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Wealth Effects of Seasoned Equity Offerings: A Meta-Analysis*

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ABSTRACT

We use meta-analysis to review studies on announcement effects associated with seasoned equity offerings. Our sample includes 199 studies from 38 leading finance journals and Social Sciences Research Network working papers. The studies cover different countries, but the US is particularly well-represented with 131 studies. We find a statistically significant mean cumulative abnormal return of –0.98%. Abnormal returns are more negative for equity issues by US companies and for non-US rights issues and are less negative for private placements. In addition, wealth effects are more negative when the proceeds are used for debt reduction, when the SEO is issued shortly after IPO, and for issues by nondividend-paying companies and industrial companies. We identify important avenues for future research.

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I. INTRODUCTION

Companies that need capital often turn to Seasoned Equity Offerings (SEOs) to fulfill their financial needs. Over the period 2000 to 2011, US companies alone raised $1146 billion with SEOs.[1]

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1 Over the same period, they raised $510 billion with convertible debt issues and $6635 billion with straight debt issues (Dutordoir et al. 2014).

SEOs are particularly important for firms that want to finance growth opportunities. Interestingly, a wide range of studies around the world find that announcements of SEOs are associated with negative abnormal stock returns. For example, an overview paper of Eckbo and Masulis (1995) finds average abnormal returns of –3.1% for US SEOs. These negative abnormal returns are generally explained by two theories. The theory of Myers and Majluf (1984) is based on asymmetric information between managers and shareholders. In their model, a SEO is perceived as bad news because the market will assume that managers, who have better information than shareholders, try to sell overpriced equity. The market timing theory of Baker and Wurgler (2002) argues that managers try to time the market and issue equity when valuations are highest. This theory is also consistent with negative abnormal returns around the announcement of an SEO.

Many empirical studies outside the US also find negative abnormal returns, but the results in several countries paint a different picture. A potential explanation for differences across countries relates to the characteristics of the offerings. For example, the popularity of rights offerings varies across countries. However, to confuse matters, attributes have been linked to more positive announcement effects in some studies, while they are linked to more negative announcement effects in other studies.

In this paper, we aim to systematically analyze the many papers on SEOs that present different findings for different countries and for different attributes of SEOs. For this purpose, we use meta-analysis. Until now, this technique has not been used very often in finance research, but it is more widely applied in other disciplines, such as epidemiology, education, and management.[2] The specific type of meta-analysis that we use is generally referred to as replication analysis. In this replication analysis we conduct regression analyses that summarize a wide range of existing studies. The abnormal returns that are reported in previous empirical studies are the dependent variable in these regression analyses. This type of meta-analysis combines insights from a wide range of studies and allows us to draw statistically strong conclusions on systematic country differences and/or differences associated with other characteristics of SEOs. A related advantage is that this type of analysis is more objective than a traditional literature review and allows for a test of a potential publication bias.

We look for papers that present event period abnormal returns associated with SEO announcements. The first source is a list of 38 leading academic finance journals. The second source consists of unpublished working papers (per December 31, 2017) that are available on the Social Sciences Research Network (SSRN). We find 199 studies that present abnormal returns associated with SEOs of which 161 papers are published in our list of journals and 37 studies are found on SSRN. These studies include a total of 861 subsample results. The mean abnormal return for SEOs is –0.98% and the median is –1.39%.

2 One recent exception in finance is the meta-analysis of relationship lending by Kysucky and Norden (2016).

Several findings emerge from our regression analysis. We find that rights issues are associated with more negative abnormal returns. Private placements, on the other hand, are associated with less negative announcement returns. When we study the interaction between rights issues and US studies, we find that this interaction term is positive, but we also establish that US issues in general are associated with more negative abnormal returns.

Interestingly, we do not find that information asymmetry has a significant effect on announcement returns. We do find evidence that SEOs that are done for paying back debt are associated with more negative abnormal returns. This result is in line with firms not fully exploiting the corporate tax shield associated with debt financing (Graham 2000). Dividend-paying companies that issue equity generally see less negative abnormal returns than nondividend-paying companies that issue equity.

Another interesting aspect of our study is that it allows for a comparison between the announcements returns in different types of publications. All else equal, we find that the announcement returns in top four journals are higher than those published in other journals and in SSRN working papers.

Our paper provides avenues for future research. The fact that a disproportional number of studies are on US data, combined with the differential wealth effects around the world, suggests that there is still ample room to study wealth effects in other countries, especially when institutional features differ. For example, we document that the effects of rights issues differ between US and non-US issuers. This finding calls for a worldwide study on rights issue, especially as countries differ in the extent to which existing shareholders in a rights issue are entitled to sell their rights if they do not wish to obtain more shares. Future research opportunities are also provided by factors that show up as significant in our meta-analysis but that have not been researched extensively. An example is the relevance of the stated use of proceeds. A further examination of these factors could lead to an even better understanding of the cost of issuing equity.

The remainder of this study is organized as follows: Section II briefly reviews the studies on the wealth effects that are associated with announcements of seasoned equity issues. Section III includes a discussion of the factors that have the potential to explain these wealth effects. The model for the meta-analysis is included in Section IV. Section V describes the results, and the paper is concluded in Section VI with a discussion of the implications of the results.

II. WEALTH EFFECTS OF SEOs

An extensive set of event studies on announcements of SEOs have been undertaken. All these studies document results for abnormal returns associated with the announcement. Some of these results are positive and significant, some are negative and significant, and others are not significant. We review these studies by using a meta-analysis technique. We follow the approach of Datta et al. (1992), Veld and Veld-Merkoulova [2009], and Abdul Rahim et al. (2014), who use meta-analysis to study the wealth effects associated with the announcement of mergers and acquisitions, spin-offs, and convertible bonds and warrant-bond offerings, respectively. In the meta-analysis in this paper, the estimates of the abnormal returns associated with issuances of seasoned equity are used as observations in a multifactor setting. The abnormal returns are the dependent variable and certain SEO characteristics are the independent variables. A multiple regression analysis is used to assess the impact of each factor on the dependent variable, with the factors corresponding to those that earlier studies hypothesized to influence the creation of wealth.

We start our search for papers that present wealth effect results for seasoned equity announcements by searching a list of 26 core finance journals identified by the study of Heck and Cooley (2009), who in turn base this set on several previous studies. This list is presented in Table 1.

The list of 26 journals of Heck and Cooley (2009) is slightly biased toward US studies. For that reason, we add 12 journals to the list that mostly focus on European and generally non-US studies: *Accounting and Finance*, *Critical Finance Review*, *European Financial Management*, *International Review of Finance*, *International Review of Financial Analysis*, *Journal of International Financial Markets, Institutions and Money*, *Journal of International Money and Finance*, *European Journal of Finance*, *Journal of Business*, *Review of Asset Pricing Studies*, *Review of Corporate Finance Studies*, and *Review of Finance* (formerly *European Finance Review*).

We include all studies that are published in the list of journals before December 31, 2017.[3] To test for a publication bias, we also include working papers. Since it is impossible to capture all working papers that present results of announcements of equity issues, we restrict ourselves to working papers that are included in the library of the SSRN. We include all SSRN working papers that are dated December 31, 2017 or earlier. We only include papers in English.

Table 1 presents the source of the papers in our study. In total we have 198 papers of which 161 are journal publications and 37 are SSRN working papers.[4] According to Table 1, the journals that published the most event studies on seasoned equity issues are *Journal of Financial Economics* (22), *Journal of Corporate Finance* (21), and *Journal of Banking and Finance* (12). A total of 11 journals did not publish any event study on seasoned equity issues. The latter result is not surprising, because some of the journals are clearly outside corporate finance, such as *Journal of Derivatives* and *Journal of Money, Credit, and Banking*.

Table 2 presents a review of the most important results from the 199 studies.

This table presents the source of the study, the country of the study, the research period analyzed, the main event window, the number of observations, and the average cumulative abnormal return (CAR). The table is split up in

3 We also include the papers that are published online on the websites of the journals per December 31, 2017. In some of these cases, the paper publication occurred in 2018.

4 The 199 studies that we have stem from 198 papers. The reason is that the paper by Holderness (2018) contains two separate studies: one for the US and one for Australia.

Table 1 Sources of the papers included in the meta-analysis

Source	Number of papers
List of 26 journals from Heck and Cooley (2009)	
Financial Analysts Journal (FAJ)	0
Financial Management (FM)	10
Financial Review (FR)	5
Journal of Applied Corporate Finance (JACF)	0
Journal of Applied Finance/Financial Practice and Education (JAF)	1
Journal of Banking and Finance (JBF)	12
Journal of Business Finance and Accounting (JBFA)	9
Journal of Corporate Finance (JCF)	21
Journal of Derivatives (JD)	0
Journal of Empirical Finance (JEF)	2
Journal of Finance (JF)	10
Journal of Financial and Quantitative Analysis (JFQA)	6
Journal of Financial Economics (JFE)	22
Journal of Financial Intermediation (JFI)	5
Journal of Financial Markets (JFM)	0
Journal of Financial Research (JFR)	8
Journal of Financial Services Research (JFSR)	0
Journal of Futures Markets (JFutM)	0
Journal of Money, Credit and Banking (JMCB)	0
Journal of Portfolio Management (JPM)	0
Pacific Basin Finance Journal (PBFJ)	8
Quarterly Review of Economics and Finance (QREF)	1
Review of Derivatives Research (RDR)	0
Review of Financial Studies (RFS)	5
Review of Pacific Basin Financial Markets and Policies (RPBFMP)	4
Review of Quantitative Finance and Accounting (RQFA)	1
Additional journals	0
Accounting and Finance (AF)	1
Critical Finance Review (CFR)	0
European Financial Management (EFM)	4
International Review of Finance (IRF)	2
International Review of Financial Analysis (IRFA)	1
Journal of International Financial Markets, Institutions and Money (JIFMIM)	2
Journal of International Money and Finance (JIMF)	1
European Journal of Finance (EJF)	4
Journal of Business (JB)	10
Review of Asset Pricing Studies (RAPS)	0
Review of Corporate Finance Studies (RCFS)	1
Review of Finance (European Finance Review) (RF/EFR)	5
Working papers	
Social Science Research Network (SSRN)	37
Total	198

market-oriented economies and network-oriented economies, using the definition of Moerland (1995). The first papers are on US data and are published in 1985. The most recent papers were forthcoming at the beginning of 2018. As is

Table 2 Studies of the market reaction to announcements of seasoned equity offerings

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Market-oriented country studies							
Bhagat et al. (1985)	JF	US	1982–1983	(0, 1)	344	−1.43	Calculated as the weighted average of two subsamples of 93 observations (CAR = −1.17%) and 251 observations (CAR = −1.53%);
Pettway and Radcliffe (1985)	FM	US	1973–1980	(−1, 0)	366	−0.51	***
Asquith and Mullins (1986)	JFE	US	1963–1981	(−1, 0)	266	−2.7	***
Masulis and Korwar (1986)	JFE	US	1963–1980	(0, 1)	972	−1.71	Calculated as the weighted average of two subsamples of 388 observations (CAR = −3.25%) and 584 observations (CAR = −0.68%);
Mikkelson and Partch (1986)	JFE	US	1972–1982	(−1, 0)	56	−3.44	***
Moore et al. (1986)	JF	US	1982–1983	(−1, 1)	229	−1.82	Calculated as the weighted average of four subsamples of 31 observations (CAR = −0.8%), 53 observations (CAR = −2.43%), 64 observations (CAR = −0.98%), and 81 observations (CAR = −2.48%);
Schipper and Smith (1986)	JFE	US	1965–1983	(−4, 0)	39	−0.35	***
Kalay and Shimrat (1987)	JFE	US	1970–1982	(0, 0)	455	−3.78	***
Barclay and Litzenberger (1988)	JFE	US	1981–1983	(0, 1)	218	0.48	***
Hansen (1988)	RFS	US	1964–1986	(−1, 0)	102	−2.99	Calculated as the weighted average of two subsamples of 80 observations (CAR = −1.21%) and 22 observations (CAR = −2.61%);

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Poloncheck et al. (1989)	JBF	US	1975–1984	(–1, 1)	44	–1.38	***
Wansley and Dhillon (1989)	JFR	US	1978–1985	(0, 1)	19	1.51	***
Wruck (1989)	JFE	US	1979–1985	(–1, 0)	99	1.89	*
Hansen and Crutchley (1990)	JB	US	1975–1982	(–1, 0)	109	–3.65	***
Bayless and Chaplinsky (1991)	JFI	US	1974–1983	(–1, 0)	223	–0.03	***
Denis (1991)	JB	US	1982–1986	(–1, 0)	83	–1.06	Calculated as the weighted average of four subsamples of 9 observations (CAR = –4.33%), 8 observations (CAR = –3.62%), 31 observations (CAR = –0.31%), and 35 observations (CAR = –0.31%);
Korajczyk et al. (1991)	RFS	US	1978–1983	(–1, 0)	1024	–2.69	***
Lease et al. (1991)	JF	US	1981–1983	(–1, 0)	405	–0.12	n.r.
Loderer et al. (1991)	JF	US	1969–1982	(–1, 0)	430	–0.93	**
Brous and Kini (1992)	JFR	US	1986–1985	(–1, 1)	246	–2.64	***
Diltz et al. (1992)	JBF	US	1980–1988	(–1, 0)	234	–2.4	n.r.
Eckbo and Masulis (1992)	JFE	US	1963–1981	(–1, 0)	1216	–1.52	Calculated as the weighted average of six subsamples of 389 observations (CAR = –3.34%), 646 observations (CAR = –0.80%), 41 observations (CAR = –1.03%), 87 observations (CAR = –0.53%), 26 observations

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
							(CAR = −1.39%), and 27 observations (CAR = 0.23%)
Jain (1992)	RFS	US	1979–1983	(−2, 0)	269	−2.89	***
Pilotte (1992)	JB	US	1963–1984	(−1, 0)	279	−3.85	n.r.
Tripathy and Rao (1992)	JFR	US	1980–1984	(−1, 0)	138	−2.62	***
Choe et al. (1993)	JEF	US	1963–1983	(−1, 0)	1456	−1.39	Calculated as the weighted average of two subsamples of 669 observations (CAR = −2.42%) and 787 observations (CAR = −0.52%)
Hertzel and Smith (1993)	JF	US	1980–1987	(−3, 0)	106	1.72	***
Jegadeesh et al. (1993)	JFE	US	1980–1986	(−1, 1)	411	−1.16	n.s.
Manuel et al. (1993)	JB	US	1971–1986	(−1, 0)	191	−2.84	***
Varma and Szewczyk (1993)	JBF	US	1975–1988	(−1, 0)	62	−0.98	n.r.
Denis (1994)	JFQA	US	1977–1990	(0, 1)	435	−2.49	***
Sant and Ferris (1994)	JBFA	US	1965–1987	(−1, 0)	61	−1.44	***
Bayless and Chaplinsky (1996)	JF	US	1968–1990	(−1, 0)	1884	−2.32	Calculated as the weighted average of three subsamples of 1125 observations (CAR = −2%), 288 observations (CAR = −3.3%), and 471 observations (CAR = −2.5%);
Lee (1997)	JF	US	1980–1984	(−1, 0)	405	−2.91	***
Singh (1997)	JFE	US	1963–1985	(−1, 0)	63	−1.07	***
Slovin and Sushka (1997)	JF	US	1975–1993	(−1, 0)	38	−4.06	***

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Slovin et al. (1994)	JBF	US	1973–1988	(–1, 0)	175	–2.87	***
Akhigbe and Madura (2001)	FR	US	1983–1996	(–1, 1)	105	–0.63	***
Clarke et al. (2001)	JFQA	US	1984–1996	(–1, 1)	3266	–1.79	Calculated as the weighted average of two subsamples of 174 observations (CAR = –3.3%) and 3092 observations (CAR = –1.7%);
Hadlock et al. (2001)	JB	US	1983–1994	(0, 1)	641	–2.62	n.r.
Hertzel et al. (2002)	JF	US	1980–1996	(–3, 0)	619	2.4	***
Wu and Kwok (2002)	FM	US	1985–1995	(–1, 0)	2069	–1.86	n.r.
Altinkilic and Hansen (2003)	JFE	US	1990–1997	(0, 0)	1703	1.7	***
Byoun and Moore (2003)	JCF	US	1980–1997	(–1, 0)	4259	–2.64	n.r.
D'Mello et al. (2003)	FR	US	1980–1995	(–1, 1)	2190	–1.63	n.r.
Higgins et al. (2003)	JFR	US	1980–1997	(0, 0)	99	–0.65	**
Byoun (2004)	JB	US	1980–1997	(–1, 0)	4259	–2.64	n.r.
Chang and Shin (2004)	PBFJ	US	1997–2000	(–1, 1)	673	–2.27	***
Clarke et al. (2004)	JB	US	1980–1996	(–1, 1)	424	–2.25	***
Heron and Lie (2004)	JB	US	1980–1998	(–1, 1)	4708	–2.32	n.r.
Kadiyala and Rau (2004)	JB	US	1980–1994	(–1, 1)	720	–2.56	***

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Datta et al. (2005)	JB	US	1992–1999	(–1, 1)	444	–1.7	***
Krishnamurthy et al. (2005)	JFI	US	1983–1992	(–1, 0)	397	1.43	***
Rauterkus and Song (2005)	FM	US	2001–2002	(0, 1)	163	–2.55	n.r.
Zhang (2005)	FR	US	1990–2000	(–1, 1)	3857	–1.76	Calculated as the weighted average of two subsamples of 918 observations (CAR = –2.4%) and 2939 observations (CAR = –1.56%);
Akhigbe et al. (2006)	JFR	US	1987–2001	(–1, 1)	2360	–2.21	Calculated as the weighted average of two subsamples of 2094 observations (CAR = –2.78%) and 266 observations (CAR = 2.25%);
Brooks et al. (2006)	SSRN	US	1980–2002	(–1, 1)	5975	–2.1	***
Kennedy et al. (2006)	JEF	US	1991–2000	(–1, 0)	514	–1.68	***
Vijh (2006)	JF	US	1981–2002	(–1, 1)	90	–0.11	n.s.
Barclay et al. (2007)	JCF	US	1979–1997	(–1, 0)	559	1.7	***
Dai (2007)	JCF	US	1995–2003	(0, 3)	510	0.31	n.r.
Marciukaityte and Pennathur (2007)	FR	US	1981–1996	(–3, 0)	671	3.69	Calculated as the weighted average of two subsamples of respectively 499 observations (CAR = 3.93%) and 172 observations (CAR = 2.98%);
Aggarwal and Zhao (2008)	IRFA	US	1983–2003	(–1, 1)	2166	–2.59	***
Autore et al. (2008)	JCF	US	1990–2003	(–1, 1)	1198	–1.25	Calculated as the weighted average of two subsamples of 857 observations (CAR = –1.61%) and 341 observations (CAR = –0.3%);

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Gao and Mahmudi (2008)	SSRN	US	1980–2004	(–1, 1)	6950	–1.6	n.s.
Smart et al. (2008)	SSRN	US	1990–2001	(–1, 1)	1962	–2.09	n.r.
Walker and Yost (2008)	JCF	US	1997–2000	(0, 1)	438	–2.76	n.r.
Elliott et al. (2009)	JBF	US	1990–2002	(–1, 0)	99	–1.1	***
Lee and Masulis (2009)	JFE	US	1990–2002	(0, 1)	963	–2.67	***
Song (2009)	SSRN	US	1981–2006	(–1, 0)	111	–0.42	n.s.
Wruck and Wu (2009)	JCF	US	1980–1999	(–3, 0)	1818	2.02	***
Adler and Shea (2010)	SSRN	US	1982–2007	(0, 1)	717	–0.44	*
Chemmanur et al. (2010)	SSRN	US	1980–2004	(0, 1)	5630	–0.8	***
Chen et al. (2010a)	JBF	US	1997–2003	(–1, 0)	288	2.48	***
Chen et al. (2010b)	JCF	US	1996–2006	(–4, 5)	3821	3.34	n.r.
Francis et al. (2010)	JFQA	US	1985–2000	(–1, 1)	70	–0.02	n.s.
Gao and Ritter (2010)	JFE	US	1996–2007	(–1, 0)	3276	–1.72	n.r.
Hovakimian and Hutton (2010)	JFQA	US	1970–2003	(–1, 1)	3404	0.2	Calculated as the weighted average of two subsamples of 1441 observations (CAR = 0.16%) and 1963 observations (CAR = 0.23%);
Intintoli and Kahle (2010)	FM	US	1980–2004	(–5, 0)	7720	–2.04	Calculated as the weighted average of two subsamples of 2917 observations

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
							(CAR = 5.01%) and 4803 observations (CAR = 6.32%);
Karpavicius and Suchard (2010)	SSRN	US	1996–2005	(−1, 0)	165	−2.09	***
Krishnan et al. (2010)	JFI	US	1983–2005	(−1, 0)	276	−0.85	Calculated as the weighted average of two subsamples of 73 observations (CAR = −0.81%) and 203 observations (CAR = −0.87%)
Tandon et al. (2010)	JAF	US	1980–2005	(−1, 0)	2526	−1.44	n.r.
Ang and Cheng (2011)	JFR	US	1980–1995	(−3, 3)	202	−1.2	***
Autore et al. (2011)	EFM	US	1997–2005	(0, 1)	628	−2.07	n.r.
Booth and Chang (2011)	JFR	US	1975–2002	(−1, 0)	1731	−2.59	Calculated as the weighted average of two subsamples of 548 observations (CAR = −2.8%) and 1183 observations (CAR = −2.5%);
Demiralp et al. (2011)	JCF	US	1982–2006	(−1, 1)	3093	−1.39	***
Gokkaya and Roskelley (2011)	SSRN	US	1997–2004	(−1, 1)	475	−2.95	n.s.
Prakash et al. (2011)	SSRN	US	1997–2006	(−1, 1)	1681	−3.36	Calculated as the weighted average of two subsamples of 1466 observations (CAR = −3.63%) and 215 observations (CAR = −1.25%)
Wang et al. (2011)	RQFA	US	1978–2005	(−1, 0)	3029	−1.78	***
Barclay et al. (2012)	SSRN	US	1970–2006	(−1, 1)	4354	−2.42	n.r.

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Chaudhuri and Seo (2012)	IFMIM	US	1994–2003	(−1, 1)	2193	−2.4	n.r.
Deng et al. (2012)	SSRN	US	1986–2009	(−3, 3)	814	−0.47	n.r.
Duca et al. (2012)	JBF	US	1984–2009	(−1, 1)	4885	−2.45	Calculated as the weighted average of three subsamples of 3579 observations (CAR = −2.343%), 1143 observations (CAR = −2.665%), and 163 observations (CAR = −3.218%)
Dutordoir and Hodrick (2012)	SSRN	US	1999–2008	(0, 0)	343	−1.76	***
Floros and Sapp (2012)	JBF	US	1995–2008	(−2, 2)	6371	1.38	n.r.
Gokkaya and Roskelley (2013)	SSRN	US	1996–2007	(−1, 1)	2099	−1.86	***
Qian et al. (2012)	JFR	US	1990–2007	(−1, 1)	2000	−2.1	n.r.
Zeidler et al. (2012)	JCF	US	1980–2002	(−1, 1)	2905	−1.8	***
Bradley and Yuan (2013)	JCF	US	1997–2006	(−1, 1)	1777	−2.4	***
Gustafson (2013)	SSRN	US	2000–2011	(0, 1)	1029	3.01	Calculated as the weighted average of two subsamples of 626 observations (CAR = 3.38%) and 403 observations (CAR = 2.44%);
Jiang et al. (2013)	SSRN	US	1970–2006	(−1, 1)	1610	−3.46	n.r.
Zhang (2013)	SSRN	US	1970–2009	(0, 1)	5074	−2.28	Calculated as the weighted average of three subsamples of 1522 observations (CAR = −2.14%), 2030 observations (CAR = −2.09%), and 1522 observations (CAR = −2.71%).
Brisker et al. (2014)	JBF	US	1993–2006	(−1, 1)	1284	−2.68	n.r.

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Cline et al. (2014)	JCF	US	1979–2011	(–2, 2)	1152	–1.62	***
Cornett et al. (2014)	SSRN	US	2002–2011	(–1, 1)	460	–2.49	n.r.
Fich et al. (2014)	JFE	US	1996–2006	(–2, 2)	548	–0.5	*
Gokkaya and Highfield (2014)	FM	US	1997–2009	(–1, 1)	1032	–2.62	***
Hao (2014)	FM	US	1984–2008	(–1, 1)	2668	–1.41	n.r.
Henderson and Zhao (2014)	JCF	US	2000–2010	(–1, 0)	83	–7.85	***
Kim and Purnanandam (2014)	RF	US	1982–2006	(0, 1)	4613	–1.97	n.r.
Park (2014)	SSRN	US	1995–2010	(–1, 1)	2466	–2.86	***
Akhigbe and Whyte (2015)	JCF	US	1996–2012	(–1, 1)	2775	–2.02	***
Billett et al. (2015)	JFI	US	2001–2010	(–2, 2)	1851	1.81	Calculated as the weighted average of two subsamples of 743 observations (CAR = 5.46%) and 1108 observations (CAR = –0.63%).
Pinto-Gutierrez (2015)	SSRN	US	2003–2012	(–1, 1)	917	–2.8	***
Autore and DeLisle (2016)	RCFS	US	1990–2009	(0, 1)	1416	–2.12	n.r.
Boone et al. (2016)	JFE	US	1996–2013	(–1, 1)	2231	–3.19	Calculated as the weighted average of two sub-samples of respectively 1351 observations (CAR = –3.36%) and 880 observations (CAR = –2.92%).
Duca (2016)	JCF	US	1975–2007	(–1, 1)	5371	–2.22	***

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Ferreira and Laux (2016)	JFQA	US	1990–2005	(0, 1)	410	−1.8	St.dev = 0.06
Golubov et al. (2016)	RF	US	1985–2009	(−2, 2)	3212	−3.16	***
Holderness and Pontiff (2016)	JFE	US	1983–2009	(−1, 1)	164	0	n.s.
Michaely et al. (2016)	JFE	US	1995–2010	(0, 1)	4492	−2.2	***
Walker et al. (2016)	FM	US	1995–2008	(0, 1)	670	−2.34	n.r.
Berkman et al. (2017)	RF	US	2007–2011	(0, 1)	339	2.22	***
Deshmukh et al. (2017)	JCF	US	1988–2011	(−1, 1)	6852	−2.09	***
Dutordoir et al. (2017)	SSRN	US	2004–2013	(0, 1)	934	−4.591	n.r.
Lim et al. (2017)	SSRN	US	2001–2015	(−1, 1)	2963	4	***
Walker and Wu (2017)	SSRN	US	1994–2001	(−3, 3)	2555	−3.44	***
Billett et al. (2018)	JFQA	US	2008–2011	(−1, 1)	627	−4.39	Calculated as the weighted average of two subsamples of 132 observations (CAR = −3.74%) and 495 observations (CAR = −4.56%)
Chan et al. (2018)	FM	US	1997–2004	(0, 1)	934	−2.88	***
Johnson et al. (2018)	JFI	US	1986–2005	(−1, 1)	1946	−3.14	Calculated as the weighted average of two subsamples of 372 observations (CAR = −4.15%) and 1574 observations (CAR = −2.9%);
Holderness (2018)[(2)]	JFE	US	1979–1997	(−1, 1)	594	1.91	Calculated as the weighted average of two subsamples of 206 observations

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
							(CAR = 3.55%) and 388 observations (CAR = 1.04%).
Chikolwa and Kim (2009)	SSRN	Australia	2000–2008	(–15, 1)	277	–2.13	***
Holderness (2018)	JFE	Australia	1999–2004	(–1, 1)	510	3.72	Calculated as the weighted average of two subsamples of 221 observations (CAR = 6.39%) and 289 observations (CAR = 1.68%).
Pandes (2010)	JBF	Canada	1993–2005	(–1, 0)	748	–0.54	n.r.
Maynes and Pandes (2011)	EFM	Canada	1993–2005	(–1, 1)	347	2.99	Calculated as the weighted average of two subsamples of 116 observations (CAR = –6.46%) and 231 observations (CAR = 1.24%);
Dong et al. (2012)	FM	Canada	1998–2007	(–1, 1)	1125	–0.5	n.s.
Corby and Stohs (1998)	EJF	Ireland	1987–1994	(0, 1)	95	–0.56	n.s.
Marsden (2000)	PBFJ	New Zealand	1976–1984	(0, 1)	88	–1.01	***
Anderson et al. (2006)	PBFJ	New Zealand	1990–2002	(0, 1)	70	0.15	n.s.
Slovin et al. (2000)	JFE	UK	1986–1994	(–1, 0)	366	–1.88	Calculated as the weighted average of four subsamples of 64 observations (CAR = –1.5%), 119 observations (CAR = –2.09%), 52 observations (CAR = –2.16%), and 131 observations (CAR = –1.77%).
Armitage (2002)	JBFA	UK	1985–1996	(–1, 0)	1008	–0.96	***
Korteweg and Renneboog (2003)	SSRN	UK	1992–1999	(–1, 1)	52	0.53	Calculated as the weighted average of two subsamples of 38 observations (CAR = –1.8%) and 14 observations (CAR = 4.06%);
Iqbal (2008)	JBFA	UK	1988–1998	(–1, 1)	585	–1.8	***

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Armitage and Capstaff (2009)	EJF	UK	1991–1995	(–1, 0)	318	1.55	***
Armitage (2012)	EJF	UK	2003–2006	(–1, 1)	261	–0.38	Calculated as the weighted average of three subsamples of 47 observations (CAR = –2.97%), 134 observations (CAR = 0.95%), and 80 observations (CAR = –1.08%);
Dissanaike et al. (2014)	JIMF	UK	2003–2012	(–3, 3)	700	–0.63	n.s.
Dionysiou (2015)	EJF	UK	1998–2008	(–1, 1)	322	2.22	n.s.
Silva and Bilinski (2015)	JBFA	UK	1994–2007	(–1, 1)	1678	0.36	Calculated as the weighted average of three subsamples of 247 observations (CAR = –2.30%), 873 observations (CAR = 0.02%), and 558 observations (CAR = 2.08%).
Network-oriented country studies							
Huang et al. (2009)	SSRN	China	1998–2004	(0, 1)	340	–0.86	***
Fonseka et al. (2014)	IFMIM	China	2006–2010	(–3, 0)	218	1.2	***
Huang et al. (2016)	JCF	China	2006–2014	(0, 1)	101	–1.13	***
Liu et al. (2016)	JBFA	China	1991–2010	(0,0)	1588	–0.56	Calculated as the weighted average of three subsamples of 974 observations (CAR = –0.63%), 239 observations (CAR = –0.56%), and 375 observations (CAR = –0.37%).
Chen (2017)	AF	China	1999–2010	(–1, 1)	631	2.86	***
Huang et al. (2017)	SSRN	China	2006–2014	(0, 1)	818	1.68	***
He et al. (2018)	IRF	China	2005–2013	(–1, 1)	972	21.1	***

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Gajewski and Ginglinger (2002)	EFR	France	1986–1996	(0, 1)	219	–0.8	n.r.
Gajewski et al. (2007)	JCF	France	1986–2000	(0, 1)	284	–0.54	Calculated as the weighted average of two subsamples of 243 observations (CAR = –0.52%) and 41 observations (CAR = –0.65%)
Koenig-Matsoukis (2012)	SSRN	France	1995–2006	(0, 0)	121	–0.58	n.s.
Ginglinger et al. (2013)	JBFA	France	1986–2000	(–1, 0)	178	–0.73	n.r.
Baruch et al. (2017)	JFE	France	2003	(0, 1)	36	0.32	Calculated as the weighted average of two subsamples of 22 observations (CAR = 3.41%) and 14 observations (CAR = –4.53%).
Bessler et al. (2016)	EFM	Germany	1998–2002	(–1, 1)	71	3.53	*
Tsangarakis (1996)	FM	Greece	1981–1990	(–1, 0)	49	3.97	***
Espenlaub et al. (2008)	SSRN	Greece	1992–1999	(–1, 1)	129	–1.37	***
Wu and Wang (2002)	SSRN	Hong Kong	1989–1997	(–1, 0)	180	–3.37	***
Wu et al. (2005)	RF	Hong Kong	1989–1997	(–1, 0)	405	1.94	Calculated as the weighted average of two subsamples of 99 observations (CAR = 1.97%) and 306 observations (CAR = 1.93%)
Ching et al. (2006)	PBFJ	Hong Kong	1993–1998	(–1, 0)	506	1.09	***
Lee et al. (2014)	PBFJ	Hong Kong	2003–2011	(–1, 1)	267	–0.25	Calculated as the weighted average of two subsamples of 110 observations

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
							(CAR = −11.9%) and 157 observations (CAR = 7.91%).
Lee et al. (2017)	IRF	Hong Kong	2003–2012	(0, 1)	361	−12.82	Calculated as the weighted average of two subsamples of 217 observations (CAR = −15.85%) and 144 observations (CAR = −8.25%).
Marisetty et al. (2008)	PBFJ	India	1997–2005	(−1, 0)	67	0.32	n.s.
Hauser et al. (2003)	JCF	Israel	1989–1997	(−5, 0)	76	0.91	Calculated as the weighted average of two subsamples of 47 observations (CAR = 0.57%) and 29 observations (CAR = 1.46%)
Bigelli (1998)	EFM	Italy	1980–1994	(−1, 1)	82	0.79	n.s.
Kato and Schallheim (1993)	PBFJ	Japan	1974–1988	(0, 1)	136	2.5	Calculated as the weighted average of two subsamples of 76 observations (CAR = 4.98%) and 60 observations (CAR = −0.65%)
Kang and Stulz (1996)	RFS	Japan	1985–1991	(−1, 1)	282	1.26	Calculated as the weighted average of three subsamples of 185 observations (CAR = 0.45%), 69 observations (CAR = 3.13%), and 28 observations (CAR = 2.02%)
Cooney et al. (2003)	RFS	Japan	1974–1993	(−1, 1)	544	0.63	***
Kato and Suzuki (2012)	SSRN	Japan	1994–2009	(−1, 1)	830	−2.35	***
Shimizu and Xu (2014)	SSRN	Japan	2005–2011	(−1, 1)	25	−4.31	***
Morita (2016)	SSRN	Japan	2010–2013	(0, 0)	45	−1.92	Calculated as the weighted average of two subsamples of 24 observations (CAR = −2.20%) and 21 observations (CAR = −1.61%).

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Salamudin et al. (1999)	PBFJ	Malaysia	1980–1995	(0, 1)	72	–0.91	n.s.
De Jong and Veld (2001)	JBF	Netherlands	1977–1996	(–1, 1)	84	–1.07	*
Kabir and Roosenboom (2003)	JCF	Netherlands	1984–1999	(0, 1)	58	–2.79	***
Bohren et al. (1997)	JFE	Norway	1980–1993	(–1, 0)	188	0.47	**
Krakstad and Molnar (2015)	SSRN	Norway	1992–2010	(–1, 1)	1934	–2	n.s.
Duong et al. (2015)	JBFA	Singapore	1997–2007	(–1, 1)	189	0.35	Calculated as the weighted average of two subsamples of 137 observations (CAR = 2.00%) and 52 observations (CAR = –3.98%).
Martin-Ugedo (2003)	JBFA	Spain	1989–1997	(–1, 0)	57	–1.25	***
Cronqvist and Nilsson (2005)	JFE	Sweden	1986–1999	(–1, 1)	296	3.54	Calculated as the weighted average of two subsamples of 160 observations (CAR = 0.37%) and 136 observations (CAR = 7.27%);
Lin et al. (2008)	JBFA	Taiwan	1996–2001	(–3, 0)	293	–0.4	***
Wang et al. (2008)	RPBFMP	Taiwan	1996–2006	(0, 1)	385	0.28	Calculated as the sum of day 0 (0.12%) and day 1 (0.157%)
Twu (2010)	RPBFMP	Taiwan	1985–2004	(–1, 0)	1018	–0.09	Calculated as the weighted average of two subsamples of 209 observations (CAR = 0.0396) and 809 observations (CAR = –0.1196)
Liang and Jang (2013)	QREF	Taiwan	2002–2008	(–3, 0)	302	1.42	***

Table 2 (*continued*)

Study	Journal	Country	Research period	Event window	Number of observations	CAR	Significance
Cheng et al. (2014)	RPBFMP	Taiwan	2003–2010	(0, 1)	221	0.88	***
Yeh et al. (2015)	RPBFMP	Taiwan	2002–2007	(–1, 1)	213	0.04	n.s.
International studies							
Fauver et al. (2017)	JCF	EU	1999–2012	(–1, 1)	1125	–1.4	***
Gropp et al. (2017)	SSRN	EU	2009–2013	(–1, 1)	79	–2.26	Calculated as the weighted average of two subsamples of 47 observations (CAR = –1.72%) and 32 observations (CAR = –3.06%).
Higgins et al. (2002)	FR	International	1992–1997	(0, 0)	162	–0.49	n.r.
Errunza and Miller (2003)	JBF	International	1981–1996	(–1, 1)	123	–0.68	n.r.
Massa et al. (2013)	SSRN	International	1995–2008	(–1, 1)	12,639	1.83	***
Massa et al. (2016)	SSRN	International	1995–2011	(–1, 1)	37,767	–0.77	Calculated as the weighted average of two subsamples of 22,016 observations (CAR = –1.02%) and 15,751 observations (CAR = –0.42%).
Dahiya et al. (2017)	JCF	International	2000–2009	(–1, 1)	2366	1.2	Calculated as the weighted average of two subsamples of 456 observations (CAR = 3.41%) and 1910 observations (CAR = 0.67%).
Li et al. (2017)	SSRN	International	2001–2012	(–1, 1)	1307	–0.74	***

n.s. = not significant on at least 10%-level; n.r. = significance is not reported by the authors. Holderness (2018) reported separate results for Australia and the US. *** significant at the 1%-level, ** significant at the 5%-level, * significant at the 10%-level (2-tail tests).

the case with most topics in finance, most of the papers are about the US (131 papers). However, there are also many studies on countries outside the US In total, 60 papers cover individual other countries such as the UK (9), China (7), Japan (6), Taiwan (6), France (5), Hong Kong (5), and Canada (3). Other countries are covered by one or two studies. Finally, eight studies have an international sample.

Most of the papers find significant negative abnormal returns. This result especially holds for the US However, some US studies find significant positive abnormal returns. For example, Hertzel and Smith (1993) find a significant CAR of 1.72% over the 4-day event window (–3,0). Outside the US, while most of the studies find negative abnormal returns, it is even more common that studies for the same country report contradictory results. For example, Tsangarakis (1996) finds a positive and significant abnormal return for Greece (3.97%), while Espenlaub et al. (2008) find a negative and significant abnormal return (–1.37%). Potential explanations for these differences include differences in sample periods, or differences in the characteristics of the offerings.

III. FACTORS EXPLAINING WEALTH EFFECTS OF SEOs

The empirical corporate finance literature studies many factors that are related to wealth effects associated with SEOs. To do a sensible econometric analysis, our meta-analysis only includes factors that are studied in at least three empirical studies. We briefly summarize these factors next.

A. Rights offerings

Although rights offerings are not as popular anymore in the US as in the UK., Australia, continental Europe, and Asia (e.g. Eckbo and Masulis 1992; Eckbo 2008), studies have shown that they do typically result in higher announcement effects than other SEOs, like firm commitment offerings. The wealth effects that most studies in the US find for rights offering announcements are negative, but relatively these effects are less negative than for other SEOs (Smith 1977; Eckbo and Masulis 1992; Eckbo 2008). One reason for the relatively good announcement effects is that rights offerings often have lower flotation costs (Hansen 1988). In addition, a standard firm commitment offering can redistribute voting rights and reduce monitoring, whereas there need not be a redistribution of voting rights in a rights offering. Still, as argued by Eckbo and Masulis (1992), if shareholders are expected to sell their rights, then information asymmetry and adverse selection costs become important, and returns could be substantially negative. Indeed, Holderness and Pontiff (2016) find more negative stock market reactions for bigger wealth transfers between participating and nonparticipating shareholders. Outside of the US, rights offerings can also result in substantially negative market reactions, for example in the UK (Slovin et al. 2000), the Netherlands (Kabir and Roosenboom 2003), Hong

Kong (Ching et al. 2006), and New Zealand (Marsden 2000). Still, heterogeneity remains, as Bigelli (1998), for example, finds positive wealth effects for rights issues in Italy. Our analysis can shed light on the overall distinguishing effect of rights issues on announcement returns, and we will separately examine the effects in the US, where rights offerings are scarcer.

B. Private issues

Many recent security issues are privately placed. In fact, Chen et al. (2010b) and Floros and Sapp (2012) show that the private placement market has surpassed the traditional seasoned equity market, both in terms of number of annual transactions and total annual issue volume. Issuing a security privately could have implications for announcement effects. Wruck (1989) argues that private placements are purchased by investors who are willing to actively monitor management, which could improve the efficiency of the firm, and would predict more positive announcement effects. Positive announcement effects may also follow from a certification hypothesis, in which informed investors certify the quality of the firm by buying a large fraction of stock in the private placement (Hertzel and Smith 1993). However, Barclay et al. (2007) argue that securities are mostly privately placed so that management can select so-called *friendly investors*, who are unlikely to oppose management. If entrenchment is the rationale for most private placements, then this is less likely to be welcomed by nonparticipating shareholders, and announcement effects are expected to be negative. Private placements are also typically issued with a substantial offering discount, which would also lead to negative price effects.

Empirically, most studies find positive announcement effects for privately placed security issues. More specifically, positive announcement effects for private placements in the US are reported by, for example, Wruck (1989), Hertzel and Smith (1993), and Barclay et al. (2007). Moreover, Ching et al. (2006) find positive effects in Hong Kong. We will examine whether our meta-analysis can indeed show that private placements are accompanied by significantly different abnormal returns than public placements, and we will again examine this effect separately for the US.

C. SEOs with warrants included

SEOs regularly include warrants, also known as unit offerings. A warrant allows an investor to purchase additional numbers of the underlying common stock at a fixed price, until the warrant expires. A reason for including a warrant could be related to sequential financing (Schultz 1993; Mayers 1998). In that rationale, warrant offerings provide opportunities for multistage financing settings in which agency costs are reduced, in that the latter stages of the project can only be financed when the firm performed well and the warrants will be exercised. Chemmanur and Fulghieri [1997] argue that warrants can be issued by high-quality firms to signal information. Consistent with information signaling, Byoun and Moore (2003) find that warrant issuing firms have relatively high managerial ownership. They predict that firms with warrants in their SEOs experience higher abnormal stock returns than if they had issued shares alone. Byoun (2004) reports less negative price reactions to unit offering announcements relative to stock offering announcements.

D. Asymmetric information

The pecking order model (Myers 1984; Myers and Majluf 1984) predicts that because of informational asymmetry between managers and shareholders, equity issues are perceived as bad news. That is, the market assumes that managers try to maximize the wealth of their existing shareholders and an equity issue signals that the new shareholders might pay too high a price. As such, an equity issue is predicted to be associated with a negative abnormal return. In a theory of market timing (Baker and Wurgler 2002), firms issue equity opportunistically when it is overpriced. Also, according to that theory, seasoned equity issues will be accompanied by negative announcement returns. The signal provided by an equity issue is especially relevant when informational asymmetry is large. As such, more negative announcement effects can be expected when a firm with high informational asymmetry announces to issue equity.

In this context a meta-analysis is useful as there is no consensus on how to empirically measure information asymmetries. Measures by earlier studies include firm size (Frank and Goyal 2003), economic conditions (Choe et al. 1993; Salamudin et al. 1999), levels of communication (Ang and Cheng 2011), quality of accruals (Lee and Masulis 2009), institutional ownership (Gao and Mahmudi 2008), and measures based on market microstructure (Bharath et al. 2009).

E. Insider trading

Several studies, starting with Lee (1997), study whether firms that had insiders trading shares before the SEO announcement were associated with lower abnormal returns. If companies issue overvalued stock, as argued by Myers and Majluf (1984), then managers might sell their own (overvalued) shares before an SEO. Clarke et al. (2004) find that US managers issuing equity sell their shares before the SEO announcement. Ching et al. (2006) study the same phenomenon for Hong Kong and find similar results. Gokkaya and Highfield (2014) revisit this topic for the US and find that SEO announcements are negatively related to trades by executive insiders but are unrelated to trades by nonexecutive insiders.

F. Financial companies and utilities

Smith (1986) notes that utilities are more likely to issue external capital than industrial companies, which perhaps means that for utilities issue announcements should have had less negative stock price reactions than for industrial companies. Financial companies face explicit capital adequacy regulations, which could also indicate that their equity issues should not lead to strong declines in share prices. In fact, Furlong and Keeley (1989) argue that by issuing additional common stock a financial institution reduces the incentive of bank managers to increase asset risk and increases the size of the cushion available to absorb losses. On the other hand, banks are also often considered opaque (Krishnan et al. 2010), which could lead to more negative announcement effects.

G. Dividend paying stocks

According to the free cash flow theory (Jensen 1986), particularly negative announcement effects can be expected when mature, dividend-paying firms issue new securities. For growth firms, that typically do not pay dividends, security issues are likely to be essential for their growth, whereas for mature firms there is the threat of overinvestment. On the other hand, it could be argued that dividend-paying firms have lower information asymmetry, which would result in more positive announcement effects than for nondividend-paying firms. Loderer and Mauer (1992) find empirically for a US sample that the market reacts more negatively for issues of dividend-paying firms. For a more recent period, however, Booth and Chang (2011) find more favorable announcement effects for dividend-paying firms.

H. SEOs following recent IPOs

One reason why IPOs might be underpriced, according to Aggarwal et al. (2002), is that owner–managers of IPO firms do not maximize the offering prices of IPOs, but rather strategically set low offering prices to be able to create momentum and sell more shares at higher prices through follow-on offerings. Zhang (2013) and Jiang et al. (2013) find that returns around follow-on offering announcements are more negative for newly public firms than older firms. Potential explanations include differences in information asymmetry, firms trying to take advantage of windows of opportunities, or that a follow-on offering after the IPO signals that the original owners want to exit after a potential lockup period.

I. Secondary shares SEOs

Asquith and Mullins (1986) argue that secondary offerings may be viewed by the market as unfavorable signals about a firm's current and future performance. Seasoned offerings of secondary shares may also signal that informed firm insiders are trying to sell their overpriced equity during the "window of opportunity". Based on these two effects, it can be expected that the market would react more negatively to the announcements of secondary offerings than to the announcements of primary offerings. While Lee (1997), Clarke et al. (2004), and Bradley and Yuan (2013) find that the market reaction to the SEO announcements is negative, they do not find significant differences in the market reactions between primary and secondary offerings.

J. Dual-class firm SEOs

Dual-class firms have two classes of stocks: publicly traded shares with one vote per share and nonpublicly traded shares with multiple votes per share. Smart et al. (2008) point out that signaling and agency theories predict different market reactions to single- and dual-class SEO announcements. The signaling theory predicts a more negative market reaction to single-class SEOs as those dilute voting rights at a faster rate. Therefore, they are more likely to signal overvaluation than SEOs of dual-class firms. The agency theory suggests that the more negative market reaction to dual-class SEOs can be explained by the larger differences between the interests of managers and shareholders following an SEO. Smart et al. (2008) find no significant difference in announcement returns between single- and dual-class firms. On the other hand, Gokkaya and Roskelley (2013) find less negative announcement returns for a sample of US dual-class firms.

K. Reasons for offering

Corporations can issue securities to finance capital expenditures, but also for refinancing purposes. In addition, securities can be issued for general corporate purposes, or even simply to time the market. These different reasons for obtaining financing could affect the announcement returns of the proposed issue. In well-governed firms, the market expects managers to invest in positive Net Present Value (NPV) projects. Walker and Yost (2008) find that seasoned equity issuers stating specific investment plans experience higher announcement returns. The market might perceive stated capital expenditure purposes as a credible signal of profitable investment opportunities. Refinancing debt with equity might not typically lead to the best announcement returns, as most firms are already underlevered and fail to fully exploit the tax shield provided by debt financing (Graham 2000).

L. Differences in corporate governance systems

We also consider country-specific characteristics. Our analysis incorporates studies from around the world, and circumstances differ across countries. Moerland (1995) proposes two categories of corporate systems that may have an impact on economic events: market-oriented systems and network-oriented systems. Market-oriented systems (also called Anglo-Saxon systems) have well-developed financial markets and active markets for corporate control, with many firms listed on stock exchanges. Countries with market-oriented systems include the US, UK, Canada, Australia, and New Zealand. Network-oriented systems typically have closely held corporations, including family ownership structures, state ownership, and group membership of corporations. Banks can be highly involved in decision-making in network-oriented systems. Countries included in the network-oriented systems are Germanic countries (Germany, Switzerland, Austria, and the Netherlands), Latinic countries (Italy, Spain, France, and Belgium), and Japan. Our meta-analysis will investigate whether differences in corporate governance systems are related to differences in abnormal returns. As an alternative corporate governance classification, we follow La Porta et al. (1997), who present a classification based on investor protection levels. Table II of their paper groups countries into high- and low-protection categories.

As a significant proportion of studies of the announcement effects of equity issues are based on the US data, we separately add a dummy variable indicating whether the analysis is based on US firms. In the end, our analysis allows us to examine the differences between the US, other market-oriented systems, and network-oriented systems. Given that corporate governance systems change over time, most notably after the accounting scandals in the early 2000s, we also include a post-2000 dummy.

M. Publication Bias

An interesting aspect of our study is that we can shed some light on whether there is a publication bias. Potentially, papers with stronger results are more likely to end up in the well-known journals. There could also be a quality bias but calculating wealth effects is not extremely complex and it is not obvious that poorly executed studies would systematically over- or underestimate wealth effects. We include dummy variables that identify studies published in one of the top four finance journals (*Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, and *Journal of Financial and Quantitative Analysis*) and in one of the top 38 finance journals. These are the 26 journals as identified by Heck and Cooley (2009) with the addition of *Accounting and Finance, Critical Finance Review, European Financial Management, International Review of Finance, International Review of Financial Analysis, Journal of International Financial Markets, Institutions and Money, Journal of International Money and Finance, European Journal of Finance, Journal of Business, Review of Asset Pricing Studies, Review of Corporate Finance Studies,* and *Review of Finance.*

IV. META-ANALYSIS MODEL

A. Meta-analysis

We use meta-analysis to review papers on wealth effects associated with SEOs. Traditionally, review papers in finance use a narrative literature review.[5] Meta-

5 See, for example, Eckbo et al. (2007) as well as other review papers in the book of Hansen et al. (2007).

analysis is an alternative for these narratives. Meta-analysis uses quantitative methods to summarize and analyze research literature. It treats a study as a unit of analysis and it is entirely based on quantitatively expressed study attributes and outcomes (Green and Hall 1984). An important advantage of meta-analysis is that it is possible to derive statistically strong conclusions from the collected empirical evidence. In addition, the results are more objective compared to narrative literature overviews.

B. Model

The input in our meta-analysis are the studies reviewed in Table 2 that measure the wealth effects associated with SEOs. These wealth effects are measured as abnormal returns using different methods that include mean adjusted returns, market adjusted returns, Capital Asset Pricing Model returns, matched or control portfolio returns, and market model returns.[6] The abnormal returns from previous studies are used as observations in a multifactor natural experiment, with the experimental factors corresponding to the factors hypothesized to influence wealth creation (Datta et al. 1992, p. 71).[7] The form of meta-analysis that we use is generally referred to as replication analysis.

The dependent variable is the abnormal return, as a proxy for wealth creation. Out of 199 studies, 77 studies reported CAR over a (–1, 1) event window, 54 studies used a (–1, 0) window, 37 studies used a (0, 1) window, 8 studies used a (0, 0) window, 1 study reported a (–2, 0) window, and the remaining studies reported event windows longer than 3 days. To capture differences that can be attributed to duration of event windows, we (i) do a robustness check by normalizing the reported CARs by dividing them by the number of days in the event window and (ii) introduce dummy variables for observations with different event windows.

The values of the dependent variable (CAR) and the independent variables in the regressions are based on the results of subsamples reported by the primary studies. The independent variables in the regressions are dummy variables that are coded based on the subsample separation criteria reported in individual studies. For example, a study may present abnormal returns for separate subsamples of rights issues and private issues. In this case, we would assign the variable *Rights issue* a value of one to the subsample of rights issues and a value of zero to the subsample of private issues. Conversely, we would assign a value of one for the variable *Private issue* for the subsample of private issues while for the subsample of rights issues the value of this variable would be set to zero. If another study did not report separate subsamples of rights and private issues,

6 In case a study uses more than one method to calculate abnormal returns, we only use the results for the more conventional method, that is, the market model. However, very few studies report results for more than one method.

7 Other studies that have used this type of analysis include Veld and Veld-Merkoulova (2009) for corporate spin-offs and Abdul Rahim et al. (2014) for convertible bond and warrant-bond offerings.

then the values of both *Rights issue* and *Private issue* for such a study would be set to zero. The possibility that there are actually some rights and private issues in the subsamples that are set to zero leads to the possibility of underestimating the effects of these variables and in general works against us in finding significant effects of the independent variables. The relation between dependent and independent variables can be described as:

$CAR_{t,s}$ = f(*Rights issue*$_s$, *U.S.*$_s$, *U.S.*Rights issue*$_s$, *Private issue*$_s$, *U.S.*Private issue*$_s$, *Warrants*$_s$, *Post 2000 sample*$_s$, *U.S.*Post 2000 sample*$_s$, *Low asymmetric information*$_s$, *Insider*$_s$, *Industrial Company*$_s$, *Financial Company*$_s$, *Dividend paying stock*$_s$, *SEO within 3 yrs of IPO*$_s$, *SEO for debt reduction*$_s$, *SEO for investment*$_s$, *Dual-class firm SEO*$_s$, *Secondary SEO*$_s$, *Network-oriented country*$_s$, *Medium and low investor protection*$_s$, *Top 4 journal*$_s$, *Top 38 journal*$_s$, *2-day event window*$_s$, *Event window other than 2-day or 3-day*$_s$)

where $CAR_{t,s}$ is short-run CAR reported in study *s* over *t* days; Different forms of SEO placement are *Rights issue*$_s$ is issue defined in the original paper as rights issue (1 = Yes)[8] and *Private issue*$_s$ issue is defined in the original paper as private issue (1 = Yes); Issuer characteristics are *Warrants*$_s$ issue is defined in the original paper as an equity issue that includes warrants (1 = Yes); *Post 2000 sample*$_s$ is study using issues from after the year 2000 (1 = Yes)[9]; *Low asymmetric information*$_s$ is issue by a company with a measure of low asymmetric information (1 = Yes)[10]; *Insider*$_s$ is issue with a presence of insider information and/or a high level of insider trading prior to the SEO announcement (1 = Yes); *Dividend paying stock*$_s$ is issue by a dividend-paying company (1 = Yes); *SEO within 3 yrs of IPO*$_s$ is SEO issued within 3-year period of IPO (1 = Yes); *Dual-class firms SEO*$_s$ is SEO issued by dual-class firm (1 = Yes); *Secondary SEOs*$_s$ is SEO with secondary shares offered (1 = Yes); Issuer types are *Industrial Company*$_s$ is industrial company (1 = Yes); *Financial Company*$_s$ is financial company (1 = Yes); Reasons for offering are *SEO for debt reduction*$_s$ are funds used for refunding old debt (1 = Yes); *SEO for investment*$_s$ are funds used for capital expenditures (1 = Yes);

8 UK open offers and UK placings are classified as nonrights issues; *Rights issue* dummy for these observations is set equal to zero.

9 Only studies or samples that start in the year 2000 or later are assigned a dummy variable of one. If a reported sample spans the year 2000, for example, 1997–2003, the dummy variable is set to zero. However, our results are robust if we classify the latter as post 2000 (i.e., if we assign a value of one for such studies and/or samples).

10 As mentioned in Section III.D, this variable is measured differently in individual studies. We have followed the original studies and we assign a value of one for *Low asymmetric information* following their specific proxy. For example, if a study defines a subsample with "high quality of accruals" as the "low asymmetric information" subsample, then we assign a value of one for the dummy variable. Similarly, if another study uses "high institutional ownership" subsample as the proxy for the low information asymmetry subsample, we assign a value of one for the dummy variable for that subsample. Therefore, the low information asymmetry dummy is based on different variables that proxy low levels of information asymmetry.

Differences in corporate governance systems are *Network oriented country*$_s$ is network-oriented economy as defined by Moerland (1995) (1 = Yes); *Medium and low protection*$_s$ is economy with medium or low level of investor rights protection as per La Porta et al. (1997) (1 = Yes); *U.S.*$_s$ is study on the US (1 = Yes); Publication bias are *Top 4 journal*$_s$ is study published in one of the top four finance journals, that is, *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies, Journal of Financial and Quantitative Analysis* (1 = Yes); *Top 38 journal*$_s$ is study published in one of the top 26 finance journals as defined by Heck and Cooley (2009) plus *Accounting and Finance*, *Critical Finance Review*, *European Financial Management*, *International Review of Finance*, *International Review of Financial Analysis*, *Journal of International Financial Markets, Institutions and Money*, *Journal of International Money and Finance*, *European Journal of Finance*, *Journal of Business*, *Review of Asset Pricing Studies*, *Review of Corporate Finance Studies*, and *Review of Finance* (formerly *European Finance Review*). Reported event windows are *2-day event window*$_s$ is study sample reports CAR over a 2-day event window (1 = Yes); and *Event window other than 2-day.or 3-day*$_s$ is study sample reports CAR over an event window that is neither 2-day or 3-day (1 = Yes).

V. RESULTS OF THE META-ANALYSIS

The 199 studies summarized in Table 2 provide the data for the meta-analysis. In our main models we use all subsamples that report a mean CAR for an event window containing the SEO announcement day. Many of these studies present separate subsamples involving analysis of at least one of the variables mentioned in Section III, leading to 861 (sub)samples that we can employ. The mean and median CARs from these 199 studies are included in Table 3.

The total number of SEO announcements within the 861 subsamples is 529,990. However, there is a large amount of double counting involved, because many studies present both results for the total sample and results for subsamples. After eliminating this double-counting, we are left with 275,103 observations. Even this number still includes substantial double counting, because the same observation for a specific SEO is likely to be included in multiple studies (this phenomenon especially occurs for observations in US studies).

The mean CAR across full samples of the 199 studies is –0.98%, and it is significantly different from zero at the 1% level. The mean CAR reported in the 161 journal articles is –0.86%, and the mean CAR reported in the 37 working papers is –1.51%; both are statistically different from zero at the 1% level. The difference between the two samples is significant at the 10% level. The proximity of the mean to the median (–1.39%) for all studies suggests that the results are not likely to be driven by outliers. The most negative abnormal return reported in a study is –12.82% and the most positive abnormal return is 21.1%. The Kruskall–Wallis test rejects the null hypothesis that the samples of CARs

Table 3 Cumulative abnormal returns around SEO announcements

	All studies	US studies	Non-US studies	Published papers	Working papers
Mean	–0.98	–1.48	–0.03	–0.86	–1.51
Standard deviation	2.71	1.83	3.71	2.86	1.87
t-statistics	–5.13	–9.25	–0.06	–3.85	–4.92
p-value of *t*-test of equal means (US versus Non-US, Published versus WP)			0.003		0.09
Median	–1.39	–1.86	–0.45	–1.18	–2
p-Value of the One-Sample Wilcoxon Signed Rank Test of median equal to zero	0	0	0.54	0	0
p-Value of Kruskal–Wallis test of equal medians (US versus Non-US, Published versus WP)			0		0.05
Minimum	–12.82	–7.85	–12.82	–12.82	–4.59
Maximum	21.1	4	21.1	21.1	4
Number of studies	199	131	68	162	37
Number of subsamples	861	551	310	643	218
Number of announcements within studies	275,103	197,578	77,525	170,583	104,520
Number of announcements within studies (double counted)	529,990	407,246	122,744	292,181	237,809

This table reports descriptive statistics for cumulative abnormal returns for both published and nonpublished studies on the effects of SEO announcements on stock prices for the period until December 31, 2017. The (sub)samples of studies include papers published in the top 26 Finance journals as specified by Heck and Cooley (2009) with the addition of papers published in *Accounting and Finance*, *Critical Finance Review*, *International Review of Finance*, *International Review of Financial Analysis*, *Journal of International Financial Markets, Institutions and Money*, *Journal of International Money and Finance*, *Journal of Business*, *Review of Corporate Finance Studies*, *Review of Asset Pricing Studies*, *Review of Finance* (*European Finance Review*), *European Financial Management*, and *European Journal of Finance,* as well as working papers that are included in the library of the Social Sciences Research Network (SSRN). *p*-Values are reported for the *t*-test of equal means, Wilcoxon Signed Rank Test of median equal to zero, and for the Kruskal–Wallis test of equal medians between US studies and non-US studies as well as studies published in journals and SSRN working papers.

reported in journal articles and working papers come from identical populations with 95% confidence.[11]

While the simple mean CAR may indicate the size of the reaction of the stock prices to the SEO announcements, it ignores different levels of precision employed in individual studies. The precision of the CARs reported in studies is manifested by their standard errors, which, in turn, are influenced by sample sizes. To account for the differences in sample sizes and reported standard

11 We checked for possible differences between studies that present 2-day, 3-day, and other event windows. The average CARs for studies reporting 2-day and 3-day windows are –1.41% (*t*-statistics = –5.49) and –0.88% (*t*-statistics = –2.46%) respectively. The average CAR for studies using other event windows is –0.13% (*t*-statistics = –0.35).

errors, we also employ the random-effect meta-analysis approach summarized in Borenstein et al. (2009). More specifically, we use the DerSimonian and Laird (1986) estimator to calculate the summary effect (i.e., weighted average CAR). The DerSimonian and Laird (1986) estimation uses standard errors of the CARs reported in individual studies for calculating the relative weight for each study. The reported summary effect is based on the analysis of CARs from the 96 studies that report standard errors for their CARs. Based on this methodology, the estimate of the CAR associated with the SEO announcement is equal to –1.08% (untabulated) and is statistically different from zero (z-statistic is equal to –7.66) with the 95% confidence interval ranging from –1.36% to –0.80%.

We continue our analysis with a meta-regression. While there are 861 subsamples reported in the primary studies, some studies report both full sample results and results for subsamples. To deal with the problem of double counting in our regression analysis we exclude 100 observations reporting full sample results if the full sample is entirely incorporated in the subsamples from our regressions. Furthermore, we exclude 16 subsamples from international studies to be able to examine how measures for institutions from individual countries affect the wealth effects. This procedure leaves us with 745 subsamples reporting CARs, 448 of which report t-statistics of CARs. To correct for potential correlation between results reported for the same country, we use Rogers (1993) clustered standard errors with country as a cluster as suggested by Petersen (2009). Table 4 shows the results.[12]

Panel A includes the results for all countries. All models are based on the mean CAR as the dependent variable. In Model 1, the coefficient for *Rights issue* is negative and significant at the 5% level. Hence, rights issues are associated with more negative announcement effects than other offerings, all else equal. Interestingly, the interaction term of *Rights issue* and *U.S.* has a positive coefficient that is significant at the 1% level, and the size of this coefficient suggests that rights issues in the US are associated with more positive announcement effects than public offerings. Right issues thus mostly reduce wealth effects outside the US. Strikingly, the isolated effect of the *U.S.* dummy is strongly negative. As such, public offerings in the US are associated with substantially more negative wealth effects than public offerings in other countries, all else equal. This result is in line with Table 2, where we can see that most US studies present negative abnormal returns, while the result for other countries is mixed. These findings highlight the heterogeneity across countries and imply that studying the institutional specifics of rights offerings can be important (Balachandran et al. 2008).

The effect of *Private issue* is positive and significant at the 1% level, which is in line with the results of individual studies on this effect as documented in

12 We perform two robustness checks. In the first robustness check, we use the CARs from the studies that use only a 2- or 3-day event window. In the second check, we perform a regression analysis only using studies reporting 2-day event windows. The findings from both robustness checks do not materially differ from the findings presented in this paper. Detailed results are available from the authors on request.

Table 4 Meta-analysis regression results using *CARs* as dependent variables

Dependent variable	Mean cumulative abnormal return							
Independent variable	Panel A: All studies				Panel B: US studies		Panel C: Non-US studies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rights issue	–1.95**	–1.96**	–1.82**	–2.09**	1.16***	1.05***	–1.89*	–2.12*
	(0.85)	(0.87)	(0.88)	(0.89)	(0.32)	(0.31)	(0.97)	(1.05)
U.S.*Rights issue	3.11***	3.13***	2.97***	3.08***				
	(0.85)	(0.88)	(0.88)	(0.87)				
Private issue	2.35***	2.35***	2.36***	2.40***	2.81***	2.85***	2.33***	2.42***
	(0.69)	(0.69)	(0.74)	(0.66)	(0.38)	(0.38)	(0.66)	(0.63)
U.S.*Private issue	0.48	0.47	0.48	0.48				
	(0.71)	(0.70)	(0.75)	(0.67)				
Warrants	0.57	0.57	0.64*	0.88**	0.88	1.04	0.43	0.89
	(0.39)	(0.40)	(0.33)	(0.42)	(0.86)	(0.85)	(0.85)	(1.02)
Post 2000 sample	–0.94	–0.98	–0.95	–0.85	0.25	0.36	–1.02	–0.87
	(1.26)	(1.26)	(1.23)	(1.26)	(0.67)	(0.67)	(1.30)	(1.28)
U.S.*Post 2000 sample	1.23	1.27	1.22	1.34				
	(1.29)	(1.29)	(1.27)	(1.32)				
Low asymmetric information	–0.26	–0.27	–0.26	–0.26	–0.30	–0.33	0.36	0.61
	(0.16)	(0.16)	(0.16)	(0.19)	(0.25)	(0.24)	(0.71)	(0.86)
Insider	–1.21	–1.24	–1.18	–1.26	–0.52**	–0.76**	–1.88	–1.73
	(0.96)	(0.97)	(0.84)	(0.92)	(0.23)	(0.32)	(1.31)	(1.47)
Industrial company	–0.45**	–0.46***	–0.41**	–0.43*	–0.59***	–0.62***	–0.44	0.17
	(0.16)	(0.16)	(0.18)	(0.25)	(0.22)	(0.21)	(0.80)	(0.88)
Financial company	0.19	0.18	0.18	0.36	0.10	0.24	–0.33	–0.61
	(0.25)	(0.25)	(0.23)	(0.27)	(0.25)	(0.25)	(1.03)	(0.88)
Dividend paying stock	0.20**	0.20**	0.14	0.49***	0.22	0.37	–0.30	0.12

Table 4 (*continued*)

Dependent variable	Mean cumulative abnormal return							
Independent variable	Panel A: All studies				Panel B: US studies		Panel C: Non-US studies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(0.09)	(0.09)	(0.12)	(0.15)	(0.31)	(0.31)	(0.73)	(0.64)
SEO within 3 years of IPO	–0.62***	–0.62***	–0.59***	–0.53***	–0.57	–0.52		
	(0.05)	(0.05)	(0.04)	(0.05)	(0.36)	(0.36)		
SEO for debt reduction	–0.77*	–0.80*	–0.57	–0.85**	–2.49***	–2.31***	–0.48**	–0.68***
	(0.44)	(0.43)	(0.41)	(0.36)	(0.15)	(0.16)	(0.19)	(0.21)
SEO for investment	0.83	0.80	0.99	0.81	–0.03	0.15	1.12	0.92
	(0.68)	(0.67)	(0.61)	(0.58)	(0.22)	(0.23)	(0.66)	(0.59)
Dual-class firm SEO	–0.08	–0.08	–0.05	0.01	0.03	0.08		
	(0.13)	(0.14)	(0.13)	(0.13)	(0.35)	(0.32)		
Secondary share SEO	–1.05***	–1.05***	–1.07***	–1.11***	–0.97***	–1.00***		
	(0.12)	(0.12)	(0.13)	(0.13)	(0.31)	(0.34)		
U.S.	–2.00***	–2.05***	–1.68**	–2.02***				
	(0.48)	(0.53)	(0.69)	(0.46)				
Network-oriented country		–0.16						
		(0.39)						
High investor protection			–0.57					
			(0.47)					
Top four journal				0.83***		0.52**		1.33**
				(0.27)		(0.23)		(0.54)
Top 38 journal	0.49*	0.48*	0.54*	0.28	0.27	0.15	0.74	0.42
	(0.28)	(0.27)	(0.31)	(0.28)	(0.21)	(0.21)	(1.07)	(1.10)
Two-day event window	–0.30	–0.30	–0.28	–0.41	–0.05	–0.09	–0.86**	–1.12***
	(0.24)	(0.24)	(0.22)	(0.29)	(0.18)	(0.18)	(0.36)	(0.33)
Event window other than 2 days or 3 days	0.65**	0.66**	0.61**	0.78***	1.04***	1.06***	0.15	0.50
	(0.26)	(0.26)	(0.29)	(0.21)	(0.22)	(0.22)	(0.46)	(0.43)

Table 4 (*continued*)

Dependent variable	Mean cumulative abnormal return							
Independent variable	Panel A: All studies				Panel B: US studies		Panel C: Non-US studies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	–0.07	–0.01	0.14	–0.07	–2.11***	–2.12***	0.16	0.16
	(0.61)	(0.65)	(0.61)	(0.61)	(0.17)	(0.17)	(1.28)	(1.34)
Number of observations	745	745	745	745	475	475	270	270
R^2	0.25	0.25	0.26	0.27	0.30	0.31	0.20	0.22

The dependent variables in these models are Cumulative Abnormal Returns (CARs) associated with the SEO announcements. Panel A reports the results from all studies, Panel B reports the results from US studies only, and Panel C reports the results of non-US studies. The independent variables are: *Rights issue* (=1 for rights issues, =0 otherwise), *Private issue* (=1 for private issues, =0 otherwise), *Warrants* (=1 for combined shares and warrants issues, =0 otherwise), *Post 2000 sample* (=1 for equity issues after 2000; =0 otherwise), *Low asymmetric information* (=1 for companies with low asymmetric information, =0 otherwise), *Insider* (=1 for issues with a presence of insider information, =0 otherwise), *Industrial Company* (=1 for industrial companies, =0 otherwise), *Financial Company* (=1 for financial companies, =0 otherwise), *Dividend paying stock* (=1 for dividend-paying stocks, =0 otherwise), *SEO within 3 years of IPO* (=1 for SEOs announced within 3 years of IPO, =0 otherwise), *SEO for debt reduction* (=1 for SEOs used to reduce company debt, =0 otherwise), *SEO for Investment* (=1 for SEOs used to finance new investments, =0 otherwise), other SEO reasons are used as the base case; *Dual-class SEO* (=1 for companies with dual-class share structure, =0 otherwise); *Secondary SEO* (=1 for SEOs where secondary shares are sold, =0 otherwise); *Network-oriented country* (=1 for studies using data from network-oriented countries, =0 otherwise), *Medium and Low investor protection* (=1 if study is using data from country with medium or low investor protection level as described in La Porta et al. (1997), =0 otherwise; countries with high level of protection are used as benchmark); *US* (= 1 for studies based on data from US, =0 otherwise), *Top four journal* (=1 for studies published in top four Finance journals, i.e., *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, *Journal of Financial and Quantitative Analysis*, = 0 otherwise), *Top 38 journal* (= 1 for studies published in Top 26 journals as specified in Heck and Cooley (2009) plus *Accounting and Finance, Critical Finance Review, European Financial Management, International Review of Finance, International Review of Financial Analysis, Journal of International Financial Markets, Institutions and Money, Journal of International Money and Finance, European Journal of Finance, Journal of Business\, Review of Asset Pricing Studies, Review of Corporate Finance Studies, and Review of Finance,* = 0 otherwise). *2-day* (= 1 for study samples that report 2-day event window around the announcement date, = 0 otherwise), *Event window other than 2-day or 3-day* (= 1 for study samples that report event windows other than 2-day or 3-day windows around the announcement day, =0 otherwise). Robust standard errors are reported in parentheses. Models are OLS regressions with Rogers (1993) clustered errors with countries used as clusters.
*** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level (two-tail tests).

Section III.B. The effect does not seem to be driven by US studies, since the interaction term for *Private issue* and *U.S.* is not statistically significant. We do not find a significant effect for the *Post 2000 sample*. Contrary to predictions of the pecking order theory, the coefficient for *Low asymmetric information* is not significant. Similarly, the result for *Insider* is not significant.

In Model 1, SEOs by industrial companies seem to be associated with significantly different abnormal returns from SEOs by utilities in the sense that industrial companies are associated with more negative abnormal returns. This result is in line with the reasoning of Smith (1986) who argues that utilities have more need for external capital and therefore their security issuance announcements are likely to be associated with less negative abnormal returns.

The coefficient for *SEO within 3 yrs of IPO* is significantly negative at the 1% level. We find that if a SEO is used to pay back debt, the announcement return is more negative. This result is consistent with firms leaving money on the table by not fully exploiting the debt tax shield (Graham 2000). An alternative explanation, suggested by Hertzel and Li (2010), is that SEOs that are used to decrease long-term debt can often be contributed to overvaluation. There is no significant effect if the SEO is used for investment purposes. The coefficient for *Secondary share SEO* is negative and is significant at the 1% level. This result is in line with the reasoning of Asquith and Mullins (1986) that secondary offerings may be viewed by the market as unfavorable signals about the current and future performance of the company that makes the announcement.

Finally, we find that if the paper is published in a top 38 journal, the abnormal return is more positive. However, this coefficient is only significant at the 10% level. This result is slightly different from the finding in Table 3 where we also did not find a significant difference between CARs reported in published papers and SSRN working papers.

In Model 2 we add the variable *Network-oriented country*. This variable is not significant. The coefficients of the other variables largely remain the same. Importantly, none of the significance levels changes.

Model 3 is the same as Model 2 except that the variable for *Network-oriented country* is replaced by *High investor protection*. The coefficient for this variable, which is based on country classification by La Porta et al. (1997), is not significant. The coefficients of the other variables do not change much compared to Model 2. There are some minor changes between the significance levels of different variables. The major exceptions are the fact that the variable for *Warrants* is now significantly positive at the 10% level, and that the variables for *Dividend paying stock* and *SEO for debt reduction* are no longer significant.

Model 4 is the same as Model 1, except that we add a second variable for the publication bias by adding *Top 4 journal* to the model. This variable is significantly positive at the 1% level. This result suggests that, on average, CARs reported in papers published in top four journals are statistically different from CARs reported in papers published in other journals and in working papers. All four models provide good explanatory power, with the adjusted R^2 being at least 25%.

Given the dominance of US studies in our sample, we also separately present results for the US studies. These results are included in Panel B of Table 4. As can be predicted from the results for the interaction term between *Rights issue* and *U.S.* in Panel A, the *Rights issue* variable is significant in Model 5 of Panel B. The coefficient for *Private issue* is significantly positive, in line with the results for the entire sample in Models 1–4. *Insider* is now significantly negative, which is in line with what one would expect: if insiders trade before the SEO announcement, the wealth effects will be lower. The coefficients for *Industrial Company* and *SEO for debt reduction* are the same as in Model 1, but they are now all significant at the 1% level. The variables for *Dividend paying stock* and *SEO within 3 yrs of IPO* were significant in Model 1 for the entire sample, but they are not significant for the US studies.

Model 6 is the same as Model 5, except that we add a variable for publication bias (*Top 4 journal).* In line with the total sample (see Model 4), this variable is significantly positive, indicating that there may be a publication bias for papers on the US published in top four journals. The significance levels of the other coefficients remain the same between Models 5 and 6.

Panel C includes the results for the non-US studies. Given the results of Panels A and B, the results for Panel C are not surprising. For example, *Rights issue* has a significantly negative coefficient. The variables *Industrial Company* and *Dividend paying stock* that were significant in Model 1 are no longer significant. Given the heterogeneity in the results of the countries outside the US, it is probably difficult to find systematic patterns for these countries. Model 8 again adds another variable for publication bias (*Top 4 journal).* This variable is significantly positive as in Models 4 and 6, but adding this variable does not change any of the coefficients compared to Model 7.

A potential limitation with our analysis is that we use different windows, that is, 2 days, 3 days, and other windows, for the dependent variable. We try to alleviate this concern in Table 4 by adding control variables for *2-day event window* and for *Event window other than 2-day or 3-day*. These variables are meant to control for the effect of having different event windows.[13]

A meta-analysis depends on the reliability of the CARs reported in earlier studies. As indicated before, the reliability of these CARs depends on the sample sizes of the original studies. The sample size of the studies that we include varies considerably. The largest study included in the analysis in Table 4 contains 7720 observations (Intintoli and Kahle 2010) and the smallest study only contains 19 observations (Wansley and Dhillon 1989).[14] Also, the variability of the

13 We also ran a separate regression in which we use daily average CARs as the dependent variables. In these regressions we divide the CARs by the number of days in the event window. The results from these regressions are largely the same as the results in Table 4. Differences are mainly in minor changes in significance levels. These results are available on request from the authors.

14 The study of Massa et al. (2013) in Table 2 contains more observations (12,639) than the study of Intintoli and Kahle (2010), but international studies are not included in the meta-regressions reported in Tables 4 and 5.

mean CARs varies substantially between different studies that cover different time periods and countries. Following Nelson and Kennedy (2009), Abdul Rahim et al. (2014) suggest an alternative measure that considers reliability. They use the *t*-statistics (or *z*-statistics) derived from each study's mean CAR and its standard error instead of abnormal returns. This approach solves the problem of heteroskedasticity of effect-size variances. Following this methodology, we use *t*-statistics as an alternative proxy for wealth effects using all subsamples for which the measure can be derived but ignoring subsamples from international studies and full sample data if it is fully incorporated in subsamples. This restriction reduces the sample size to 448 observations. The results of this analysis are included in Table 5.

The most important results of Panel A of Table 4 are also found in Panel A of Table 5. For example, the *Rights issue* coefficient is now only significant at the 10% level (in three out of the four model specifications), but the interaction term between this variable and US (*US*Rights issue*) is again positive and significant at the 1% level. Panels B and C confirm this result, because *Rights issue* is both positive and significant for the US and negative and significant for the non-US studies. The coefficient for *Private issue* is again significant (in two out of the four model specifications), but now the interaction term with US is also significantly positive. This result is confirmed in Panel B where the coefficient is significantly positive at the 1% level for the US results. The *Warrants* variable is significant for the entire sample in all four model specifications. Given that it is also positive and significant for the US-sample (at the 1% level), it is reasonable to assume that this result is driven by the US studies.

The coefficient for *Post 2000 sample* is not significant for the entire sample. This result is in line with Table 4. However, it is now positive and significant for the US subsample (see Models 5 and 6). Also, the interaction term between *U.S.* and *Post 2000 sample* is now positive and significant at the 1% level. This finding means that US studies show less negative abnormal returns from the year 2000. It also highlights the relevance of changes over time, and suggests the importance of macro-economic variables (Choe et al. 1993).

In line with Table 4, the variable for *Insider* is still not significant. However, when we look at the US subsample, we see that the coefficient for this variable changes from negative and significant in Table 4 to positive and significant in Table 5, but only for one of the two models. This result is surprising, because we would have expected it to be negative based on the review of the previous studies. In Table 5 *Insider* is significantly negative outside the US. This result is more in line with our *a priori* expectations.

In line with Table 4 the coefficient for *Industrial Company* is negative and significant. The coefficient for *Financial Company* was not significant in all eight specifications in Table 4. However, this coefficient is positive and significant at the 5% level in Table 5 for the sample of all studies (Models 1 to 4). This variable is also positive and significant for the US subsample. The significantly positive coefficient for this variable is in line with a study by Li et al. (2016), who

Table 5 Meta-analysis regression results using *t*-statistics as dependent variables

Dependent variable	*t*-Statistics of cumulative abnormal return							
Independent variable	Panel A: All studies				Panel B: US studies		Panel C: Non-US studies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rights issue	–4.07*	–4.15*	–3.99	–4.53*	6.43***	5.51***	–5.03**	–5.23**
	(2.26)	(2.26)	(2.39)	(2.45)	(1.55)	(1.45)	(2.14)	(2.39)
U.S.*Rights issue	9.89***	9.98***	9.82***	9.81***				
	(2.22)	(2.23)	(2.35)	(2.37)				
Private issue	1.76	1.78*	1.74	2.06*	6.30***	6.89***	0.75	0.94
	(1.04)	(1.00)	(1.07)	(1.04)	(0.79)	(0.88)	(0.73)	(0.73)
U.S.*Private issue	4.99***	4.94***	5.03***	5.13***				
	(1.11)	(1.05)	(1.16)	(1.05)				
Warrants	2.74**	2.73**	2.77**	3.99**	5.20***	6.60***	2.41	2.94
	(1.18)	(1.20)	(1.13)	(1.62)	(1.16)	(1.45)	(1.82)	(2.41)
Post 2000 sample	–0.42	–0.55	–0.39	0.27	3.26*	3.84**	0.29	0.72
	(0.64)	(0.64)	(0.62)	(0.82)	(1.70)	(1.71)	(0.70)	(0.93)
U.S.*Post 2000 sample	2.73***	2.86***	2.65***	2.64**				
	(0.94)	(0.91)	(0.91)	(0.93)				
Low asymmetric information	–1.16	–1.23	–1.22	–1.36	0.94	–0.85	–0.64	–0.22
	(1.34)	(1.36)	(1.39)	(1.32)	(3.43)	(3.41)	(2.03)	(2.44)
Insider	–0.55	–0.63	–0.47	–0.92	4.45**	2.71	–3.07**	–2.92*
	(2.65)	(2.71)	(2.57)	(2.02)	(1.94)	(1.91)	(1.43)	(1.47)
Industrial company	–4.13***	–4.15***	–4.12***	–4.27***	–4.08***	–4.26***		
	(0.21)	(0.21)	(0.23)	(0.21)	(1.42)	(1.33)		
Financial company	2.04**	2.06**	2.00**	2.39**	2.68*	3.74**	3.40*	2.85
	(0.79)	(0.79)	(0.75)	(1.06)	(1.58)	(1.59)	(1.94)	(1.84)
Dividend paying stock	3.33***	3.31***	3.29***	4.36***	4.91***	5.95***	–0.45	0.04
	(1.02)	(1.03)	(1.05)	(1.11)	(1.10)	(1.27)	(1.61)	(1.65)

Table 5 (*continued*)

Dependent variable	*t*-Statistics of cumulative abnormal return							
Independent variable	Panel A: All studies				Panel B: US studies		Panel C: Non-US studies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SEO within 3 years of IPO	−1.63***	−1.62***	−1.62***	−0.99***	−1.30	−0.53		
	(0.23)	(0.24)	(0.23)	(0.30)	(1.44)	(1.35)		
SEO for debt reduction	0.97	0.88	1.07	1.00	8.77***	10.17***	−1.12	−1.20*
	(1.78)	(1.81)	(1.80)	(1.99)	(1.16)	(1.45)	(0.67)	(0.60)
SEO for investment	4.11***	4.02***	4.21***	4.14***	8.65***	10.05***	2.67**	2.59**
	(1.24)	(1.26)	(1.19)	(1.34)	(1.16)	(1.45)	(1.26)	(1.15)
Dual-class firm SEO	4.68***	4.63***	4.71***	4.82***	4.01***	4.21***		
	(0.66)	(0.65)	(0.70)	(0.64)	(0.94)	(0.95)		
Secondary share SEO	5.44***	5.44***	5.43***	4.68***	6.74**	5.59**		
	(0.62)	(0.61)	(0.63)	(0.47)	(3.17)	(2.83)		
U.S.	−7.32***	−7.47***	−7.16***	−7.41***				
	(0.94)	(1.00)	(1.20)	(0.88)				
Network-oriented country		−0.53						
		(0.82)						
High investor protection			−0.32					
			(0.80)					
Top four journal				2.51***		3.15**		1.44
				(0.64)		(1.23)		(1.34)
Top 38 journal	0.81	0.77	0.84	−0.11	−0.50	−1.57	2.98	2.40
	(1.01)	(1.00)	(1.04)	(1.12)	(1.06)	(1.18)	(1.99)	(1.93)
Two-day event window	−0.96**	−0.98**	−0.94**	−1.19***	−1.79*	−1.92*	−0.13	−0.30
	(0.41)	(0.39)	(0.43)	(0.39)	(1.00)	(0.99)	(0.71)	(0.77)
Event window other than 2-day or 3-day	2.32**	2.32**	2.29**	2.82***	4.43***	4.62***	0.54	1.00
	(1.02)	(1.01)	(1.04)	(0.94)	(1.13)	(1.13)	(0.86)	(0.97)

Table 5 (*continued*)

Dependent variable	*t*-Statistics of cumulative abnormal return							
Independent variable	Panel A: All studies				Panel B: US studies		Panel C: Non-US studies	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	−0.14	0.06	−0.01	−0.20	−6.79***	−6.99***	−1.56	−1.59
	(1.19)	(1.28)	(1.17)	(1.27)	(0.94)	(0.95)	(1.94)	(2.00)
Number of observations	448	448	448	448	253	253	195	195
R^2	0.30	0.30	0.30	0.32	0.25	0.28	0.24	0.26

The *dependent variables* in these regressions are *t*-statistics reported for the Cumulative Abnormal Returns (CARs) associated with the SEO announcements. Panel A reports the results from all studies, Panel B reports the results from US studies only, and Panel C reports the results of non-US studies. Heteroskedasticity consistent errors based on studies reporting *t*-statistics of event window mean CARs. The independent variables are: *Rights issue* (=1 for rights issues, =0 otherwise), *Private issue* (=1 for private issues, =0 otherwise), *Warrants* (=1 for combined shares and warrants issues, =0 otherwise), *Post 2000 sample* (=1 for equity issues after 2000; =0 otherwise), *Low asymmetric information* (=1 for companies with low asymmetric information, =0 otherwise),), *Insider* (=1 for issue with a presence of insider information, =0 otherwise), *Industrial Company* (=1 for industrial companies, =0 otherwise), *Financial Company* (=1 for financial companies, =0 otherwise), *Dividend paying stock* (=1 for dividend-paying stocks, =0 otherwise), *SEO within 3 years of IPO* (=1 for SEOs announced within 3 years of IPO, =0 otherwise), *SEO for debt reduction* (=1 for SEOs used to reduce company debt, =0 otherwise), *SEO for Investment* (=1 for SEOs used to finance new investments, =0 otherwise), other SEO reasons are used as the base case; *Dual-class SEO* (=1 for companies with dual-class share structure, =0 otherwise); *Secondary SEO* (=1 for SEOs where secondary shares are sold, =0 otherwise); *Network-oriented country* (=1 for studies using data from network-oriented countries, =0 otherwise), *Medium and low investor protection* (=1 if study is using data from country with medium or low investor protection level as described in La Porta et al. (1997), =0 otherwise; countries with high level of protection are used as benchmark); *US* (=1 for studies based on data from US, =0 otherwise), *Top four journal* (=1 for studies published in Top four Finance journals, i.e., *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, *Journal of Financial and Quantitative Analysis*, =0 otherwise), *Top 38 journal* (=1 for studies published in Top 26 as specified in Heck and Cooley (2009) plus *Accounting and Finance, Critical Finance Review, European Financial Management, International Review of Finance, International Review of Financial Analysis, Journal of International Financial Markets, Institutions and Money, Journal of International Money and Finance, European Journal of Finance, Journal of Business, Review of Asset Pricing Studies, Review of Corporate Finance Studies, and Review of Finance,* =0 otherwise). *2-day* (= 1 for study samples that report 2-day event window around the announcement date, = 0 otherwise), *Event window other than 2-day or 3-day* (=1 for study samples that report event windows other than 2-day or 3-day windows around the announcement day, =0 otherwise). Robust standard errors are reported in parentheses. Models are OLS regressions with Rogers (1993) clustered errors with clusters based on the countries. *** Significant at the 1% level, ** significant at the 5% level, * significant at the 10% level (two-tail tests).

find that *convertible bond* offers by commercial banks are associated with higher abnormal returns than convertible bond issues by other companies.

The differences between Tables 4 and 5 highlight the potential relevance of how to control for sample sizes. Also, the differences between the tables may be driven by differences in standard errors across countries and sample periods. The coefficient for *U.S.* is still negative and significant at the 1% level for all models.

A further important difference between Tables 4 and 5 is in the coefficient for *SEO for debt reduction*. The coefficient for this variable is negative and significant for the US sample in Table 4 and is positive and significant at the 1% level in Table 5. *SEO for investment* is not significant in Panel A of Table 4, but is positive and significant at the 1% level in all specifications in Table 5.

A note of caution is in place for the results in Table 5. Given that we only have *t*-statistics for 448 out of the original 745 observations, the results in Table 5 might be less representative than those in Table 4.

VI. DISCUSSION OF THE RESULTS, CONCLUSIONS, AND FUTURE RESEARCH DIRECTIONS

This paper presents the results from a meta-analysis of 861 subsamples from 162 studies of wealth effects of SEOs published in a list of 38 influential finance journals and from 37 working papers on SEO wealth effects retrieved from SSRN. Several interesting findings emerge from our study. We find that seasoned equity issues by US companies are associated with lower abnormal returns than offers in other countries. US rights issues are associated with less negative abnormal returns, but rights issues outside the US are associated with more negative abnormal returns. Private placements are associated with a less negative market reaction. Other important determinants of SEO wealth effects include whether the issuer pays dividends, and the stated uses of proceeds of the offerings. Abnormal returns in studies published in the top four journals are less negative than those in other publications, all else equal.

Even though the topic of abnormal returns associated with seasoned equity issues has been studied in detail, there is still more work to be done. For one thing, this topic confirms the home bias that Karolyi (2016) documented. This bias refers to the fact that, even after considering the size of the US stock market compared to other markets, there is a disproportional number of studies based on US data. We find 199 studies on announcement effects associated with SEOs of which no less than 131 are on the US. Therefore, there seems to be a case to study other markets in more detail as well.

Related to the first topic, it would be interesting to study which factors drive the differences between the results for the US and other countries. To some extent they can be explained by corporate governance differences, but it is also possible that other factors play a role. Third, the finding that the interaction term for *Rights issue* and a *U.S.* dummy is positive is puzzling in the sense that at the same time we witness an almost complete disappearance of rights issues in the US. The puzzle gets even bigger if we consider the fact that the direct issuance costs of rights issues are smaller than those of other ways to place equity issues.

Fourth, we do not find overall significance for differences in information asymmetry, while this factor is important in both the pecking order and the market timing models, which are two of the most-often cited theories on SEOs. Perhaps, the fact that information asymmetry is measured using different variables plays a role here. A more systematic study on the relation between seasoned equity offer announcements and various information asymmetry estimates would clarify this topic. Such a study could determine whether the previously used measures for information asymmetry really measure differences in information or whether they also capture other company characteristics.

Finally, some factors show up as significant in our meta-analysis, but they have not been researched extensively. An example is the relevance of the stated use of proceeds. Our results suggest that a further examination of these factors could lead to an even better understanding of the cost of issuing equity.[15]

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15 The reference list is up-to-date per December 31, 2017. It is possible that in the meantime some forthcoming papers have appeared in print and/or that some working papers have been accepted for publication. However, to keep a one-to-one correspondence between Table 2 and the reference list, we have not updated the references after December 31, 2017.

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