of the so called condition index did not reveal any problems.[21] Nevertheless, we would like to point out that according to the partial correlation matrix reported in table 5 at least some evidence for the existence of partial correlation problems can be found. However, given the robustness of our results for different model specifications this partial correlation issue may not cause too much concern.

Table 5: Partial Correlation Matrix of Independent Variables

	GP	*1/GP*	*SR*	*CMPX*	*OPD*	*OPD²*	*VOL*	*FF*
GP	1	–0.176	–0.145	**0.500**	–0.107	0.022	*0.296*	0.059
1/GP		1	–0.088	–0.168	**0.475**	**0.481**	0.074	–0.057
SR			1	*–0.231*	0.074	–0.164	**–0.473**	**–0.481**
CMPX				1	–0.125	–0.016	**0.433**	–0.031
OPD					1	**–0.395**	–0.236	0.039
OPD²						1	*0.253*	0.139
VOL							1	0.100
FF								1

Definitions: *GP* = Gross proceeds (million CHF); *SR* = Dummy variable set to 1, if issue was self-registered; *CMPX* = Dummy variable set to 1, if issue was complex, i.e. it was arranged via an international offering, the offering was a direct consequence of a merger, different share classes are issued within one offering, or the offering is accompanied by a stock split or by a restructuring of outstanding share classes; *OPD* = Offer price discount divided by the last non-diluted stock price; *BETA* = 250-days beta of stock returns; Bold faced correlation coefficients are significant at the 1 percent level, italic shaped coefficients at the 5 percent level, at least.

6. Conclusion

This paper addressed the issue how costs of raising external equity are determined and whether they are governed by economies of scale. It aims at extending the literature in at least two directions. First, it provides for the first time empirical evidence on the flotation cost structure on the Swiss capital market. We reported that flotation costs amount to 4.53 percent; this leads to the conclusion that the cost of raising capital seems to be rather high in Switzerland, especially when compared with France or Germany. However, we did not propose an explanation for this. Especially, we did not analyze the question whether this is due to some extent to oligopolistic competition in the investment banking industry. This question is left open for further research. Second, we provide evidence against the conventional wisdom that flotation technology is governed by economies of scale. In fact, we found evidence which supports the view that there may be diseconomies of scale, at least in Switzerland.

The paper carries out a cross-sectional analysis of 74 SEOs on the Swiss capital market over the years 1996–2003. By using a multiple regression approach we were able to explain about 57 percent of the variance in average flotation. This is against the presumption that flotation spreads are clustered. It turned out that flotation costs in Switzerland are the higher the more complex an issue is and the more risky the issuer's stock price is. If the issuing company decides do self-register instead of relying on the services of a lead manager it is able to reduce flotation costs significantly; however, a consistent part of this effect may be due to accounting biases. As far as the economies of scale view is concerned, we found evidence in favor of increasing average flotation costs. Therefore, our results are by far more conclusive with respect to the economies of scale view than the papers of ALTINKILIÇ/HANSEN (2000) and BÜHNER/KASERER (2002).

ENDNOTES

[1] A detailed analysis of indirect flotation costs of Swiss companies can be found in LODERER/ZIMMERMANN (1988).

[2] Cf. Listing Rules of the SWX, Part B, together with the Annex of the Listing Rules.

[3] In fact, over the period 1996 to 2003 we found only 10 cash offerings for which a listing prospectus had been filed.

[4] Unfortunately, it was not possible to record take-up commitments reliably for our sample firms.

[5] For a more detailed discussion of this issue cf. KASERER/KRAFT (2003), p. 485 n.

[6] For a detailed synopsis of these results and many others cf. BÜHNER/KASERER (2002), p. 320 n.

[7] Cf. SMITH (1977), p. 288 n. Note, however, that HANSEN/PINKERTON (1982) presented some evidence against the equity financing paradox; for a critical discussion of that paper cf. SMITH/DATH (1984).

[8] Cf. for example STOLL (1976), HANSEN/PINKERTON (1982), BHAGAT/FROST (1986), BAE/LEVY (1990), ECKBO/MASULIS (1992), NG/SMITH (1996) or LEE/LOCHHEAD/RITTER (1996). For a detailed synopsis of these results cf. BÜHNER/KASERER (2002), p. 320 n.

[9] BHAGAT/FROST (1986) find stock price volatility to be positively related not only to direct but also to indirect flotation costs.

[10] However, HANSEN (2001) offers an economic explanation for the clustering of IPO-spreads which is in line with the assumption of a competitive underwriting market.

[11] It should be noted here that our estimated cost functions seem to be rather accurate, as we have adjusted R^2 of up to 57 percent.

[12] Cf. ECKBO/MASULIS (1992), p. 320 n., and BÜHNER/KASERER (2002), p. 328 n., in this regard.

[13] Cf. HEINKEL/SCHWARTZ (1986). For an empirical oriented discussion cf. KASERER/BRUNNER (1997), for example.

[14] For a more detailed discussion cf. BÜHNER/KASERER (2002).

[15] It should be noted that by stating the cost function in this way we assume the additional independent variables to have an impact only on marginal costs but not on fixed flotation costs. This is, of course, an unjustified restriction in our model. However, due to the fact that we have only 64 observations and in order to avoid multicollinearity problems we accept it. For a detailed discussion of this issue cf. BÜHNER/KASERER (2002), p. 330 n.

[16] This is somehow different from other results in the literature, especially from those presented for the German market by BÜHNER/KASERER (2002). There, some evidence in favor of the existence of positive fixed costs has been found.

[17] One should remind in this context that in most cases self-registration was chosen when the issuer was a bank.

[18] It should be noted here that the simultaneous integration of the variables *OPD* and OPD^2 leads to a multicollinearity problem. Therefore, the results of equation (3) have to be interpreted carefully.

[19] Cf. for instance ECKBO/MASULIS (1992) and BÜHNER/KASERER (2002).

[20] VIF higher than 10 may detect a multicollinearity problem, because in this case the null hypothesis that the independent variable is redundant can only be rejected at a confidence level of less than 90 percent. Cf. GREENE (2002), p. 57.

[21] Cf. in this regard GREENE (2002), p. 58.

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