



ARTÍCULO

First-day and yearly yield following initial public offering in Israel 1998-2006

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Abstract Contrary to findings reported in the extant IPO literature between 2001 and 2006, average first-day returns in Israel's stock market resulted in a deficit return of -1.2% and the average one-year return resulted in an excess return of 10.5%. Estimating the relationship between yields and various explanatory variables, we found that daily yield is positively affected by excess demand and total equity capital, whilst negatively correlated with underwriting commissions, price of offerings and the total sum raised. The one-year return was found to be positively correlated with deficient underwriting and negatively correlated with first-day return and return on capital.

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Rentabilidad inicial y anual en ofertas públicas de activos en Israel durante los años 1998-2006

Resumen Contrariamente a las conclusiones halladas en la literatura existente sobre las Ofertas Públicas Iniciales entre 2001 y 2006, el promedio de rentabilidad el primer día en la Bolsa de Valores de Israel resultó en un déficit de -1,2%, mientras que el promedio anual de rentabilidad fue del 10,5%. Estimando la relación entre los rendimientos y las diversas variables explicativas, llegamos a la conclusión de que el rendimiento inicial está afectado positivamente por el exceso de demanda y el capital total, y correlacionado negativamente con las comisiones de suscripción, el precio de las ofertas y el importe total recaudado. Se demostró que la rentabilidad anual estaba correlacionada positivamente con la suscripción deficiente y negativamente con la rentabilidad inicial y la rentabilidad sobre el capital.

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1. Introduction

Initial public offering (IPO) is the first sale of stock by a private firm to the public (Cliff & Denis, 2004). IPO's are often issued by smaller, nascent companies, seeking capital to expand, but they are also common amongst large, privately-owned companies willing to become publicly traded (Ghosh, 2001).

In an IPO, the issuer obtains the assistance of underwriters in determining what category of security to issue (common or preferred), the timing of bringing it to the market, and the best offering price (Marrison, 2002).

Loughran and Ritter (2002) report that between 1990-1998, 3,025 US firms invested over 27 billion dollars in order to become publicly traded. This phenomenon has attracted many authors who have over the years attempted to explain it. Ritter (2003) for instance, found that the average first day yield of IPOs in the USA was 15.8%. According to this analysis, the average annual yield of all IPOs in the USA in most years was positive. Stability in excess first-day yields is the main reason for the scholarly as well as hands-on analysts' interest in this phenomenon. This phenomenon is not unique to the USA and according to Ritter (2003) typifies other countries. First day yields varied from 5.4% in Denmark (Hale & Santos, 2006) to 257% in China (Kao et al., 2009) with a median of 18.4% and 20.7% average yields for all nations.

Authors have raised several reasons for under-pricing. Akerlof (1970) was amongst the first to investigate this phenomenon suggesting that in cases of asymmetric information between sellers and buyers, buyers request a discount on the product cost because they are apprehensive lest they purchase an inferior product. Consequently, discount on initial issuance, results in under-pricing that generates, in turn excess first day yields. Later, Allen and Faulhaber (1989) hypothesized that firms' under-pricing prior to initial issuance indicates the firm's financial robustness.

A model in which executives elect to generate under-pricing in initial issue thus creating excess first-day yield in order to generate a momentum of positive information, is offered by Aggarwal et al. (2002b). This positive momentum is engendered by higher media interest and analysts' coverage because both prefer to deal with firms that display the most extreme performance. This positive momentum will push prices upwards, thus enable the selling of shares in prices higher than the price they would have received had they sold their shares during the initial issue even if it had been executed by quoting higher prices. Owners, according to Habib and Ljungqvist (2001), decide about the first-day yield indirectly in accordance with their holdings in the company and the number of shares they wish to issue. Owners may opt for a highly reputed underwriter and hence reduce under-pricing (Demers & Joos, 2007), but this would normally raise fees. In case owners decide to issue a small portion of the company shares, the cost of under-pricing is likely to be lower than the cost of qualitative underwriting. Pertinently, Ljungqvist and Wilhelm (2003) hypothesize that during the hi-tech bubble, owners chose to issue a relatively small number of the company shares at lower prices expecting to sell their shares following a noticeable upswing in share prices prior

to the end of the 'hot market'. These activities were fuelled by analysts' optimistic forecasts according to Brous, Datar and Kini (2009), and traders who prodded their customers to purchase shares. Lowry and Schwert (2004), argue in this vein that not updating the price of offers according to the accumulated information prior to issue does not amount to inefficiency on the part of underwriters since price adjustment is undertaken by investors. The impact of information available to the public on first day yields is negligible (Alexander et al., 2000). A thorough examination of the US market between 1980-2003 (Loughran & Ritter, 2004) shows that first-day yields fluctuate dramatically between periods such that a yield of 7% in the 1980s doubled to 15% in the 1990s, reaching an all-time high of 65% between 1999-2000 (internet bubble) following which yields dropped to just 12%. Additionally, during the Internet bubble the percentage of managerial ownership in their firms rose twofold, apparently because they attempted to generate a positive momentum in order to realize their holdings at a better price (Boyer, 2005).

An example of this exuberance is the large first-day yields to Internet IPOs, which averaged over 80% (Loughran & Ritter, 2004). However, 88% of Internet companies reported negative earnings in the year prior to their IPO, 91% of these firms had accumulated deficits, and many Internet firms did not even have revenues at the time of their IPOs (Bhattacharya et al., 2009: 4)

Another explanation for excess yields during the bubble years is that raising under-pricing was in fact an indirect payment for underwriters who increased issue coverage in financial markets. This pertained mostly to unprofitable startups that issued during the bubble years (Dolvin & Pyles, 2009; Ljungqvist & Wilhelm, 2003).

Hanley and Wilhelm (1995) argued that the main benefactors from short-term excess yields arising from initial issue are institutional investors who are often favored by underwriters. On top of the increased profit, institutional investors are expected to partake in 'inferior' issue, hence inferior issue are subsidised by more profitable ones. A positive relationship was found by Aggarwal et al. (2002a) between institutional investors and first-day yield. Part of this association is explained by the allocation of more shares to institutional investors in initial issuance typified by high early demand and the fact that these investors have valuable information that prompts them to take part in successful issue.

Much like in excess first-day yields, underperformed yield is expected in the long-run (Ritter, 1998). Long-term underperformed yield has been common in most countries over a considerable length of time. For instance, Ritter (1991) found that IPOs had under-performing yield that equalled 83.1% of the average market yield.

Under-performing yield mostly characterizes IPOs in years of highly active IPO market. This is because investors tend to be optimistic at certain times concerning nascent firms' income potential and these firms tend to capitalise on these windows of opportunity.

Exploring long-term yields, Dimovski and Brooks (2004) found over-optimism accompanying IPOs as shown by excess yields which decline thereafter into under-performing yield. A later study, however (Eckbo & Norli, 2005) investigating NASDAQ IPOs between 1973-2002, shows that considering

the firms' risk and financial leverage factors IPOs' yields equal market yields.

Pastor et al. (2006) studied 7,183 IPOs in the USA between 1975-2004. They found that, on average, firms' profitability declines following IPO and further, this decline was more significant amongst firms characterized by fluctuating profitability. Pastor et al. (2006) argue that the owners elect to undertake IPO at the zenith of their firms' profitability when they sense a looming decline. Owners gain highest yield on their holdings when selling the company whilst it is most profitable notably in light of an expected decline in its market capitalization (Zingales, 1995).

Pagano et al. (1998) indicated that the probability for a firm's IPOs is positively associated with the value of other firms of the same industry. This relationship is explained by the owners attempt to take advantage of erroneous pricing for the firm's market capitalization which is evidently affected by the relevant industry's trends in the market.

Cyclicality of 'hot' and 'cold' markets is widely discussed in the finance literature (*cf.* Derrien, & Womack, 2003; Freyboote, Rottke & Schiereck, 2008). A hot market is characterised according to Ljungqvist, Vikram and Singh (2006) by an excess of IPOs and continuous upsurge of trade indicators and volumes. Conventionally, a firm's decision concerning IPO timing is motivated by its willingness to minimize errors in its pricing (Alti, 2005). A hot market eventuates as a result of the confluence of several characteristics each of which is crucial in determining the value of firms. Available information and reduced uncertainty make IPOs less costly for upcoming companies (Lee, Bach & Baik, 2011). High offers for breakthrough companies induce additional IPOs. As time goes by, however, the quality of firms opting for IPOs in hot markets tend to decline.

As a whole, firms undertaking IPOs do so regardless of market conditions only for the sake of investment whilst firms opting for IPOs in hot markets do so in order to capitalize on the unique market circumstances amenable for mobilizing funds that are used mostly to service existing debt. In this vein, Benninga et al. (2005) indicate that firms tend to issue when share prices are high and this reflects the existence of same industry IPO aggregates. In contrast, when shares prices are low, firms tend to repurchase shares with the view of going public.

In accordance with the classic model, Jovanovic and Rousseau (2004) found that in times of low interest rates firms are predisposed to delay IPOs.

2. The Israeli scene

There are several reasons making the IPO market in Israel unique. First, compared with most other developed economies the Israeli IPO market is typified with disproportionately high number of hi-tech firms (Avnimelech & Teubal, 2004). In general the Israeli money market is globally oriented and subsequently many Israeli hi-tech firms (and others) are traded both domestically and in foreign stock exchanges notably NASDAQ (Hashai, 2011). Also, most Israeli companies involved in IPO's, invest heavily in R&D (Blass & Yafeh, 2001).

The Israeli money market has been structurally reformed such that as of 2006 ownership and management of provi-

dent, mutual and pension funds and underwriting were separated from the banks. This reform has enhanced competition of the public's financial assets by developing alternative investment vehicles to those offered by banks, and by decentralising the management of existing investment vehicles. It has also augmented competition in credit provision by developing non-bank credit instruments (Sokolov, 2006: 250). This structural reform constitutes an integral part of a comprehensive set of governmental policies designed to engender a more competitive and efficient capital market. These policies include the sale of new pension funds, the downsizing of issues of "earmarked" bonds (e.g. long governmental bonds with guaranteed yields), the equalization of tax rates on capital gains from foreign securities with those on domestic securities, and others (Ministry of Finance, 2004).

Consequently, we argue that IPO's in Israel are closely linked to the aforementioned structural reform that has altered taxing and so the Israeli market is evidently exposed to foreign money markets. When an Israeli or foreign firm does IPO the price it gets in the issuing is closer to the firm's real value, thus the Israeli IPO market is potentially attractive to foreign firms as they are likely to get a higher price at IPO's.

This study aims at measuring and explaining first-day yields and yearly yield in Israel. First-day yield is defined as the rate of change in the price of issuance unit on the first day following issuance where this yield is adjusted to the share index. Yearly yield is defined as the rate of change in share price as of the end of the first business day until a year after business has begun (McLean, Pontiff & Watanabe, 2009).

The sampled period, (January 2001-April 2006), is unique in terms of the Israel Stock Exchange as the General Share Index rose by over 200%, commensurate with a noticeable growth in trade volume. Moreover, that period earmarks the high-tech bubble when the Tel-Tech grew 4.5 times then declined below the 1999-2001 baseline.

Our study is the first to examine this unique period in Israel and it extends the number of parameters measured compared with previous studies addressing the Israeli scene.

Considerable differences exist between the 1980s and the 2000s with respect to periods of first-day yields. Barniv and Chen (1986) found the concrete yields at the first week of trade to be 42%. Amihud et al (2003) report that in the early 1990s, average first-day yield was 12%. Thus far, no study has explored more recent data.

We will provide information regarding first-day rate of yield and will explain changes in the first-day yields with respect to changes in the Israeli Stock Exchange and the IPOs market in particular.

3. Type of tenders

Two types of tenders are common in Israel, tender on price and on fixed price.

Kandel et al. (1999) using Dec. 1993 and Dec. 1996 data found that under the fixed price tender, first day yields are lower compared to the price system. Of the 284 IPOs between Nov. 1989 and Nov. 1993, Amihud et al. (2003)

found that tenders based on price were prevalent in 86% of the IPOs. Pertinently, Hauser et al. (2006) indicate that until 1993, tenders on price were bound by a limit on minimum and maximum prices. In fact, actual price equaled either the minimum or maximum price, aside from a few cases where an intermediate price was set. As of Dec. 1993, the Israel Securities Authority prohibited the fixing of maximum prices. This decision stemmed from the accumulation of maximum price offerings that resulted in investors gaining a small portion of the orders which reached an all time high in 1993 (Amihud et al., 2003). This regulatory decision enabled, in turn, the research of maximum price effects on the results of issue and first-day yields. However small, following the removal of maximum price, underpriced offerings still yielded positive first-day yields (4.6%).

4. Method

4.1. Data

Data for this study are based on firms that were engaged in IPOs at the Tel Aviv Stock Exchange between 1 January 1998 and 30 April 2006 as specified by the Stock Market Authority.

The sampled period was divided into two well characterized sub-periods in terms of the share market in Israel and IPO characteristics at the time.

The 1998-2000 period, or the 'Hi-Tech Bubble', was characterized by inflated prices and a relatively high number of start ups partaking in issue, 58% as opposed to 36% in the preceding period. The repercussions of the hi-tech bubble were severe, such that until the end of 2003 only five IPOs were carried out as opposed to 33 in 2000 and 19 in 2004.

During the sampled period, 122 IPOs were carried out, of which we had full information on 111 (Table 1).

4.2. Model and estimation

Data analyses for each issuance refer to two periods; first trading day or first-day yield and annual yield.

First day yield was calculated according to equation (1) below; as the yield between the price determined at issue

and the price of the issue unit's overall closure at the end of the first trading day adjusted to the shares index.

$$RE_1 = \frac{\frac{price_1}{index_1}}{\frac{price_2}{index_2}} - 1 \quad (1)$$

4.2.1. Yearly yield

Yearly yield is calculated according to equation 2 below, based on buying a share at the end of the first trading day and holding on to it for a year adjusted to the share index.

$$RE_{365} = \frac{\frac{price_{365}}{index_{365}}}{\frac{price_1}{index_1}} - 1 \quad (2)$$

4.3. Adjusting to the share index

The yields measured (first-day and yearly) are adjusted to the Israeli capital market performance in order to neutralize exogenous effects that included the entire market and not unique to firms issuing for the first time. The General Share Index provides the best approximation. 46% of the firms may be regarded as hi-tech associated with the Tel-Tech. This index includes all hi-tech firms whose market capitalization was higher than 80 million NIS. The high concentration of firms from one industry implies that the results are liable to be biased owing to industry effect. A comparison between hi-tech firms and all the rest is shown in figure 1 in which the Tel-Tech and the General Share Index are compared. Both indices differ between 1999-2001 and 2004-2006. To overcome this bias and on top of evaluating first-day and yearly yields by adjusting to the General Share Index, we further checked the yields of firms unaffiliated with the hi-tech industry by adjustment to the General Share Index and hi-tech firms were adjusted to the Tel-Tech Index. We did not adjust the entire sample to the corresponding industry indices because several industries did not have specific indices and the relatively low number of non-hi-tech firms in our sample.

Table 1 IPOs between 1998-2000 by years and the number of IPOs

Year	Total number of IPOs	IPOs in sample
1998	14	12
1999	12	11
2000	33	29
2001	1	1
2002	2	1
2003	2	1
2004	20	19
2005	25	25
2006	37	12

Data (IPOs excluded from the sample owing to incomplete data) were drawn from the firms' financial reports, results of issue, prospectuses and data of trade in securities at TASE. Trading data; Courtesy of Paradiecta and Yifat.

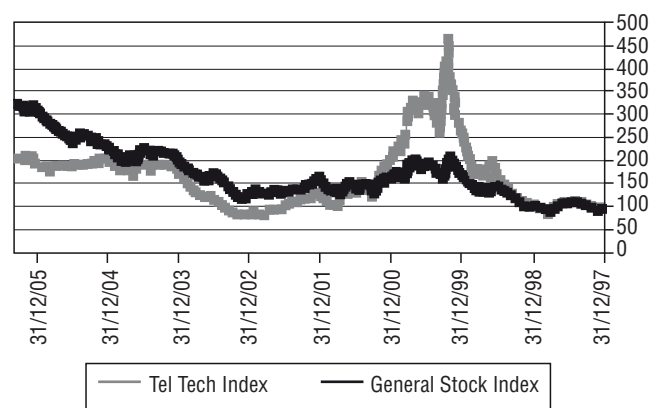


Figure 1 The General Share Index and the Tel-Tech Share Index 1/1/98-30/4/06.

4.4. Data analysis

Table 2 presents mean and standard deviation of yields for the 1998-2000 and 2001-2006 periods.

Initial examination of the results indicates that for the period 1998-2000, the findings are commensurate with previous studies, e.g. excess yield for the first-day and underperforming yearly yield, compared with the market yield (*cf.* Elliot & Schaub, 2008). The opposite applies to the 2001-2006 period when the first-day yield is negative, whilst the yearly yield is 10.5%. Correspondingly, the standard deviation of the first-day yield is small as opposed to higher STD for the yearly yield.

Mean yearly yield for 1998-2000 under performed by -33%. Mean yearly yield for 2001-2006 showed an excess of 10.5% contrary to previous studies. After adjusting the hi-tech firms' yield to the Tel-Tech Index, the mean first-day yield remained identical for the entire sample, but the yearly

yield improved from underperformance of -33.3% between 1998-2000 to -12%. The excess yearly yield between 2001-2006 grew from 10.5% to 17.2%. The mean yearly yield for the entire sample grew from underperformance of -10% to an excess yield of 3.6%, contrary to most reported findings in the literature.

The highest first-day yield was recorded in 1999 (8.5%) prior to the bubble as opposed to a much lower yield of 1.4% in 2000. Underperformance was recorded after 2000 (-1.4%--3.4%) with a minute excess yield of 0.4% in 2006.

5. Econometric estimation - first day yield

We estimated two equations. In the first equation, the dependent variable was daily yield of stocks engaged in IPOs at the Tel Aviv Stock Exchange between 1 January 1998 and 30 April 2006, adjusted to the shares index (Re1). In the second equation, hi-tech stocks engaged in IPOs were adjusted to the High-Tech Share Index whilst the rest of the stocks were adjusted to General Shares Index (Re1_hi).

After examining several versions and removing non-significant variables (at 10% level of significance) we reached estimation results presented in table 3 below:

Surprisingly, the dummy variable for the 1998-2000 issue and the dummy 2001-2006 issue were not found to be significant. This despite the fact that average market yield differed markedly within the two time periods.

We examined several companies' characteristics as explanatory variables, but found that only companies' share capital proved statistically significant. We also examined funds

Table 2 Average first-day and yearly yields adjusted to the General Stock Index 1/1998-4/2006

Years	Number of firms	First-day		Yearly	
		Mean	STD	Mean	STD
1998-2000	52	1.8%	1.22	-33.3%	6.21
2001-2006	59	-1.2%	0.39	10.5%	11.41
1998-2006	111	0.2%	1.63	-10%	22.93

STD, standard deviation.

Table 3 Regression results – first day return R2

Variable	Re1		Re1_hi	
	Coefficient	Prob.	Coefficient	Prob.
C	0.022515	0.4287	0.025601	0.3793
FIX	0.057768	0.0578	0.070378	0.0308
HI_TECH	0.035031	0.0753	0.036034	0.0713
INDEX 30	0.392109	0.0881	0.428915	0.0677
UNDERWRITER_FEE	-0.62618	0.0029	-0.649128	0.0025
OVER	0.005276	0	0.004996	0.0001
OVER2	0.092858	0	0.093347	0.0000
PRICE	-0.039388	0.0114	-0.039598	0.0091
CAPITAL	0.249847	0.0408	0.253406	0.0405
SUM_RAISED	-0.293167	0.0596	-0.295894	0.0649
R ²	0.48652		0.486911	
R ² adjusted	0.441213		0.441638	
Prob. (F-statistic)	0.000		0.000	

Significant explanatory variables:

Fix – issuances of stocks were carried out at a fixed-price tender (Dummy variable).

HI_TECH – stocks belong to high tech sector (Dummy variable).

Index30 – General share index yield in last month.

UNDERWRITER_FEE – underwriter fee divided by overall immediate yield (Dummy variable).

OVER – Over underwriting of issuance (Dummy variable).

OVER2 – more than double underwriting of issuance (Dummy variable).

PRICE – Price of issued unit.

Capital – Companies' Share Capital.

SUM_RAISED – Funds raised.

raised relative to total assets and relative to share capital, but they too were not proved statistically significant.

The dummy variable representing the participation of institutional investors at the issue was not found to be significant.

Our findings show that factors effecting positively first-day yield are fixed-price tender, high-tech companies' issue, last month general index yield, underwriting issue, and companies' share capital, while factors affecting negatively first-day yield are underwriter fee, price of issue unit and sum raised.

6. Econometric estimation - yearly yield

As in the case of the first-day yield, we estimated two equations. In the first equation' the dependent variable is the yearly yield of stocks engaged in IPOs at the Tel Aviv Stock Exchange (hereafter TASE) between 1 January 1998 and 30 April 2006 adjusted to the shares index (re365). In the second equation, hi-tech stocks engaged in IPOs were adjusted to the High-Tech Share Index whilst the rest of stocks were adjusted to General Shares Index (re365_hi).

Following several iterations and removing non-significant variables (at 10% level), we reached the estimation results presented in table 4 below.

We examined several companies' characteristics as explanatory variables but only Return on Equity (RoE) was found to be significant.

Underwriting fee, the number of underwriters, a dummy variable representing issue between 2001 -2006, and a dummy variable representing issue of mixed units were not found to be significant.

Our findings show that factors affecting first year yield positively are underwriters, partial underwriting (inability

to underwrite all units), whilst factors affecting negatively first-year yield are issue between 1998-2000 and RoE.

7. Summary

The literature addressing IPO's shows that when a company first becomes public, it offers its shares to the public at reduced prices which, on average, results in excess return on the first-day of trade compared to the market, and on the other hand, deficient return in the long-run.

The literature concerning Israel's IPO indicates a declining tendency in first-day returns from an excess return of 42% during the 1980's to 12% in the early 1990's which continues to decline until reaching an excess return of approximately 4.6% in the late 1990's.

This paper is the first to examine the IPO market in Israel between 1998 -2006. During 2001-2006, the average first-day returns resulted in a deficit return of -1.2% and the average one-year return resulted in an excess return of 10.5%, contrary to the conventional returns reported in the literature. The first-day return for the entire period amounted to an excess of 1.2% and the average one-year return for the entire period of the sample resulted in a deficit return of -10%.

The high concentration of Hi-Tech companies raised the possibility of diverting the industry. In order to address this diversion, additional testing was conducted where returns of companies outside the high-tech industry were adjusted to the General Share Index and the returns of companies included in the Hi-Tech industry were adjusted to the Tel-Tech Index. After adjusting the returns of the H-Tech companies to the Tel-Tech Index, the average first-day return remained identical for the entire sample, yet the one-year return improved continuously overtime – from a deficit return of -33.3% in 1998-2000 to -12% in 2001-2006 and the excess

Table 4 Regression results – One year return

Variable	re365_hi		re365	
	β	p	β	p
C	0.078227	0.1543	0.050877	0.5284
RE1	-0.572160	0.0753		
RE1_HI			-0.802939	0.0574
PRE	-0.479679	0.0000	-0.427224	0.0002
UNDERWRITER_CONNECTED	0.205025	0.0323	0.294792	0.0194
UNDER	0.629728	0.0086	0.647616	0.0388
ROE	-0.062943	0.0259	-0.114464	0.0022
HI_TECH			0.266817	0.0115
R ²	0.356510		0.276142	
R ² adjusted	0.325868		0.234381	
Prob(F-statistic)	0.000		0.000006	

Significant explanatory variables:

RE1 – First day yield.

RE1-HI – First day yield (in the second equation).

PRE – issuance at 1998-2000 (Dummy variable).

UNDERWRITER_CONNECTED – underwriters are connected to the company (Dummy variable).

UNDER - partial underwriting (Dummy variable).

ROE – Return on equity.

HI_TECH – stocks belong to high tech sector (Dummy variable).

one-year return during 2001-2006 increased from 10.5% to 17.2%. The average one-year return for the entire sample increased from deficit returns of -10% to an excess return of 3.6%, contrary to most findings reported in the literature.

We econometrically estimated the relationship between the yields (first-day and yearly) and various company-related explanatory variables and to market activities.

First-year yield was found to increase with underwriters associated with the company and with partial underwriting (inability to underwrite all units), whilst factors affecting negatively over yearly yield are issuance at 1998-2000 and ROE, a rather surprising finding.

The findings show that first-day yield is positively affected by the fixed-price tender, issue of hi-tech firms, General Index yield in the last month, over underwriting of issuance, and the companies' share capital, while factors resulting in negative effect over the first day yield are underwriter fee, price of issue unit and the sum raised.

We found that contrary to previous studies addressing the Israeli IPO market and studies addressing a broad range of international markets, underpricing is not found in this study. This we believe may be explicated by several factors. First, the Israeli money market has been structurally reformed over the past decade. Banks are no longer allowed by the regulator to manage pension, provident and mutual funds and notably underwriting. In addition, the reform equalized tax rates over local and foreign financial investments, which largely increased competition at the stock market. Second, the Israel's industrial structure differs markedly from most other developed economies specifically owing to a disproportionately high number of hi-tech and R&D-intensive firms. A fair number of the firms, chiefly hi-tech, are sold in-turn to global companies at high returns and therefore pricing is higher at the issue.

Third, most Israeli IPO's are characterized by excess underwriting which might positively affect the price.

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