RFS Advance Access published July 29, 2015

The Sovereign Wealth Fund Discount: Evidence from Public Equity Investments

Bernardo Bortolotti
Università di Torino
Sovereign Investment Lab, Baffi CAREFIN Centre, Bocconi University

Veljko Fotak
University at Buffalo
Sovereign Investment Lab, Baffi CAREFIN Centre, Bocconi University

William L. Megginson
University of Oklahoma
Visiting Professor, Université Paris Dauphine

We document that announcement-period abnormal returns of sovereign wealth fund (SWF) equity investments in publicly traded firms are positive but lower than those of comparable private investments. Further, SWF investment targets suffer from declining return on assets and sales growth over the following three years. Our results are robust to controls for target and deal characteristics and are not driven by SWF target selection criteria. Larger discounts are associated with SWFs taking seats on boards of directors and with SWFs under strict government control acquiring greater stakes, supporting the hypothesis that political influence negatively affects firm value and performance. (*JEL* G32, G15, G38)

We thank Geert Bekaert (the editor) and two anonymous referees for their valuable feedback. We thank Kate Holland, Laura Pellizzola, Valentina Milella, Armando Rungi, Giacomo Loss, and Timothée Waxin for research assistance with this project. We also benefitted from comments offered by George Allayanis, Wolfgang Bessler, Cecilia Chen, Mihaljek Dubravko, John Earle, Espen Eckbo, Oral Erdogan, Mara Faccio, Joseph Fan, Chitru Fernardo, Igor Filatotchev, Nuno Fernandes, Edith Ginglinger, Andrea Goldstein, Peter Hahn, Cam Harvey, Ron Jarmin, Stefanie Kleimeier, Kai Li, Donato Masciandaro, Anthony May, Meijun Qian, Vikas Raman, Vanessa Rossi, Andrew Rozanov, Karl Sauvant, Koen Schoors, Myron Slovin, Paola Subacchi, Georges Sudarskis, Marie Sushka, Vahap Uysal, Paul Wachtel, and Pradeep Yadav. The current version of this study has benefitted from comments offered by participants in the 2013 ECCE-USM Financial Globalization and Sustainable Finance conference at the Stellenbosch Business School, Cape Town, South Africa (keynote speech), the Sovereign Investment Lab's workshop on Sovereign Wealth Funds, Long-Term Investment, and Growth: Unlocking Potential (Venice; June 2013), and the Université Paris Dauphine (June 2013). We also appreciate suggestions offered on a predecessor version of this paper by participants in the Fulbright Tocqueville Distinguished Chair lecture (Université Paris-Dauphine; March 2008), the Comparative Analysis of Enterprise Data 2008 conference (Budapest), the 2008 Financial Management Association European meeting (Prague), the 2008 Barbarians at the Gate conference at Cass Business School (London), the University of British Columbia 2008 Summer Corporate Finance conference, the Chatham House International Economics Research Workshop (London; December 2008), the 2008 Australasian Finance and Banking Conference (Sydney), the 2009 Conference of the Autorité des Marches Financiers Scientific Advisory Board (Paris), the 8th Annual Darden International Finance Conference (Singapore; May 2009), the 15th Dubrovnik Economic Conference (June 2009), the 2009 European Finance Association meeting (Bergen), the Post-Crisis Era and the Expanding Role of the State conference at the Korea Advanced Institute of Science and Technology (Seoul; November 2009) and seminar participants at the Chinese University of Hong Kong, the University of Maastricht, the Ludwig-Maximilians-Universität München, the University of Southern Mississippi, HEC-Montreal (Quebec), the University of Oklahoma, the Fondazione Eni Enrico Mattei (FEEM, Milan), Saudi Aramco, and King Fahd University of Petroleum and Minerals. This work was supported by the Fulbright Commission, the Center for Financial Studies at the University of Oklahoma's Price College of Business, the Sovereign Investment Lab at Università Bocconi, the University at Buffalo, and the Saudi Aramco Chair in Finance, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Send correspondence to William L. Megginson, Price College of Business, The University of Oklahoma, 307 West Brooks, 205A Adams Hall, Noman, OK 73019-4005; telephone: (405) 325-2058. E-mail: wmegginson@ou.edu.

doi:10.1093/rfs/hhv036

The past fifteen years have seen a resurgence of government ownership of firms. In contrast to the old model of state-led entrepreneurship, in which the state owned and ran companies by ministerial *diktat*, today the most important government stock buyers tend to act primarily or solely as investors. Megginson and Fotak (2014) report that over the 2001–2012 period governments acquired more assets through stock purchases ($1.52 trillion) than they sold through share issue privatizations and direct sales ($1.48 trillion), testifying both to the growing role of governments in the economy, despite multiple worldwide privatization waves, and to the changing nature of government involvement. Among state-owned investors, sovereign wealth funds (SWFs) play an especially prominent role, with investable assets estimated at over $4 trillion and growing faster than any other institutional investor group. The rapid rise of SWFs begs a question: can state-sponsored funds, such as SWFs, ever act as objective, commercially driven long-term global investors, managing their nation's wealth as investment fiduciaries of their citizens? Our paper addresses this issue by studying the impact of SWF investment on firm value.

By some measures, SWFs have already been extensively researched. Yet extant empirical research offers incomplete evidence about the impact of SWF investments on the value of publicly traded companies. Studies that examine SWF investments using event-study techniques (Dewenter, Han, and Malatesta 2010; Kotter and Lel 2011) find positive announcement-period returns. Unfortunately, these results offer little insight into the role of SWFs as investors, as corporate finance research consistently documents positive announcement-period abnormal returns for all types of direct stock purchases by institutional investors.[1] In addition, the debate on the impact of SWFs on firm value is far from settled: Knill, Lee, and Mauck (2012) find evidence of SWFs not providing the same monitoring benefits as other institutional investors. To determine how the identity of the investing SWF impacts target firm value, we develop and test hypotheses comparing SWF stock purchases to those made by private financial investors and then explain the differential impact, while accounting for differences in target selection and investment characteristics.

On the one hand, SWFs have the capability and incentives to monitor portfolio firm managers and increase firm value by engaging actively in the governance of target companies. While other institutional investors at times play a similar monitoring role, the lack of explicit liabilities, the long-term investment horizon, the low need for short-term liquidity, and the capability of SWFs to acquire large stakes represent qualitative differences

[1] Mikkelson and Ruback (1985), Holthausen, Leftwich, and Mayers (1987, 1990), and Hertzel and Smith (1992) find positive stock price reactions to corporate purchases of another company's equity securities, and Hertzel et al. (2002) and Wruck and Wu (2009) similarly find that public firms that place equity privately experience positive announcement effects. Also, a large literature finds positive target stock price reactions to share acquisitions by hedge funds (Brav et al. 2008; Klein and Zur 2009) and other institutional investors, due either to anticipated monitoring or in anticipation of an acquisition (Greenwood and Schoar 2009).

with respect to private financial investors, which could be reflected in higher relative valuations of investment targets. However, there also may be a negative side to SWFs' investments, since sponsoring governments may impose noncommercial, political objectives, not fully consistent with the shareholder wealth maximization typically pursued by private firms. Alternatively, political concerns about state investor meddling may induce SWFs to refrain from taking an active corporate governance role in target companies, especially when investing abroad. SWFs might thus tend to be passive investors who, at best, do not contribute to the effective monitoring of target firm managers and, at worst, help to entrench underperforming management teams. As a consequence, investments by SWFs might create less value for target firms than do comparable investments by private-sector investors, who are not affected by political objectives and can exercise unconstrained ownership and control rights.

We test these contrasting predictions using a manually constructed dataset of 1,018 investments by SWFs (or by SWF-owned investment subsidiaries) in publicly traded firms, over the 1980–2012 period, and a "benchmark" control sample of 5,975 stock purchases by private financial investors. We document strong, robust evidence of a statistically and economically significant "SWF discount" wherein SWF stock purchases have a smaller valuation impact on target firms than do comparable stock purchases by private investors. Announcements of SWF investments are associated with a positive mean abnormal return of 0.84%, compared with the 4.82% mean abnormal return generated by the private benchmark investors. We restrict the benchmark sample to the same acquirer and target countries, as well as to the same time frame, yet SWF acquisitions differ significantly from those by private financial investors: SWFs tend to target larger (higher total assets) and more profitable (higher return on assets) firms, but tend to buy smaller stakes and acquire control less frequently. Accordingly, we decompose this total discount into three components, due to, respectively, target characteristics, deal characteristics, and, most importantly, the fact that the investor is a SWF. We find that differences in target characteristics account for a large portion (approximately four-fifths) of this discount. Yet, even after controlling for these target and deal differences, the estimated "SWF discount" is statistically and economically significant, with a mean of −1.31%. Conservative back-of-the-envelope estimation translates that into an average discount on firm market capitalization in excess of $60 million for each SWF (rather than for each private-sector) investment in a publicly traded firm, or an aggregate discount of $60 billion in the sample we study.

While this discount is not consistent with the prediction that SWFs are better corporate monitors than are private sector investors, a weaker market reaction is consistent with the hypotheses of political interference and of excessive passivity, both of which predict lower firm valuation, but by different channels. We thus examine the determinants of this discount using regression

analysis, with the aim of discriminating between these alternative hypotheses. To mitigate the influence of SWF investment policies on coefficient estimates, we first employ propensity-score weighting of coefficient estimates and second limit our analysis to a sample of matched transactions. The analysis indicates that the discount is greater when larger and controlling stakes are acquired by highly politicized SWFs and, conversely, is smaller in the case of funds enjoying a higher degree of independence from the sponsoring government, most notably the Norwegian government pension fund-global (GPFG). Finally, the acquisition by a SWF of a seat on a target firm's board has a negative value impact, especially when combined with larger stakes acquired.

The long-term operating performance of targets shows significant deterioration following SWF investments relative to private investments, consistent with the short-term relative value impact. Difference-in-differences analysis reveals a decline in return on assets, sales growth, and market-to-book ratios over time horizons spanning up to three years after the SWF investment. Finally, regression analysis of operating performance confirms that larger stakes acquired by funds subject to political interference are associated with lower future profitability and growth.

We directly contribute to the literature studying SWFs. First, we assemble a unique dataset of SWF investments that is larger in size and scope—and more recently updated—than those used in extant studies, shedding light on a notoriously opaque market. Second, we are the first to systematically compare the value impact of SWF investments on targets to a suitable control sample of investments by private financial acquirers, while accounting for the nonrandom nature of the SWF target selection process.[2] Importantly, our methodological improvements lead to findings that are in sharp contrast with conclusions by Kotter and Lel (2011) that the "the magnitude of the market reaction is similar to the announcement effects of investments by institutional investors on stock returns for a comparable event window," as we provide robust evidence that the cumulative abnormal returns of SWF investments are instead significantly lower than those of comparable private-sector investors. In a similar fashion, our results cast doubts on the conclusion by Dewenter, Han, and Malatesta (2010) and Fernandes (2014) that SWFs behave, on average, as active investors. While our analytical framework is very different, our results support the findings by Knill, Lee, and Mauck (2012), who find that, over the five years following SWF investments, target firms experience both lower stock price returns and lower stock price volatility but that the decline in risk is not sufficient to

[2] Extant studies (Kotter and Lel 2011 in the second part of their analysis; Knill, Lee, and Mauck 2012; Fernandes 2014) compare the long-term performance of SWF investment targets with that of matched firms. These studies each identify a benchmark set of firms, while we focus on a benchmark set of transactions and on the subsequent performance of targeted firms. This is a meaningful distinction. First, having a benchmark set of investments allows for the comparison of announcement-period returns. Second, we maintain that the appropriate comparison group for firms subject to SWF investments is a set of firms with similar characteristics subject to similar private-sector investments, rather than a set of firms with similar characteristics not targeted in any discernable investment.

compensate for the lower returns; they conclude by noting that their results are inconsistent with SWFs providing the same monitoring benefits as other institutional investors. We further add to the literature on the impact of SWFs by showing that the market reaction to SWF investments is not uniform. The discount we observe is largely due to SWFs whose governance structures do not provide an effective shield against political interference, which has important implications both for the governments hosting SWFs and for the intense regulatory debate surrounding SWF investments.

Our research also adds to the literature on institutional ownership, by offering compelling evidence that the identity of an institutional investor has an impact on firm valuation. In this sense, we add to the research by Chen, Harford, and Li (2007), Brav et al. (2008), Klein and Zur (2009), and Ferreira and Matos (2008), by providing additional evidence of the fact that not all institutional ownership is value increasing and that not all institutional investors are good monitors. Finally, in a broader sense, our analysis makes a methodological contribution as well, as this study is the first, to our knowledge, to decompose the valuation effect of a corporate event, as proxied by the short-term stock price reaction.

1. Hypotheses and Testable Predictions

The hypotheses discussed below relate to the differential impact of SWF investments on firm governance and, ultimately, on firm behavior, relative to private-sector investments. In our empirical analysis, we do not directly observe firm governance; rather, we note that the extant literature finds firm governance to be related to firm value (proxied by abnormal returns at the time of SWF investment), profitability (return on assets), growth (sales growth), and valuation ratios (market-to-book ratio). Accordingly, we formulate our hypotheses and testable implications as they relate to firm value and operating performance (profitability, growth, and valuation multiples). Table 1 summarizes these hypotheses and predictions.

Because of their long investment horizon, large assets under management, and lack of explicit liabilities, SWFs may typify the patient, long-term shareholders with the power and incentives to monitor portfolio-firm managers, discipline underperformers, and sustain firm value creation in the long run idealized in the corporate governance literature (Shleifer and Vishny 1986; Edmans 2009; Cai, Garner, and Walking 2009; Chen, Harford, and Li 2007; Klein and Zur 2009). Their investments should therefore create more value in target firms than in those by comparable private-sector investors who typically have short-run liquidity needs and explicit (often quite large) liabilities to service. This hypothesis is consistent with the interpretation by Dewenter, Han, and Malatesta (2010) and Fernandes (2014) of the impact of SWFs' activism on firm value. The testable predictions of the "superior monitor hypothesis" (SMH) are (1) SWF investments in a target firm's stock should increase firm value and improve operating performance more than private-sector investments, (2) this

Table 1
Summary of hypotheses and testable propositions

Hypothesis	Predicted impact of SWF investments on firm value (as measured by the announcement-period abnormal stock return) and on the long-term operating performance (*ROA*, *Sales growth*, *Market to book*), relative to private sector investments	The predicted impact of SWF investment on firm value and performance, relative to private sector investments, conditional on				
		Active investment: stake acquired in target firm, controlling stake (>51%), appointing directors	Foreign SWF: binary variable (foreign = 1, domestic = 0)	Existing block holders: closely held shares in target firm	Political interference in the SWF: binary variable (political = 1; nonpolitical = 0), political index	SWF's country political regime: democracy score
Superior monitor hypothesis (SMH): SWFs as long-term shareholders have the power and incentives to monitor portfolio firm managers, discipline underperformers, and sustain firm value creation better than comparable private-sector investors.	higher	higher	lower	lower	not related	not related
Political agenda hypothesis (PAH): SWFs, unlike private-sector investors, pursue home-country governments' noncommercial objectives that conflict with shareholder wealth maximization.	lower	lower	higher	higher	lower	not related
Passive investor hypothesis (PIH): SWFs refrain from taking an active corporate governance role in target companies in order to not generate political opposition and create less value than unconstrained comparable private sector investors.	lower	higher	lower	higher	not related	higher

This table summarizes three hypotheses regarding the impact that investments by sovereign wealth funds (SWFs) have on target firm valuation and operating performance, relative to the impact of similar investments by comparable but privately owned financial investors. The first column lists and summarizes the three hypotheses. The second column describes the predicted impact SWF investments will have on announcement-period target stock return and on the target's long-term operating performance, relative to private-sector investments. Columns 3 to 7 outline how each hypothesis predicts how this valuation impact would differ depending on, respectively, the degree of activism of the investing SWF, for foreign (rather than domestic) SWF investments, for target firms with other large blockholders, and for investments by political (rather than nonpolitical) SWFs, as well as the level of democracy associated with the SWF sponsoring government.

relative impact of SWFs on firm value and performance should be related to the extent of SWF involvement, as measured by the size of the stake acquired, acquisition of majority control, and appointment of directors on target firm boards, (3) SWFs should be able to influence domestic firms more effectively that foreign firms, so this relative impact should be greater for domestic firms, and (4) as the marginal benefit of additional monitoring is likely lower for firms with other significant blockholders, the relative impact of SWF investments should be smaller in such target firms.

On the other hand, existing theory and empirical evidence suggests that politicians are "bad owners" of corporations as they typically impose political objectives that negatively affect shareholders' value (Shleifer and Vishny 1994; Megginson and Netter 2001; Estrin et al. 2009). Being ultimately owned and controlled by governments, the same logic applies when SWFs become shareholders in target firms. More specifically, SWFs may not be seeking only the highest possible financial returns, but may be used instead by home-country governments to exert political influence in target firms. Accordingly, a negative impact of SWF investments on target firm performance could result from the imposition of a political agenda by SWFs diverting portfolio firm resources to the benefit of SWF-sponsor countries or their rent-seeking politicians. The relationship between Abu Dhabi's Mubadala and General Electric (GE) exemplifies the potential for distortions in firm behavior. In 2009, Mubadala announced ownership of stake in GE equivalent to about 0.6% of shares outstanding and the intention to acquire a larger stake and to become one of the ten largest shareholders. In 2010, a venture (Mubadala GE Capital) was established, with partnership and equal capital commitments by Mubadala and GE. The partnership was described at the time as "a cornerstone of Abu Dhabi's drive to develop its local financial sector and give training to citizens looking at careers in the field. It is also a crucial part of a broader effort to wean the emirate's economy off oil."[3] While the actual performance of the partnership was never fully transparent, a recent analysis by the ratings agency Moody's states that the joint venture is a "weak intrinsic franchise with limited origination capabilities" and has "modest profitability, which limits internal capital generation."[4] More than a commercial venture for GE, this joint venture appears to have been quid pro quo for capital injection, prioritizing the development goals of the Abu Dhabi government over the interests of the GE shareholders. But political actions can be, at times, less subtle. After the collapse of its majority-owned Spanish conglomerate, Grupo Torras, the Kuwait Investment Office was accused of syphoning $300 million from the group's reserves to make political payments in support of the war effort during the first

[3] "Mubadala GE Capital eyes bond sales, expansion," *Gulf News*, October 28, 2013.

[4] For Moody's full report, see www.moodys.com/research/Moodys-assigns-Baa2-issuer-ratings-to-Mubadala-GECapital- Ltd–PR_310677?WT.mc_id=AM~WWFob29fRmluYW5jZTQyX1NCX1JhdGluZyBOZXdzX0FsbF9Fbmc%3D~20141 023_PR_310677.

Gulf War, mainly in the form of public relations expenses aimed at shifting public opinion.[5] As no such political interference is associated with private-sector investments, this could lead to a weaker market reaction and lower long-term operating performance for targets of SWF investments. Hence, the "political agenda hypothesis" (PAH) predicts that (1) SWF investments should lead to lower firm value and performance relative to private-sector investments, (2) as the ability to impose political goals is related to the degree of influence the SWF has on the investment target, larger stakes acquired, the acquisition of majority control, and the appointment of directors on target firm boards should lead to relatively lower firm value and performance, (3) companies operating beyond the sovereign authority or government regulatory power should be less exposed to political interference, and thus foreign SWF investments should be associated with relatively higher firm value and performance, (4) the presence of blockholders in a target should mitigate the influence of politically motivated SWFs in target firms and lead to relatively higher firm value and performance, and (5) political interference should have a stronger impact on investments by "political" funds than for independent, professionally managed funds and hence political funds should be associated with relatively lower firm value and performance.

As noted above, the sovereign nature of SWFs leads to suspicion by market participants, especially if the SWF is owned by a foreign government. SWFs might thus refrain from taking an active corporate governance role in target companies in order to not generate political opposition or regulatory backlash. Extant evidence indicates that SWFs play only a small visible role in target firm corporate governance and rarely take seats on target firm boards (Mehropouya, Huang, and Barnett 2009; Rose 2008).[6] In addition, the monitoring role of SWFs might be further reduced by their reluctance to divest, as selling large blocks of shares could also trigger political reactions and resentment amongst local management, regulators, and market participants. Accordingly, SWFs' investments might be expected to become captive capital, making SWFs unlikely even to exercise this type of governance upon threat of exit discussed by Parrino, Sias, and Starks (2003) and Admati and Pfleiderer (2009) or to withhold their votes as a sign of displeasure with current managers (Del Guercio, Seery, and Woitdke 2008; Edmans 2009). According to this hypothesis, SWFs will tend to be very passive investors who, at best, do not contribute to effectively monitoring target firm managers and, at worst, can help entrench underperforming managers. As a consequence, investments by SWFs will create less value for target firms than will comparable investments by private-sector investors who will instead exercise unconstrained ownership

[5] "Missing Millions – Kuwait's Bad Bet – A Special Report.; Big Wallets and Little Supervision," *New York Times*, September 28, 1993.

[6] We should note that not all commentators agree. For example, Dewenter, Han, and Malatesta (2010) interpret their results as indicating an active governance role for SWFs.

and control rights. The testable predictions of the "passive investor hypothesis" (PIH) are (1) SWF investments should lead to lower firm value and performance relative to private-sector investments, (2) a tendency toward a passive stance would be reinforced by a lack of influence on target firms and hence lower stakes acquired, the lack of control, and the absence of directors on the corporate board should lead to relatively lower firm value,[7] (3) given the higher risk of hostile reactions, SWFs are more likely to assume a passive stance when investing in foreign firms, so foreign SWF investments should be associated with relatively lower firm value and performance, (4) since other blockholders could provide monitoring benefits even when SWFs are not doing so, the presence of other significant blockholders in target firms should lead to relatively higher firm value and performance, and (5) due to enhanced political risk and hostile reactions by other investors, SWFs from undemocratic or authoritarian regimes should be more likely to assume a passive stance, leading to relatively lower firm value and performance.

Given this set of conflicting predictions, the net impact of SWF investments on firm value and operating performance can be only determined through empirical examination. We emphasize that our main objective is to not document the raw valuation impact of SWF investments per se but to compare and contrast them to those resulting from similar, but private-sector, investments. We employ standard event-study techniques, supplemented by regression analysis, to achieve this and focus on measuring target firms' abnormal stock-price reaction at the announcement of SWF investments and on their long-term operating performance, suitably benchmarked against private shareholders' investments.

2. Data and Descriptive Analysis

2.1 Sovereign wealth fund definition and list

There is no consensus on exactly what constitutes a "sovereign wealth fund." This study employs the Sovereign Investment Lab's (SIL) selection criteria, presented in Miracky and Bortolotti (2009), which defines a SWF as (1) an investment fund rather than an operating company, (2) being wholly owned by a sovereign government, but organized separately from the central bank or finance ministry to protect it from excessive political influence, (3) making international and domestic investments in a variety of risky assets, (4) being charged with seeking a commercial return, and (5) a wealth fund rather than a pension fund, meaning that the fund is not financed with contributions from pensioners and does not have a stream of liabilities committed to individual

[7] Another proxy of passivity is large stakeholdings by shareholders without board seats, as a sign of willingness to avoid control despite significant ownership rights. This variable will be used in the regression analysis.

citizens.[8] These criteria yield a sample of thirty-three sovereign wealth funds from twenty-one countries. We find public equity investments with sufficient data for nineteen of those funds, originating from fifteen countries, and the resulting sample we employ is described in Table 2.[9] Total assets for the funds in our list are worth of $2.97 trillion, representing 71% of total asset under management by SWFs documented by Megginson and Fotak (2014).

2.2 SWF deals and activism

The sample of SWF investments analyzed here originates from the SIL SWF Database. The database covers domestic and international investments made by SWFs, by SWF-majority-owned subsidiaries (including fully owned SWF investment vehicles) between January 1980 and November 2012.[10] The data include investments in listed equity, unlisted equity, commercial real estate, private equity funds, and joint ventures in which a SWF (or one of its majority-owned subsidiaries) is an investor. The data are assembled using multiple public sources. Information from five financial databases (Thomson One Banker, Bloomberg, the Thomson Reuters SDC Mergers and Acquisitions database, the Zephyr M&A database, and Zawya Limited) is integrated with data from fund Web sites and from various news sources.[11] From this dataset, we select

[8] While this sounds clear-cut, ambiguities remain. Several funds headquartered in the United Arab Emirates are defined as SWFs, even though these are organized at the emirati, rather than at the federal, level, because the emirates are the true decision-making administrative units. The subnational UAE funds included are Abu Dhabi Investment Authority, Investment Corporation of Dubai (and its subsidiary Istithmar World), Mubadala Development Company, Dubai International Financial Center, International Petroleum Investment Corporation (IPIC), and Ras Al Khaimah Investment Authority. We also include Norway's GPFG since, despite its name, it is financed through oil revenues rather than through contributions by pensioners and does not have any explicit pension liabilities.

[9] This table is based on a more comprehensive description of individual SWFs presented in Megginson and Fotak (2014). For the complete list of SWFs meeting the SIL definition, see Bortolotti (2014). Many smaller SWFs are both notoriously opaque in their investments and, at least partly due to their small size, less active. Our dataset includes investments by 15 of the largest 17 SWFs (as ranked by assets under management).

[10] We identify over 150 majority-owned (including fully owned) subsidiaries. In the remainder of the paper, any reference to "SWF investments" includes investments by majority-owned subsidiaries, and any transactions by "SWF acquirers" include transactions in which the acquirer is either a SWF or a SWF-majority-owned subsidiary. As the main purpose of this study is to determine the impact of SWFs on investment targets, we include, in our sample, all investments executed under the control of SWFs. In identifying such investments, we use a controlling stake (equity ownership exceeding 50%) in the acquiror as a proxy for SWF control and decision making. Yet, we note that investment vehicles that are majority, but not fully, SWF owned are rare in our sample, and the overwhelming majority of subsidiary investments in the sample originate from fully owned subsidiaries. In unreported analysis, we include only investments by fully owned subsidiaries and note that results are largely unaffected.

[11] The sources include the Lexis-Nexis database and the archives of *Financial Times*, *New York Times*, *Wall Street Journal*, *GulfNews*, the Associated Press, Reuters, and others. We employ an additional methodology to collect investments made by Norway's GPFG. Since this fund almost exclusively accumulates small stakes through open market purchases, its investments are rarely documented in the press and are almost never recorded by commercially-available databases. GPFG does, however, post annual listing of all its equity holdings, and investments in U.S.-listed stocks made by Norges Bank Investment Management (NBIM), the asset management arm of the GPFG, are publicly disclosed on a quarterly basis beginning in the fourth quarter of 2006. Using this, we generate a list of new NBIM investments in U.S.-listed companies by tracking the annual investment lists and determining when NBIM makes an initial investment, which we define as an investment that did not appear in the previous year's listing. We then follow NBIM's holdings after the initial investment and record increases

Table 2
List of sovereign wealth funds

Country	Fund name	Assets under under management U.S. billion	SIL database						
			Obs	Total deal value U.S. Mn	Average deal value U.S. Mn	Average deal stake	Fraction of investments with directors	Political fund (y/n)	Political index
Norway	Government Pension Fund – Global	$746.3	402	$6,649.84	$16.79	0.34%	0.00%	n	0
China	China Investment Corporation	$482.2	46	$98,478.90	$2,525.10	12.00%	10.64%	y	1
UAE - Abu Dhabi	Abu Dhabi Investment Authority	$450.0	26	$11,523.48	$606.50	8.89%	3.85%	y	3
Kuwait	Kuwait Investment Authority	$296.0	27	$15,207.92	$800.42	6.25%	0.00%	n	0
Singapore	Government of Singapore Investment Corporation	$220.0	102	$30,717.39	$388.83	7.01%	3.74%	n	1
Singapore	Temasek Holdings	$157.9	196	$59,030.75	$385.82	19.06%	5.91%	n	1
Qatar	Qatar Investment Authority	$135.0	66	$63,724.28	$1,481.96	10.96%	9.86%	y	3
Australia	Australian Future Fund	$83.1	4	$628.90	$157.22	1.13%	0.00%	n	0
UAE - Dubai	Investment Corporation of Dubai	$70.0	1	$1,245.90	$1,245.90	0.03%	0.00%	y	3
UAE - Abu Dhabi	International Petroleum Investment Company	$60.0	28	$29,556.56	$1,343.48	24.09%	18.18%	y	3
Libya	Libyan Investment Authority	$64.2	20	$1,368.55	$124.41	14.96%	13.64%	y	3
UAE-Abu Dhabi	Mubadala Development Company PJSC	$53.1	16	$5,658.77	$565.88	33.84%	0.00%	y	2.5
Republic of Korea	Korea Investment Corporation	$43.0	4	$2,889.72	$963.24	8.47%	0.00%	n	0
Brunei	Brunei Investment Agency	$39.0	3	$234.77	$117.38	25.20%	0.00%	y	3
Malaysia	Khazanah Nasional Berhard	$40.2	37	$8,594.41	$286.48	21.94%	15.69%	n	1
UAE - Dubai	Istithmar World	$11.5	21	$4,464.16	$297.61	25.60%	4.55%	y	2.5
Bahrain	Mumtalakat Holding Company	$11.2	1	$199.23	$199.23	6.67%	0.00%	y	3
Oman	State General Reserve Fund	$8.2	8	$1,158.85	$193.14	12.80%	18.18%	y	3
UAE - Dubai	Dubai International Financial Center	na	10	$10,752.48	$1,194.72	19.43%	10.00%	y	3
Total, all funds (U.S. billion)		$2,970.90	1,018	$352,084.86					

This table lists the nineteen funds that meet the Sovereign Investment Laboratory (SIL) definition of a SWF and for which we have available transaction data. For each fund, the table includes the country of origin, the fund's name, the estimated fund size (assets under management in U.S.) as of March 17, 2014, the number of investments, the total value and average value of investments, the average target firm stake acquired, the proportion of that fund's deals for which the SWF obtains a board seat, whether the fund is "political" (managers are under direct political control, as described in Table A1 in the Appendix), and the fund's *Political Index* value, where higher values (maximum of 3.0) indicate greater political control (as described in Table A1 in the Appendix).

a subset of investments by SWFs (or their majority-owned subsidiaries) in publicly traded firms. We limit the analysis to publicly traded firms as we require firm-level data (both accounting and stock price information). Our final sample contains 1,018 investments by SWFs (or majority-owned subsidiaries) in publicly traded targets, for a total value of $352.1 billion. To our knowledge, our sample is not only the most recently updated one but is also the largest transaction-based sample employed in any study of the valuation impact of SWFs.[12] For comparison, Dewenter, Han, and Malatesta (2010) assemble a sample of 996 transactions spanning 1997 to 2008, but those include transactions not classified as investments (such as transfers between SWF subsidiaries and asset purchases) and some transactions that are disaggregated into multiple trades (for example, if a SWF acquires partial stakes in the same target through different subsidiaries, which we count as a single observation). The set of observations used in their empirical analysis is restricted to 227 investments and 45 divestments, in contrast with our largest event-study sample of 799 transactions. Kotter and Lel (2011) study 503 SWF investments over the period 1980 to 2009, of which 417 are employed in empirical analysis. Knill, Lee, and Mauck (2012) employ in their analysis a sample of 231 SWF investments.

Table 2 reports summary statistics about investments by individual SWFs. Investment activity varies greatly across funds; average deal size ranges from a tiny $16 million for Norway's GPFG to $2.5 billion for China Investment Corporation (CIC). Gulf state SWFs, such as Qatar Investment Authority and International Petroleum Investment Corporation (IPIC), also display a preference for very large investments, surpassing on average the $1 billion mark. Not surprisingly, SWFs vary in average size of stakes acquired. The strong preference for broad portfolio diversification by Norway's GPFG is reflected in the small stakes acquired (0.34% on average). On the other hand, Abu Dhabi's funds, such as Mubadala and IPIC, and Singapore's Temasek tend to buy the largest stakes, with averages ranging from 18% to 33%.

We further collect data on the total number of directors and individual board member affiliations from a target company's first annual report subsequent to the SWF investment. Overall, SWFs seem quite reluctant to take board seats, as they appoint directors in only 9.05% of investments in our sample; this is significantly less frequent than director appointments observed for a

in their holdings as follow-on investments. We take the filing date—the day when NBIM files a Form 13F-HR detailing its shareholdings in a listed firm—as the announcement date for event studies, since this is the date that the stock ownership information is first disclosed. Given our reliance on Form 13F-HR as a data source, this data is specific to investments in U.S. listed firms.

[12] In contrast, a handful of studies employ larger datasets on SWF shareholdings at specific points in time, rather than transactions. Fernandes (2014), Avendaño (2012), Avendaño and Santiso (2011), and Dyck and Morse (2011) examine samples of SWF shareholdings in as many as 26,000 companies, all for holdings as of year-end 2008 or earlier. Lacking information on the investment transaction (including the announcement and completion dates), these studies are unable to gauge the valuation impact of SWF investments in an event-study framework.

comparable sample of private-sector investments (24.69%).[13] Yet, we find great variation in domestic versus foreign deals. While SWFs take seats in only 6.74% of foreign investments (compared to 29.46% for benchmark private deals), they do so in 30.30% of domestic investments (which is higher than the estimated 22.99% for benchmark domestic deals). Our estimates are significantly lower than those by Dewenter, Han, and Malatesta (2010) for the overall sample (6.74% versus their 15%) but our remarkably similar for domestic investments (30.30% versus 28.2%).[14] Interestingly, we do not find any directors appointed by the Kuwait Investment Authority, Korea Investment Corporation, or Abu Dhabi's Mubadala (or their subsidiaries) to the boards of any target companies, in spite of the large stakes often being acquired. The SWFs with the highest propensity to acquire seats are IPIC and Oman's State General Reserve Fund.

2.3 Classifying funds according to the degree of political independence

A defining characteristic of SWFs is their political nature, due to interference by the sponsoring government, so we classify funds according to the degree of political independence enjoyed by their managerial teams. Truman (2008) offers, for each fund, a score (question eleven in Truman (2008): "Are decisions on specific investments made by the managers?") on a scale of zero to one, in quarter-point increments, reflecting the level of independence of management from governmental interference, with one indicating full independence. Accordingly, we classify all funds with a managerial independence score of less than one as "political funds" and all others as "nonpolitical funds," and we create a related binary variable (*SWF political dummy*) set equal to one for "political funds" and zero otherwise. Truman's classification excludes four funds covered by our sample (Investment Corporation of Dubai, Dubai International Financial Center, IPIC from Abu Dhabi, and Mumtalakat from Bahrain). We classify those funds as "political funds," on the basis of their own disclosures and analysis by the Sovereign Wealth Fund Institute. Our core results are robust to reclassifying these funds and to excluding these funds from our sample (cumulatively, these funds account for 40 of the 1,018 transactions in our sample).

As an alternative measure of political interference, we create a "political index" (*SWF political index*). We construct this index by first adding the scores to Truman (2008) question nine ("Is the role of the government in setting the investment strategy of the SWF clearly established"), question ten ("Is the role of the managers in executing the investment strategy clearly established?"), and question eleven ("Are decisions on specific investments made by the managers?"). We compute the final index as three minus the sum of the scores

[13] Because of the amount of effort involved in collecting reliable data on director appointments, we collect these data only for a matched sample of private sector investments (not for the entire set of benchmark transactions), resembling SWF investments in terms of both target and deal characteristics, as described in Section 3.

[14] The difference in the overall sample is likely driven partly by our inclusion of Norway's investments in the sample, as the fund never assumes seats (if we exclude Norway, our proportion estimates approaches 13%).

assigned by Truman (2008) for questions nine, ten, and eleven, so our political index ranges from zero to three, in quarter point increments, with higher values indicating more political interference. As above, we classify the four funds not included in Truman (2008) as having the highest value on the political index.

Table 2 shows that SWFs are quite evenly split in terms of managerial independence, with 11 out of 19 classified as "political." Not surprisingly, we find lower scores for political interference in SWFs originating from advanced OECD countries, such as Norway, Australia, and Korea. An effective shield against political interference is also in place at the Kuwait Investment Authority and the Singaporean funds Temasek and GIC. However, nine funds from different regions operate under strict government control.

One limitation of our classification scheme is that the scores are recorded at a single point in time, the year 2008. Accordingly, our investigation allows for cross-sectional comparison, but no time-series variation within each SWF's investment portfolio. We are somewhat reassured, on the other hand, by the fact that subsequent studies (Truman 2011; Bagnall and Truman 2011) find little variation across time. Bagnall and Truman (2011) document a slight improvement in question nine, but they warn of the improvement being possibly due to self-reporting bias.

2.4 The benchmark sample

We construct a "benchmark sample" to draw a comparison between SWF investments and similar investments by other, non-government-owned financial firms. We obtain this sample by downloading, from the Thomson Reuters SDC Platinum Mergers & Acquisitions Database (SDC), a dataset including all investments with announcement dates between December 1, 1980 and November 1, 2012, with a publicly traded target and with the acquirer having a Standard Industry Classification (SIC) code between 6000 and 6999, as an identifier for financial firms. As a first filter, we only keep transactions in which the acquirer originates from one of the fifteen countries in which SWF acquirers in our sample are based and for which the target firm is headquartered in one of the 54 countries in which SWF investment targets are headquartered. We further exclude transactions classified as leveraged buyouts, recapitalizations, self-tender offers, exchange offers, repurchases, and privatizations; we also exclude all instances of debt restructurings (transactions with an acquisition technique labeled as "debt restructuring" or with an acquirer labeled as "creditor").[15] Transactions with the status listed as "rumor," "discontinued rumor," "status unknown," "seeking buyer," or "seeking buyer withdrawn" are also excluded, as are all deals with SWF involvement, either marked as "SWF Involvement Buyside" or "SWF Involvement Sellside" or manually identified as having as

[15] These filters are standard in empirical studies using the SDC database. For example, the same filters are used in Ferreira, Massa, and Matos (2010), but there the authors further exclude all minority acquisitions. Similarly, the same filters are applied by Karolyi and Liao (2014), but there the authors further exclude all domestic deals.

a buyer or seller a SWF, a SWF subsidiary, or a SWF investment vehicles. We further exclude all deals in which the immediate or ultimate parent of either the target or the buyer is identified as "government." Finally, we exclude all transactions for which the target does not have a Datastream code and all transactions with individuals as acquirers. The resulting sample contains 5,975 observations with a total deal value of $224 billion.

2.5 Variable definitions and data sources

A table listing all variables, variable definitions, and data sources can be found as Table A1 in the Appendix. Deal-based variables (such as *Deal value* and *Deal stake*) originate from the SIL SWF Database, the construction of which is described in Section 2.1. Target-specific variables (*Total assets*, *Return on assets*, *Quick ratio*, *Closely held shares*, *Sales growth*, *Debt to assets*, and *Market to book*) are obtained from the Thomson Reuters Worldscope (Worldscope) database, in U.S. dollars; data on directors are collected as described in Section 2.2. In the descriptive statistics and matching procedures, we present and employ target metrics as of December 31 of the year prior to the investment. Dollar-denominated metrics (as opposed to ratios) are scaled to 2000 U.S. dollars using the Consumer Price Index (All Urban Consumers) from the U.S. Bureau of Labor Statistics.

Daily stock price performance data and daily local equity index values are obtained from the Thomson Reuters Datastream (Datastream) database; in particular, we employ the *Total return index*, in U.S. dollars, to compute daily returns for both individual equities and associated market indices. Finally, we collect country-specific data for both acquirer and target nations from a plurality of sources: *GDP per capita* (defined as the target-country GDP in 2000 USD divided by national population), *GDP growth*, and *Market capitalization to GDP* (defined as the total market capitalization of all publicly listed domestic firms divided by GDP) are from the World Bank.

We further use a variable measuring legal origin (*Target country common law*), identifying "common law" legal origin from La Porta et al. (1998) and variables measuring the level of democracy from the Polity IV Project (*Acquirer country democracy* and *Target country democracy*, defined as the difference between the "Democracy" and "Autarchy" scores). The same metric of the level of democracy derived from the Polity IV dataset has been widely used in the "law and finance" literature, for example, Ayyagari, Demirgüç-Kunt, and Maksimovic (2006) and Rodrik and Wacziarg (2005).

Anecdotal evidence suggests that SWFs were very active in Western markets during the recent financial crisis. To explore whether there is a systematic tendency for SWFs to play a more active role as investors during crises, and to prevent such tendency from affecting our estimate of the impact of SWFs on firm value, we control for the impact of banking crises both on the SWF investment process and on firm value and performance. Banking

crises are identified using the methodology described by Laeven and Valencia (2010, 2012). The related dataset lists banking crises across the world from 1970 to 2012, and identifies the countries and years during which banking crises took place, based on two conditions: (1) significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and bank liquidations) and (2) significant banking policy intervention measures in response to significant losses in the banking system.

2.6 Univariate comparisons between SWF and benchmark samples

Since we focus on comparing the impact of SWF investments on firm value to the impact of private-sector financial investors, it is important to first understand if and how SWF investments differ from private-sector investments. Simple descriptive statistics, although not conclusive, help to identify possible systematic preferences in SWF target selection.

Table 3, panel A, reports mean, median, and number of observations for all continuous variables for both the SWF and benchmark samples. This panel also presents $t-$statistics for a test of differences between SWF and benchmark sample means, computed with standard errors clustered at the investment target level. The mean (median) value of SWF investments, $408.45 million ($18.65 million), is significantly greater than the $49.56 million ($8.19 million) value for benchmark investments, but the 8.45% mean (1.23% median) stake acquired by SWFs is significantly smaller than the 22.60% mean (12.09% median) stake acquired by benchmark investors.[16] Consistently, SWFs tend to invest in larger firms: the mean (median) total value of assets of SWF investment targets is $82.83 billion ($3.46 billion), compared with $1.77 billion ($96.68 million) for the benchmark sample. SWF investment targets also tend to have higher return on assets but lower liquidity and sales growth, and SWFs tend to invest in countries that are more developed (higher democracy score and GDP per capita) but have lower GDP growth.

Panel B of Table 3 reports descriptive statistics for binary variables in both the SWF and benchmark samples, with the related z-statistic from a binomial test of differences in proportions between the two samples. Out of the 1,018 (5,975) investments in the SWF (benchmark) sample, 87.76% (16.64%) are foreign, 4.4% (12.71%) involve acquisition of a controlling stake exceeding 50% of shares outstanding, 62.57% (59.55%) are initial investments in a specific target, 75.34% (62.41%) involve an acquirer from a common-law country, 13.27% (13.46%) are capital injections, and 49.36% (3.87%) are initiated during a banking or financial crisis.

[16] Investments by Norway's GPFG are generally smaller than those of other SWFs, both in terms of size of the stake acquired and deal value. Excluding Norway from the SWF sample increases mean (median) stake acquired to 15.33% (7.8%) and the mean (median) deal value to $741.23 million ($116.41 million), though both the mean and median still remain significantly smaller than those of private investments.

Table 3
Characteristics of the sample of SWF investments and the benchmark sample of investments in publicly traded firms

Panel A: Continuous variables

	SWF sample			Benchmark sample			Difference in means	
Variable	Mean	Median	N	Mean	Median	N		*t*
Deal value (U.S. Mn)	$408.45	$18.65	862	$49.56	$8.19	4,528	$358.89	5.84***
Stake	8.45%	1.23%	863	22.60%	12.09%	4,310	−14.15%	−16.84***
Stake owned	12.95%	0.77%	686	29.94%	16.40%	4,416	−16.99%	−9.88***
Acquirer country democracy	1.56	−2.00	988	3.36	6.00	4,923	−1.80	−3.48***
Target country democracy	6.18	10.00	980	4.77	8.00	5,577	1.41	2.77***
Target country GDP per capita (U.S.)	$25,992.60	$31,247.00	1,001	$17,871.06	$20,387.77	5,975	$8,121.54	7.88***
Target country GDP growth	1.19%	0.88%	989	3.43%	2.87%	5,576	−2.24%	−8.06***
Target country market cap to GDP	106.05%	82.55%	998	110.14%	96.23%	5,975	−4.09%	−1.02
Total assets (U.S. Mn)	$82,826.71	$3,464.68	912	$1,773.87	$96.68	5,024	$81,052.84	3.63***
Return on assets	4.48%	5.70%	876	−15.33%	1.86%	4,732	19.81%	3.10***
Quick ratio	170.00%	101.00%	686	328.00%	90.00%	4,084	−158.00%	−4.10***
Closely held shares	32.92%	25.80%	736	36.49%	5.80%	4,704	−3.57%	−0.92
Sales growth	20.86%	13.54%	884	44.54%	45.26%	3,144	−23.68%	−14.88***
Debt to assets	26.26%	23.19%	903	28.65%	19.79%	4,815	−2.39%	−1.15
Market to book	1.19	1.92	835	3.15	1.35	4,807	−1.96	−1.00

(*continued*)

Table 3
Continued

Panel B: Binary variables

Variable	SWF sample		Benchmark sample		Difference	
	Proportion	N	Proportion	N	Proportion	z
Foreign	87.76%	894	16.64%	4,981	71.12%	39.14***
Control	4.40%	38	12.71%	548	−8.31%	−8.57***
First investment	62.57%	637	59.55%	3,558	3.02%	1.30
Target country common	75.34%	767	62.41%	3,729	12.93%	4.46***
Capital injection	13.27%	135	13.46%	804	−0.19%	−0.13
Crisis	49.36%	502	3.87%	231	45.49%	14.31***

Panel C: Industrial distribution of investments

Industry	SWF sample		Benchmark sample	
	Proportion	N	Proportion	N
Oil and gas	7.11%	72	3.51%	210
Basic materials	6.80%	69	13.88%	829
Industrials	18.17%	185	19.02%	1,136
Consumer goods	8.32%	85	12.01%	718
Health care	5.28%	54	4.10%	245
Consumer services	11.17%	114	11.51%	688
Telecommunications	3.65%	37	1.11%	66
Utilities	3.65%	37	1.58%	94
Financials	29.54%	301	25.52%	1,525
Technology	6.29%	64	7.78%	465
Missing	3.24%	33	0.37%	22

This table includes descriptive statistics for the sample of SWF investments and the related benchmark sample of investments by private-sector financial institutions from the same countries. Panel A contains mean, median, and number of observations for each of the continuous variables for both samples, and results from a t-test for differences in means, with standard errors clustered at the target-firm level. Panel B contains the proportion (out of the total number of nonmissing observations) and count of the instances in which a binary variable assumes the value of one and the results from a binomial test for differences in proportions. Panel C details the proportion (out of the total number of nonmissing observations) and count of investments by target industry (based on the Industry Classification Benchmark by FTSE International). Variables are as defined in Table A1 in the Appendix. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level.

The industrial distribution of investments is described in Table 3, panel C. SWF investments are heavily focused on the financial industry (29.54% of all investments) and on industrials (18.17%). The benchmark sample reveals similar patterns, with 25.52% of all investments in financials and 19.02% industrials. We also examine, but do not report, the temporal and geographic distributions of investments. Investments in our sample span 1983 to 2012. While both SWF and benchmark samples are biased toward more recent years, this bias is more pronounced in the SWF sample, with approximately half of these observations being initiated after January 2008. Finally, SWF investments are concentrated in the United States (44.32% of the total), though this largely reflects the impact of investments by Norway's GFPG; excluding these, U.S.-headquartered target firms account for 11.88% of the number of SWF investments. China, Singapore, India, and the United Kingdom are the next most common targets of SWF investments, with the first two of these involving mostly domestic deals.

3. The Short-Term Market Impact of SWF Investments

We examine the valuation impact of SWF investments on target firms, both absolute and relative to comparable private-sector investments, in two ways. First, we measure the impact of investment announcements using event-study methods. Second, we measure the long-term impact of investments on long-term operating performance. We present event-study results in this section.

Our main proxy for the impact of SWF investments on firm value is the abnormal return at the time of the investment announcement. Cumulative abnormal returns (CARs) are computed by subtracting the market-model expected return from the target firm's stock total return over various intervals on and around the day on which the announcement of the investment occurs (day 0).[17] We compute market-model expected returns by first estimating model parameters using daily returns over the year (250 trading days) ending 20 trading days prior to the announcement date. We present results for the event day (day 0) but also for the three- (−1,+1) and eleven-day (−5,+5) event windows; in our discussion, we emphasize the three-day window (−1,+1) to capture the effect of possible previous-day leakage of information or next-day reaction (common when announcements occur "after hours" or in distant time zones), while avoiding the increased noise of the longer event window.

Results for the full sample of SWF investments are presented in Table 4, panel A. We are able to compute three-day abnormal returns for 796 observations out of the total sample (1,018 observations); observations are excluded from the analysis if return data are missing during the event window or if there are fewer than twenty nonmissing daily data points during the estimation period. The mean (median) three-day CAR is 0.84% (0.07%). We test the statistical significance of mean abnormal returns using the bootstrapped, skewness-adjusted $t-$test described by Hall (1992) and Lyon, Barber, and Tsai (1999) to correct for the skewness of abnormal returns, and we employ a generalized sign test for medians.[18] All results are statistically significant at the 1% or 5% level over the one- and three-day event windows based on both tests; over the eleven-day event window, the mean abnormal returns are insignificant at conventional levels, whereas the median is significant at the 5% level.

Norway's GPFG is often cited as being different from other SWFs, both in terms of internal organization and investment style.[19] Accordingly, Dewenter, Han, and Malatesta (2010) check whether their results are driven by GPFG

[17] Total returns for securities and local market indices are obtained from Datastream and are adjusted for dividends and splits. While returns are computed in U.S. dollars, for both individual securities and local-market indices, unreported robustness tests verify that results are unaffected by this conversion.

[18] For robustness, we also employ the standard Patell's z test for significance of mean CARs, the crude-dependence adjusted (CDA) t-statistic proposed by Brown and Warner (1985) for means, and a nonparametric Wilcoxon sign-rank test for the significance of medians. All tests indicate high levels of statistical significance for the one- and three-day event windows, but they offer mixed evidence over the longer window.

[19] Norway's GPFG is often hailed as being the most professionally managed and most transparent SWF. Various studies have focused on its structure and behavior (Caner and Grennes 2009; Ang, Goetzmann, and Schaefer

Table 4
Short-term market reaction to announcements of SWF and benchmark investments

Panel A. All sovereign wealth fund investments

Interval	Obs.	Mean cumulative abnormal return	Bootstrapped, skewness-adjusted t	Median cumulative abnormal return	Generalized sign z
(0,0)	795	0.95%	3.809***	0.04%	2.297**
(−1,+1)	796	0.84%	2.345***	0.07%	2.262**
(−5,+5)	799	0.55%	0.953	0.12%	2.513**
Panel B. Sovereign wealth fund investments, excluding Norway					
(0,0)	399	1.95%	4.160***	0.12%	2.638***
(−1,+1)	400	2.38%	4.154***	0.50%	4.195***
(−5,+5)	403	1.68%	1.751**	0.22%	2.643***
Panel C. Benchmark investments					
(0,0)	4,823	2.53%	17.475***	0.14%	13.165***
(−1,+1)	4,830	4.82%	22.104***	0.92%	19.202***
(−5,+5)	4,843	7.09%	9.776***	2.54%	21.408***

This table includes cumulative abnormal stock returns, computed in U.S. dollars, for target firms' common equity on the days surrounding the announcement of an investment. Daily abnormal returns are computed using a market model with parameters estimated over 250 trading days ending 20 trading days prior to the investment announcement. "Interval" indicates the time interval of interest relative to the date of the announcement of the investment (day 0). Observations (Obs.) reports the number of observations. "Mean cumulative abnormal return" and "Median cumulative abnormal return" report, respectively, average and median abnormal cumulative returns. "Bootstrapped, skewness-adjusted t" presents the skewness-adjusted$t$-statistic employed by Hall (1992) with p-values computed with nonparametric bootstraps. "Generalized sign z" reports the test statistic of a generalized nonparametric sign test for medians. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level. Panel A includes all announcements of SWF investments in publicly traded companies; panel B includes all announcements of SWF investments in publicly traded companies, excluding those made by Norway's SWF; and panel C includes all investment announcements for the benchmark sample of investments by private-sector financial firms.

investments by presenting core estimates from subsamples excluding GPFG. This is even more important here, as investments by GPFG account for almost half of the total number of investments in our sample. Accordingly, panel B replicates the event-study analysis, while excluding investments by Norway's GPFG. This increases estimated CARs substantially: over the three-day event window, the mean CAR for SWF investments is 2.38% and the median CAR is 0.50%, both significant at the 1% level, whereas the eleven-day mean and median CARs are 1.68% and 0.22%, significant at the 5% and 1% level, respectively. Overall, these results indicate that the market reaction to SWF investments is, on average, positive and significant in both statistical and economic terms. These results are consistent with, but somewhat lower than, those in Dewenter, Han, and Malatesta (2010), who report mean three-day CARs of 1.52% (versus our 0.89%). Our estimates are closer to those reported by Kotter and Lel (2011), who estimate three-day CARs of 2.25%, similar to our

2009; Chambers, Dimson, and Ilmanen 2012), finding that its management, while reporting periodically to the government, is better insulated from political interference than any other SWF leadership team. In terms of investment style, GPFG makes exclusively foreign investments and has always committed to acquiring small stakes—although the exact definition of "small" has varied over time, once signifying no more than 1% of equity, now mostly restricted to below 5%. While GPFG has long been seen as the prototypical passive investor, there are recent signs of increased activism.

estimate of 2.38%, in which Norway is excluded, which is the best comparison as their sample contains only one investment by the Norwegian SWF.

Panel C of Table 4 focuses on the benchmark sample. Three-day mean and median CARs are, respectively, 4.82% and 0.92%, whereas eleven-day mean and median CARs are 7.09% and 2.54%; all CARs are significant at the 1% level. We do not test the statistical significance of differences between the market reaction to SWF investments and the market reaction to benchmark investments here, but note that the difference appears substantial, with the reaction to SWF investments appearing far smaller.

For robustness, we replicate but do not report the same analysis by computing raw (unadjusted, rather than abnormal) returns, market-adjusted abnormal returns, and buy-and-hold (rather than cumulative) abnormal returns. We should note that, for both the SWF and benchmark sample, the mean β parameter estimated in market models is not statistically different from one. Given this, and due to the short event windows involved, the main results are similar, with all samples displaying positive and statistically significant abnormal returns.

4. Decomposing and Explaining the SWF Discount

The descriptive results presented in Section 2 indicate substantial differences between investments by SWFs and investments by private-sector financial investors, both in terms of target firm characteristics and deal characteristics. These differences could, in turn, affect the market reaction, creating potential problems in attributing causation. Accordingly, we first identify potential systematic differences in the investment target selection process by SWFs and then control for those differences by propensity score matching and propensity score-weighted regressions.

4.1 Decomposition of returns into target, deal, and SWF factors

The event-study results suggest that the value impact of SWF investors, while positive, is smaller than that of private sector investors. Yet descriptive statistics also reveal that SWF acquisitions differ significantly from those by private financial investors: SWFs tend to target larger firms (higher total assets) and more profitable firms (higher return on assets) than do PS investors, but they also tend to acquire smaller stakes and assume control less frequently. To formally test the valuation impact of SWFs, while accounting for possible differences in sample composition, we decompose this difference in value impact—which we call, for brevity, a "discount"—into three components, due to target characteristics (target discount), deal characteristics (deal discount), and, most importantly, the fact that the investor is a SWF (SWF discount), respectively. As in the event study, our proxy for the value impact of investments is the three-day cumulative abnormal return surrounding an investment announcement, computed using a market-model, which we refer to simply as the "abnormal return" or "CAR."

Table 5
Decomposition of announcement period abnormal returns

Panel A: All observations

	N	Mean CAR (−1, +1)	*t*
SWF	558	0.50%	0.59
Match1: Random	558	4.03%***	5.70
Match 2: Target characteristics	558	1.10%	1.18
Match 3: Target and deal characteristics	558	1.81%*	1.85
Total discount (SWF - match 1)	558	−3.53%**	−2.70
Target discount (match 2 - match 1)	558	−2.93%**	−2.14
Deal discount (match 3 - match 2)	558	0.71%**	2.45
SWF discount (SWF - match 3)	558	−1.31%***	−3.77
Panel B: Excluding Norway			
SWF	261	2.05%***	4.71
Match 1: Random	261	3.77%**	2.61
Match 2: Target characteristics	261	2.77%***	6.02
Match 3: Target and deal Characteristics	261	3.44%***	4.73
Total discount (SWF - match 1)	261	−1.73%	−1.03
Target discount (match 2 - match 1)	261	−1.00%	−0.59
Deal discount (match 3 - match 2)	261	0.66%	1.06
SWF discount (SWF - match 3)	261	−1.39%*	−1.93

This table includes mean cumulative abnormal stock returns (CARs), in U.S. dollars, for target firms' common equity on the days surrounding the announcement of an investment. Daily abnormal returns are computed using a market model with parameters estimated over 250 trading days ending 20 trading days prior to the investment announcement. Returns are cumulated over the three-day trading period surrounding the announcement of the investment (day 0). Cumulative abnormal returns are computed for the sample of SWF investments for which matched observations and returns data are available. Match 1 is a sample of randomly drawn private sector investments. Match 2 is a sample of private sector investments matched on target characteristics, as described in model 1 in Table A2 in the Appendix. Match 3 is a sample of private sector investments matched on target and deal characteristics, as described in model 2 in Table A2 in the Appendix. Cumulative abnormal returns are winsorized at the 1st and 99th percentiles; means are tested using *t*-statistics computed with standard errors clustered at the SWF level. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level. Panel A includes all announcements of SWF investments in publicly traded companies; panel B includes all announcements of SWF investments in publicly traded companies, but excluding those made by Norway's SWF.

We first estimate the "total discount." To that end, for each SWF investment, we identify a randomly drawn investment from the sample of private sector investments. We then compute the difference between the mean abnormal return for the SWF sample (0.50%) and for this set of randomly matched investments (4.03%). Here, abnormal returns are winsorized at the 1st and 99th percentiles, leading to somewhat smaller abnormal return estimates than the ones presented in Table 4 for both SWF and matched samples. Another difference between the abnormal returns estimated in Tables 4 and 5 originates from the fact that, in Table 5, we only include the 558 SWF investments for which we were able to identify matched observations with nonmissing three-day abnormal returns (we include only observations for which we are able to identify all three sets of matches, as described in more detail below). As reported in panel A of Table 5, the estimated total discount is −3.53%. Cross-sectional *t*-tests with standard errors clustered at the SWF level and robust to heteroskedasticity reveal that the result is statistically significant at the 5% level.

The second step of our return decomposition is to identify a series of matched investments resembling SWFs in terms of target characteristics. To do so, we rely on propensity score matching: we first determine how SWF investments

differ on the basis of observable target characteristics and then pick, for a reduced benchmark sample, private sector investments whose targets most resemble the targets selected by SWFs. Propensity score matching is not new in the empirical corporate finance literature. For example, Campello, Graham, and Harvey (2010) use the technique to investigate the impact of financial constraints on firms: for each "constrained" firm in their sample, they identify a nonconstrained firm matched on size, ownership, ratings, and industry. Fernandes (2014) applies the methodology in a study of the long-term impact of SWF investments on the operating performance of investment targets. Whereas we aim at identifying matched transactions, Fernardes identifies matched firms using country, industry, size, and performance metrics. Accordingly, to model SWF investment preferences, we estimate coefficients of a probit model, in which the response is a binary variable that assumes the value of one when the investor is a SWF and the value of zero when the investor is a non-government-owned financial entity. The set of predictors includes firm and country characteristics. In selecting the exact metrics to use, we attempt to replicate—as much as data availability constraints permit—the set of predictors that previous literature on foreign investors have found meaningful, with an eye on the set of variables utilized by Kotter and Lel (2011). The models include industry and year controls, while standard errors are clustered at the investment-target level.[20] To mitigate the impact of outliers, all continuous variables are winsorized at the 1st and 99th percentiles of the distribution.

Unreported estimation results for a sample of 3,807 SWF and benchmark observations with nonmissing data are included in Appendix Table A2 and indicate that the probability of an acquirer being a SWF increases if the target is large (greater *Total assets*) and if the target is foreign, based in a common-law country, and with abnormally high stock returns over the previous year. Further, the probability of an acquirer being a SWF increases during a banking or financial crisis. These results are consistent with some of the findings of Kotter and Lel (2011), who also document a SWF preference for large targets headquartered in developed countries and for crisis periods. However, while Kotter and Lel (2011) find that SWFs invest in financially constrained firms with weak abnormal stock price performance over the prior year, we find that a strong abnormal stock price performance increases the probability of an acquirer being a SWF, rather than a private-sector financial investor.[21]

[20] The coefficient estimates and statistical significance testing are executed by using SAS and, in particular, the "proc surverylogistic" procedure that employs maximum-likelihood estimates and resampling methods to estimate standard errors in the presence of clustered data and categorical explanatory variables. This allows us to estimate consistent probit coefficients with year and industry controls and test for significance in the presence of clustering. For more information, please refer to http:// support.sas.com/documentation/cdl/en/statug/63033/HTML/default/viewer.htm#statug_surveylogistic_sect001.htm.

[21] While Kotter and Lel (2011) similarly investigate selection criteria in SWF investments, there are substantial differences in the design of our analysis, possibly accounting for differences in findings. Kotter and Lel (2011)

Once we have estimated this probit model, we compute a probability score by fitting the estimated coefficients to the dataset. Finally, we select, with replacement, the private sector investment matched to each SWF investment with the closest probability score.[22] Effectively, we identify a sample of private sector investments that share similar target characteristics to those of SWF investments. To estimate the discount component attributable to target characteristics, we compute the mean difference between abnormal returns on this target-characteristics matched sample and the abnormal returns on the randomly matched sample. The rationale is that any systematic residual difference between the abnormal returns of the two sets of matches should be due to target characteristics. The estimated target discount component is equal to -2.93% (statistically significant at 5%), indicating that target firm characteristics account for a large portion of the total discount.

To compute the discount component attributable to deal characteristics, we repeat the matching procedure described above, but this time we add deal characteristic variables to the probit model (*Stake*, *Control*, *Capital injection*, *First investment*, and *Control*); this reduces the count of observations with nonmissing data to 2,886 and thus identifies a set of private sector investments matched on the basis of both target and deal characteristics. We then compute the mean difference between abnormal returns on this target- and deal-characteristics-matched sample and the abnormal returns on the target-characteristics-matched sample. The rationale is that any systematic residual difference between the abnormal returns of the two sets of matches should be due to deal characteristics. The estimated deal component of the total discount is actually positive, at 0.71%, and also statistically significant at 5%.

Finally, to estimate the component of the discount attributable to SWFs, we compute the mean difference between the abnormal returns on the SWF sample and the target- and deal-characteristics-matched sample. As above, any systematic residual difference (after accounting for target and deal characteristics) is attributable to the identity of the investor. We find that this component, labeled the "SWF discount," is equal to −1.31% and is highly statistically significant.

As in the event study, we are concerned about this SWF discount being driven by investments of the Norwegian GPFG, both because of the small stakes that the fund tends to acquire (which could potentially justify a weaker

aim at identifying a benchmark set of firms, while we focus on a benchmark set of transactions. Accordingly, their benchmark includes all firms in the Worldscope database for which data are available. As we are interested in finding a comparable set of investments, our benchmark sample includes a set of comparable private-sector investments.

22 We verify that the matched transactions are indeed similar to SWF investments by testing for differences in average propensity scores: we find no statistically significant difference in propensity scores between the two samples. Propensity score matching with replacement is recommended by Roberts and Whited (2012). In robustness tests, we also match without replacement. While our findings are virtually identical (we estimate a significant SWF discount of similar magnitude), a comparison of propensity scores between the SWF and matched sample reveals that the matching (without replacement) procedure is not as accurate, as expected.

market reaction) and because of the large proportion of investments related to the Norwegian SWF in our sample. Accordingly, in panel B of Table 5, we replicate the same steps but exclude investments by Norway's SWF and the related matches from our analysis. In this data subset, we estimate a SWF discount of slightly larger magnitude (−1.39%), and it is statistically significant at the 10% level.

These decompositions indicate that, while target characteristics account for a portion of the smaller market reaction observed in conjunction with SWF investments, the residual "SWF discount" is both statistically and economically significant. We should note that our methodology allows us to control for observable systematic differences in target selection and in the structure of SWF investment deals. A limitation, perhaps unavoidable, lies in the fact that we are unable to control for possible unobservable differences in target selection and deal design. Yet, as Campello, Graham, and Harvey (2010) discuss in some detail, matching estimators can mitigate problems related to what they call "uncontrolled firm heterogeneity." That is because, to the extent that relevant unobserved characteristics are likely to be correlated to observed characteristics, unobserved heterogeneity is likely to be lower in a matched sample. Nevertheless, we need to recognize that we cannot, by definition, fully account for the impact of unobserved target and deal characteristics but instead only mitigate their confounding effects.

4.2 Regression analysis of short-term market reactions

The event-study analysis and the return decomposition indicate that the valuation impact of SWFs is smaller than that of private-sector investors, thus suggesting that there is a discount associated with the identity of the investing SWF. This evidence is clearly inconsistent with the hypothesis that SWFs have a more beneficial impact on investment targets than private sector investors because of a hypothetical ability to monitor more effectively the behavior of management. On the other hand, this evidence is consistent with both the political agenda and the passive investor hypotheses, as both predict a discount in firm valuation. We shed light on this issue by examining the determinants of the abnormal market reaction using regression analysis to discriminate between these two competing predictions.

As the descriptive analysis reveals, SWF investments are not random. Rather, SWF investments differ systematically from private investments, both in terms of target and deal characteristics. To minimize the impact of this selection process on the analysis presented here, coefficients are estimated by a weighted least squares procedure in which the weights are inversely proportional to the probability of an investment belonging to the SWF or benchmark sample.[23] For each transaction, the "propensity score" $\hat{p}$ is an estimate of the conditional

[23] Caliendo and Kopening (2008) discuss applications of propensity-score-weighting techniques and the related literature.

probability of finding that the acquirer is a SWF, derived from the probit model discussed in Section 3 and Appendix Table A2. A transaction with a SWF acquirer receives a weight w so that $w = 1/\hat{p}$, whereas a transaction with private-sector acquirers receive a weight w so that $w = 1/(1-\hat{p})$. Intuitively, propensity score weighting assigns a lower weight to SWF observations, which are "very different" (in terms of target and deal characteristics) from the benchmark sample and, similarly, gives a lower weight to benchmark observations, which are "very different" from the SWF sample, effectively reducing the impact of sample selection on the coefficient estimates.

In our regression model, the response variable is the three-day, market-model adjusted, cumulative abnormal return, as described in Section 3. The first predictor of interest is a binary variable equal to one for investments by SWFs and zero otherwise. The coefficient associated with this variable offers an estimate of the discount associated with SWF investments. While the superior monitor hypothesis (SMH) and passive investor hypothesis (PIH) predict that the market reaction to SWF investments will be stronger for domestic deals, because the funds will be able to exercise better monitoring and receive less pressure toward passivity, the political agenda hypothesis (PAH) predicts that the value impact of SWFs will be lower domestically, as SWFs are more able to exercise a potentially value-decreasing political influence. Accordingly, we include an interaction between the SWF binary variable and a binary variable identifying foreign investments. As we add an interaction between this SWF identifier and a binary variable identifying foreign investments (*SWF* × *Foreign*), the coefficient estimate associated with *SWF* should be interpreted as an estimate of the discount associated with SWF domestic investments, whereas the discount associated with SWF foreign investments should be estimated by the sum of that coefficient and the coefficient on the *SWF* × *Foreign* interaction. As all of the hypotheses predict a relation between the valuation impact and the stake acquired by the SWF, we also interact the SWF identifier with the size of the stake acquired. Further, to test whether the impact of SWFs on firm valuation is conditional on the presence of other block holders, we add an interaction between the proportion of closely held shares and the SWF binary variable. Finally, given that SWFs could be pushed into a more passive stance if originating from a nondemocratic country, potentially viewed as threatening, we add an interaction between an index of country democracy and the SWF binary variable.

As additional control variables, we add a series of variables that extant literature has documented affecting the market reaction around investment announcements for all (not just SWF) investors: deal based variables (*Foreign*, *Capital injection*, and *Stake*), target-level controls (*Total assets*, *Return on assets*, *Closely held shares*, *Debt to assets*, and *Market to book*), and buy-and-hold abnormal returns computed over the year prior to the announcement of the SWF investment. We also add country-level controls (*GDP growth*, log of *GDP per capita*, *Market cap to GDP*, *Target country democracy*, and *Target*

country common) and a binary variable identifying banking crises (*Crisis*). Industry, country, and year fixed-effects are included, and standard errors are clustered at the investment-target and year levels. As in previous analyses, to mitigate the impact of outliers, all continuous variables are winsorized at the 1st and 99th percentiles of the distribution.

We present results of this regression analysis in Table 6. We have complete data for 391 SWF observations and for 1,114 benchmark observations.[24] As the first model presented in Table 6 reveals, the coefficient estimate associated with the SWF variable is negative and highly statistically and economically significant, indicating a discount of approximately −5.28% associated with domestic SWF investment. On the other hand, the coefficient estimate associated with the *SWF* × *Foreign* interaction is 4.74%. Hence, while domestic SWF investments are associated with a much lower market reaction than are private-sector investments (a discount of −5.28%), the estimated discount is smaller for foreign SWF investments: −0.54% (the sum of the two coefficients, −5.28% and 4.74%). This deeper discount for domestic deals is consistent with the political agenda hypothesis, as we expect SWFs to be under greater pressure to pursue political goals (such as employment maximization or the development of specific sectors) when investing domestically.

In a second model, we add two binary variables identifying specific SWF types: Norway and "political" SWFs, classified as described in Section 2. We further add interactions with these two binary variables as we previously did for the SWF identifier. The model thus estimated confirms the previous findings, but leads to a more nuanced effect on the interaction with *Stake*. While the size of the stake acquired is positively related to the market reaction when the investor is the Norwegian SWF, it is negatively related to the market reaction when the investor is a "political" fund and is not related to the size of the stake acquired by other SWFs. This result is also highly consistent with the PAH, as it points to the fact that the discount is a feature of domestic investments and of investments by political funds (domestic and foreign). Finally, we note that the interaction between the Norway identifier and *Closely held shares* is associated with a positive and statistically significant coefficient, suggesting that, in the presence of other blockholders, investments by the Norwegian SWF lead to a higher market reaction. While the result is statistically significant, the coefficient is fairly small, indicating limited economic significance.

In the third model, we replace the binary variable identifying political SWFs with the *Political Index* discussed in Section 2. We find that the interaction between this index and *Stake* is associated with a negative and significant

[24] In unreported analyses, we test the representativeness of the sample subset of SWF investments with complete regression data. The event-study analysis offers mixed results, as the market reaction is close to zero (negative but not statistically significant) over the standard three-day event window but is positive (circa 0.50%) and statistically significant on the announcement day. Most importantly, we take reassurance in finding that the discount decomposition indicates a total discount of −4.39% and a SWF discount of −0.54%.

Table 6
Regression analysis of short-term market reactions, full sample

Variable	Model 1 CAR (−1,+1)	Model 2 CAR (−1,+1)	Model 3 CAR (−1,+1)	Model 4 CAR (−1,+1)
Intercept	−1.1212**	−0.7880	−0.931**	−0.4838
	(−2.48)	(−1.54)	(−2.06)	(−0.97)
SWF	−0.0528***	−0.0538**	0.0231	−0.0716***
	(−2.62)	(−2.44)	(0.31)	(−3.28)
SWF Norway		0.0059	−0.0649	0.0480
		(0.12)	(−0.86)	−0.98
SWF political index		0.0072	−0.07	−0.01
(*SWF political index in Model 3*)		(0.09)	(−1.04)	(−0.11)
Foreign	−0.0192	−0.0214	−0.0224*	−0.0238*
	(−1.53)	(−1.63)	(−1.73)	(−1.82)
SWF × *Foreign*	0.0474**	0.057**	0.0363	0.0913***
	(2.22)	(2.11)	(0.51)	(3.33)
SWF political dummy		−0.0601	0.01	−0.0100**
(SWF political index in Model 3) × *Foreign*		(−1.13)	(0.2)	(−2.09)
Stake (*Control in Model 4*)	0.0016***	0.0016***	0.0015***	0.0760***
	(6.73)	(6.53)	(6.52)	−5.88
SWF × *Stake* (*Control in Model 4*)	0.0003	0.0007	0.0024**	0.1030***
	(0.55)	(1.11)	(2.47)	(3.15)
SWF Norway × *Stake* (*Control in Model 4*)		0.0195*	0.018*	NA
		(1.88)	(1.75)	NA
SWF political dummy (SWF political index		−0.0028***	−0.0018***	−0.2754***
in M3) × *Stake* (*Control in M4*)		(−4.05)	(−3.94)	(−6.26)
CHS	∼−0.0001	∼−0.0001	∼−0.0001	∼−0.0001
	(−0.11)	(−0.08)	(−0.08)	(−0.25)
SWF× *CHS*	0.0002	−0.0001	−0.0007*	−0.0007***
	(0.76)	(−0.31)	(−1.81)	(−2.60)
SWF political dummy		0.0002	0.0008	0.0015***
(SWF political index in Model 4) × *CHS*		(0.5)	(1.64)	−2.82
SWF Norway × *CHS*		0.001**	0.0007**	0.0008*
		(1.97)	(2.46)	−1.94
Acquirer country democracy	0.0004	0.0003	0.0003	−0.0002
	(0.39)	(0.3)	(0.25)	(−0.20)
SWF × *Acquirer country democracy*	0.0008	−0.0010	0.0006	−0.0050
	(0.52)	(−0.29)	(0.14)	(−1.29)
SWF political dummy		−0.0027	∼−0.0001	∼−0.0001
(SWF political index in M3) ×		(−0.25)	(−0.93)	(−0.12)
Acquirer country democracy				
Observations, benchmark	1114	1114	1114	1114
Observations, SWFs	391	391	391	391
Adj. R^2	67.65%	67.96%	70.05%	68.36%

This table includes coefficient estimates obtained by weighted least-squares optimization with propensity-score-derived weights, as in Caliendo and Kopening (2008). The response variable is the market-model cumulative abnormal return over the three-day window surrounding an investments announcement. All predictors are as described in Table A1 in the Appendix. Industry, target country, and year fixed effects are included, as well as additional controls for deal characteristics (*First investment* and *Capital injection*), time-varying firm characteristics (log of *Total assets*, *Return on assets*, *Debt to assets*, *Sales growth*, *Quick ratio*, and *Buy-and-Hold abnormal return* over the previous year) and target country metrics (*GDP Growth,* log of *GDP per capita*, *Market cap to GDP*, *Target country democracy*, *Target country common,* and *Crisis*), but related coefficient estimates are omitted. In model 3, the *SWF political dummy* is replaced by the *SWF political index* (also in related interactions). In model 4, *Stake* is replaced by *Control* (also in related interactions). Standard errors are robust and clustered by investment target and year; *t*-statistics are reported below the coefficient estimates. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level.

coefficient, confirming our previous findings. Yet, in this model, we find that the interaction between the SWF identifier and *Stake* has a positive and significant coefficient estimate, while the SWF identifier and its interaction with the *Foreign* binary variable do not appear significant.

In a fourth model, we once more replicate the specification of the second model, but replace the continuous *Stake* variable with a binary *Control* variable, set equal to one when the size of the stake owned by the investor after the announced transaction exceeds the 51% threshold. The results once more confirm our previous findings but also reveal the dramatic impact of assuming control of a SWF. While we find that a nonpolitical SWF assuming control is associated with an abnormally positive market reaction (similar in size, but greater in magnitude, than the effect associated with a private-sector investor), the estimated marginal effect of a political SWF assuming control is a decrease in the market reaction by a dramatic −27.54%.[25] These results strongly support, once more, the contention that the SWF discount is driven by their political interference, which is more pressing domestically and when SWF management is not truly independent. We should also note that we find that the market reaction to SWF investments appears negatively related to *Closely held shares* for nonpolitical SWFs, but that relation is positive if the acquirer is a political SWF or Norway. In the models discussed, the *Acquirer country democracy* variable is never significantly related to abnormal returns, either on its own or in any of the interactions.

In additional cross-sectional analysis, we focus on a data subset: as described in Section 4.1 above, we use propensity score matching to generate a sample of private sector investments that is a close complement to the SWF sample after adjusting for differences in deal and target characteristics. The purpose is twofold. First, we aim at mitigating even further (in addition to the propensity score weighing of coefficient estimates) sample selection issues. Second, we aim to add to our analysis an important explanatory variable: a binary variable equal to one if the investor (SWF or matched sample) acquires a seat on the board of directors of the target firm, and zero if not. Given the necessity to collect this data manually, we restrict our effort to the sample of SWF investments and to the matched sample, rather than to the entire universe of benchmark investments.

In the first model of Table 7, we return to the first model presented in Table 6 (not including identifiers for Norway nor political funds) and add to it a binary variable identifying acquirers obtaining seats on the board of directors (*Director*) and interactions between this variable and the SWF identifier (*SWF* × *Director*), between Director and Stake (*Stake* × *Director*), and the three-way interaction *SWF* × *Director* × *Stake*. In this model, we find that the only statistically significant result of interest is this three-way-interaction, indicating that the negative market reaction is driven by SWF investments in which SWFs obtain seats on the board of directors and is related, under those circumstances, to the size of the stake acquired by the SWF. Economically, we estimate

[25] We are unable to estimate the impact of Norway's SWF assuming control, as that does not occur in our sample. Similarly, in subsequent models, we are unable to estimate the impact of Norway's SWF appointing a director to the board, for the same reason.

Table 7
Regression analysis of short-term market reactions, SWF investments and matched sample

Variable	Model 1 CAR (−1,+1)	Model 2 CAR (−1,+1)	Model 3 CAR (−1,+1)	Model 4 CAR (−1,+1)
Intercept	−2.5796***	−2.4329***	−2.0705***	−1.9154***
	(−3.65)	(−2.95)	(−2.95)	(−2.25)
SWF	−0.0035	0.0048	−0.0352	−0.0061
	(−0.13)	(0.17)	(−0.33)	(−0.25)
SWF Norway		0.0263	−0.0637	0.0467
		(0.56)	(−0.88)	0.97)
SWF political index		−0.0845	0.0401	−0.0937
(*SWF political index in Model 3*)		(−0.93)	(0.39)	(−1.02)
Foreign	0.0037	0.0023	0.0032	0.0045
	(0.16)	(0.1)	(0.14)	(−0.21)
SWF × *Foreign*	0.0157	0.0031	0.1095	0.0199
	(0.53)	(0.1)	(1.06)	(−0.65)
SWF political dummy (*SWF political index in Model 3*) × *Foreign*		0.0453	−0.1058	0.0283
		(0.81)	(−1.07)	−0.49
Stake (*Control in Model 4*)	0.0015***	0.0013***	0.0013***	0.0947***
	(3.28)	(3.05)	(3.09)	−3.12
SWF × *Stake* (*Control in Model 4*)	−0.0002	0.0001	0.0012	0.0116
	(−0.28)	(0.14)	(1.49)	−0.31
SWF Norway × *Stake* (*Control in Model 4*)		0.0266***	0.025***	*NA*
		(2.8)	(2.62)	*NA*
SWF political dummy (SWF political index in M3) × *Stake* (*Control in M4*)		−0.0017***	−0.0011***	−0.1895***
		(−2.98)	(−3.15)	(−4.29)
Director	0.0187	0.0118	0.0076	0.0119
	(0.47)	(0.33)	(0.22)	−0.35
SWF × *Director*	−0.0406	−0.0746*	−0.092*	−0.0734*
	(−0.97)	(−1.71)	(−1.72)	(−1.66)
SWF political dummy (SWF political index in Model 3) × *Director*		0.0378	0.0231	0.0366
		(0.93)	(0.98)	−0.85
SWF × *Stake*× *Director*	−0.0017***			
	(−2.67)			
CHS	∼0.0001	∼0.0001	∼0.0001	∼0.0001
	(1.19)	(0.97)	(0.96)	−1.01
SWF× *CHS*	−0.0003	−0.0006***	−0.0016***	−0.0009***
	(−1.24)	(−3.34)	(−4.7)	(−4.81)
SWF Norway × *CHS*		0.0007*	0.0017***	0.0009*∗
		(1.86)	(3.47)	−2.52
SWF political dummy (*SWF political index in Model 3*) × *CHS*		0.0016***	0.001***	0.0018***
		(2.9)	(3.78)	−3.28
Acquirer country democracy	0.0013	0.0021*	0.0023*	0.0017
	(1.03)	(1.67)	(1.77)	−0.12
SWF × *Acquirer country democracy*	−0.0016	−0.0059	−0.0034	−0.0057
	(−0.94)	(−1.52)	(−0.81)	(−1.43)
SWF political dummy (SWF political index in M3) × *Acquirer Country Democracy*		0.0013	−0.0029	0.0012
		(0.13)	(−0.72)	−0.12
Observations, matched	143	143	143	143
Observations, SWFs	391	391	391	391
Adj. R^2	89.07%	89.45%	89.62%	89.82%

This table includes coefficient estimates obtained by weighted least-squares optimization with propensity-score-derived weights, as in Caliendo and Kopening (2008). The response variable is the market-model cumulative abnormal return over the three-day window surrounding an investments announcement. All predictors are as described in Table A1 in the Appendix. Industry, target country, and year fixed effects are included, as well as additional controls as listed in Table 6, but related coefficient estimates are omitted. Models 3 and model 4 are constructed as in Table 6. Standard *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level.

that, when a SWF appoints a director, for each percentage point increase in *Stake* the market reaction declines by 0.1 percentage points. This evidence points, once more, strongly to an active role of SWFs—the discount, being

specific to SWFs appointing directors, does not appear to be the result of a passive role.

In the second model, we once more add the identifiers for Norway and for political SWFs, and the related interactions. We interact the political SWF identifier with *Directors*, but we do not do so for Norway, as the latter SWF does not acquire seats on boards in any of the observations in our sample. We once more find that the size of the stake acquired is positively related to the market reaction if the acquiring SWF is Norwegian, but negatively related to the size of the stake acquired if the acquiring SWF is classified as political. We further find that the market reaction is lower when the acquiring SWF appoints a director; yet, while the coefficient estimate indicates that a SWF acquiring a seat leads to a drop in abnormal return, the result is only statistically significant at the 10% level. Finally, we confirm the findings from Table 6 regarding the relation between SWF types and *Closely held shares*.

In the third and fourth model we replicate the analysis presented in Table 6, by first replacing the binary identifier for political SWFs with the political index and then by replacing the *Stake* variable with the binary *Control*. For the sake of brevity, we do not discuss these results in detail, as they largely confirm our previous findings, although the estimated impact of SWFs acquiring seats is −9.20% and −7.34%, respectively. Finally, in contrast to the previous results, the *Acquirer country democracy* variable has a significantly (10% level) positive coefficient in two of four specifications for all financial investors, though never for SWFs specifically. This suggests that investors generally prefer acquirers from democratic societies over those from authoritarian ones, though the effect is not different for SWFs rather than private sector investors, nor does it differ across SWF types.

As before, these results offer support for the political agenda hypothesis, and refute the predictions of either the passive investor hypothesis or the monitoring investor hypothesis.

5. Long-Term Operating Performance

Given the low level of transparency of SWFs and the scarce understanding of this relatively young class of institutional investors by the general public, it is plausible that the announcement-period market reaction might not accurately and fully incorporate the valuation effects of SWFs. Accordingly, to test whether the results we document for the announcement window (the discount associated with SWF investments) is an accurate reflection of the long-term effect, we analyze changes in measures of profitability (proxied by *Return on assets*), growth (*Sales growth*), and valuation (*Market to book*) over one, two, and three years following the SWF investment. Effective monitoring should lead to an increase in profitability, growth rates, and valuation metrics; on the other hand, both the PAH and PIH predict a decline in these variables. We further note that the presence of a sovereign investor could give the firm preferential

access to capital from state-owned banks, thus possibly increasing leverage (measured by the *Debt-to-assets* ratio) and that a sovereign investor might be risk adverse and thus cause the firm to decrease leverage or maintain higher levels of liquidity (measured by the *Quick ratio*). We benchmark the impact of SWFs on investment targets to the set of private sector investments identified via propensity score matching on the basis of both target and deal characteristics. We present difference-in-differences tests in Section 5.1 and cross-sectional analysis in Section 5.2.

5.1 Operating performance of SWF investment targets and private-sector-matched investments

As noted, for each variable of interest, we compute changes over the one, two, and three years following investment by the SWF. For example, in estimating the change in *Return on assets* (*ROA*) over the year following the SWF investment (say, for example, an investment that occurs during the year 2010), we compute the difference between the value of the variable as of the end of the calendar year following the investment (December 31, 2011) and the end of the year preceding the SWF investment (December 31, 2009). We proceed similarly over the two and three-year horizons and for all other variables. As in previous analyses, to mitigate the impact of outliers, all continuous variables are winsorized at the 1st and 99th percentiles of the distribution. We test the significance of these changes using t-tests with standard errors clustered at the target firm level. We also compute changes in operating performance variables for the matched sample identified in Section 4 and Appendix Table A2 based on both target and deal characteristics. Finally, we compute difference-in-differences statistics by subtracting changes in the variable of interest for the matched sample from changes for the SWF sample. We present our findings in Table 8. The exact sample size used in each test is indicated in the table, but, in general, the number of available observations shrinks over the longer time horizons (sample sizes in this table range from 631 to 169). Survivorship biases raise questions about the interpretation of absolute performance analysis, yet, as long as survivorship biases affect our SWF and matched samples in a similar fashion, the analysis of relative performance, which is our main point of interest, should lead to valid inference.

We find that SWF targets experience a decline in profitability over all time horizons: *Return on assets* declines by 2.31 percentage points over one year, 1.13 over two, and 1.76 over three. In contrast, we find no statistically significant change in *Return on assets* for the matched sample. The difference-in-differences is statistically significant for the two-year (at the 1% level) and three-year (at the 10% level) horizons. Kotter and Lel (2011) likewise observe a decline in *Return on assets* for SWF targets, yet they find a similar decline in in a sample of firms matched by country, industry, and profitability—which again emphasizes how proper benchmarking affects the inference from these tests.

Table 8
Difference-in-differences analysis of long-term performance changes after investment

Variable (mean change relative to the year prior to the investment)	Year	SWFs (1)	Matched sample (2)	Difference-in-differences (1)-(2)	Obs
Return on assets	1	−2.31%***	−0.63%	−1.68%	517
		(−3.7)	(−0.7)	(−1.47)	
	2	−1.13%**	5.88%***	−7.01%***	445
		(−1.97)	(5.4)	(−5.59)	
	3	−1.76%**	0.87%	−2.63%*	266
		(−2.4)	(0.62)	(−1.69)	
Sales growth	1	−8.63%***	−0.28%	−8.35%***	284
		(−3.82)	(−0.25)	(−3.19)	
	2	−12.17%***	−11.32%***	−0.85%	360
		(−5.84)	(−7.15)	(−0.33)	
	3	−8.89%***	3.42%**	−12.30%***	189
		(−3.76)	(2.27)	(−4.49)	
Market to book	1	−1.60***	0.04	−1.63***	496
		(−6.63)	(0.22)	(−5.59)	
	2	−1.32***	−0.31**	−1.01***	430
		(−4.98)	(−2.1)	(−3.37)	
	3	−1.33***	−0.72***	−0.61	261
		(−3.4)	(−3.34)	(−1.36)	
Quick ratio	1	0.25**	0.35**	−0.10	350
		(2.03)	(2.48)	(−0.52)	
	2	0.14*	0.37**	−0.23	305
		(1.66)	(2.34)	(−1.3)	
	3	0.06	−0.07	0.13	169
		(0.57)	(−0.53)	(0.75)	
Debt to assets	1	−0.22%	5.29%***	−5.51%***	631
		(−0.34)	(7.47)	(−6.23)	
	2	−0.72%	4.98%***	−5.71%***	490
		(−1.07)	(6.62)	(−5.99)	
	3	−0.94%	1.81%**	−2.75%**	426
		(−1.13)	(2.16)	(−2.31)	

This table presents mean changes (differences) in *Return on asset*s, *Sales growth*, *Market to book*, *Quick ratio*, and *Debt to assets* (as defined in Table A1 in the Appendix) for both the sample of SWF investments and for the sample of matched private sector investments (using the matching algorithm based on both target and deal characteristics derived from model 2 presented in Table A2 in the Appendix). Variables are measured as of Dec. 31 of each year. The base value is as of Dec. 31 of the year preceding the investment. The difference reported for year 1 is the difference between the value as of Dec. 31 of the year following the investment and Dec. 31 of the year preceding the investment and values for years 2 and 3 are similarly computed. Mean difference-in-differences values are computed as the difference between the mean change for the SWF sample and the mean change for the matched sample. The statistical significance of mean differences is tested with t-tests with standard errors clustered at the target level; t-statistics are reported below the means. Obs. reports the number of observations used in computing the mean difference-in-differences. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level.

Similarly, we find a statistically significant decline in *Sales growth* for SWF investment targets over all time horizons and the effect is economically important: a decline of 8.89 percentage points over three years. Difference-in-differences tests are significant over the one- and three-year windows. Finally, we find the *Market-to-book* ratio showing a statistically significant decline over all time horizons. However, we also observe a decline in *Market to book* for the matched sample over the two- and three-year horizon. The difference-in-differences is negative and statistically significant overt the one- and two-year horizons, but not over the three-year horizon.

The decline in profitability, growth rates, and valuations relative to the matched sample is consistent with the political agenda hypothesis and the

passive investor hypothesis, but not with the monitoring investor hypothesis. We further find evidence of increased liquidity for both SWF targets and for the matched sample, but the results are statistically and economically weak and difference-in-differences tests are not significant. Finally, while we find a slight decline, economically tiny and statistically not significant, in leverage (as measured by *Debt to assets*) for the SWF sample, the matched sample displays a significant increase. The difference-in-differences is negative and statistically significant at all three time horizons, indicating a decline in leverage for SWF investment targets relative to private-sector targets.

Given the skewed distribution of operating performance variables, we replicate, but do not report in detail, the same analysis by focusing on sample medians rather than means. The inference we draw is virtually identical, pointing to deteriorating performance of SWF investment targets, no changes in liquidity, and lower leverage.

5.2 Cross-sectional analysis of operating performance

While the difference-in-differences analysis provides robust evidence of deterioration in the performance of SWF investment targets, strongly suggesting that SWFs do not play a value-enhancing monitoring role in their investment targets, it does not allow us to discriminate between the political agenda and the passive investor hypotheses, as both predict deteriorating profitability, growth, and valuation. Accordingly, we examine the determinants of this decline using regression analysis. We fit the same model described in Section 4, but using as response variables *Returns on assets*, *Sales growth*, and the *Market-to-book* ratio as of the end of the third year following the SWF investment. The respective values as of the year prior to the investment are included as controls. As before, we estimate coefficients using weighted least squares based on propensity scores and include only matched observations, to minimize the impact of SWF selection. Standard errors are clustered at the target and year level and are robust to heteroskedasticity. As before, we also include country, year, and industry fixed effects in all models.

In estimating the impact on *Return on assets*, we find that the coefficient estimate associated with the interaction between the political SWF identifier and the stake acquired is negative and statistically significant (at the 10% level). For every percentage point stake acquired by a political SWF, *Return on assets* declines by 0.1 percentage points, which is consistent with the PAH. On the other side, all other coefficient estimates related to the impact of SWFs are not statistically significant.

In estimating the impact on *Sales growth*, we find that the binary variable identifying SWF investors has a negative and significant (at the 5% level) coefficient, indicating that, over three years, *Sales growth* of SWF targets declines by a dramatic 25 percentage points. Even more, the interaction between the political SWF identifier and the stake acquired is negative and statistically significant (at the 5% level). For every percentage point stake acquired by

a political SWF, *Sales growth* declines by 0.34 percentage points, which is consistent with the PAH. The other explanatory variables interacted with the SWF binary identifier are not statistically significant. Finally, our regression analysis analyzing changes in the *Market-to-book* ratio leads to no statistically significant coefficient estimates for the variables of interest.

Overall, the cross-sectional regression analysis of operating performance offers only limited evidence, since the explanatory power of the models appears weak, perhaps due to the high level of noise and the general difficulty of modeling changes in operating performance. Nevertheless, the statistically significant results that we do document point to deterioration in *Return on assets* and *Sales growth* being related to the size of the stake acquired by "political" SWFs: the larger the stake acquired by a fund subject to political interference, the lower future profitability and growth. These results point in the direction of the political agenda hypothesis, rather than the passive investor hypothesis.

In unreported additional tests, we re-estimate the same models using quantile regressions, effectively estimating the conditional medians (rather than means, as in the weighted-least-squares regressions presented above). The results remain robust, indicating that the stake acquired by political SWFs is related to lower *Return on assets* and *Sales growth*.

6. Explaining the Positive Market Reaction at Announcement

Our main interest lies in the relative performance of SWF investment targets as compared to similar targets of investments by private-sector financial firms. However, we cannot ignore the fact that the positive market reaction at announcement of SWF investments is not consistent with subsequent deterioration in operating performance.[26] One possible explanation of this apparently irrational market reaction is that the impact of SWFs is not well understood due to their novel and opaque nature. In this case, we would expect this positive market reaction to weaken, or disappear, over time, as more studies of SWF impact have emerged. In unreported analysis, we split the sample into two sub-periods, based on announcement date of the investment, but find no evidence of a weaker market reaction in recent years. We further note that this positive market reaction, without subsequent improvement in the long term, is not specific to SWFs. While private-sector investments in our sample display a positive market reaction, but no subsequent long term performance improvement, in the SWF sample a positive market reaction is followed by deterioration in operating performance. Nevertheless, this inconsistency is not a feature of SWF investments, but has been documented by the above literature on takeover expectations, as well as by studies of equity offerings (for example, Hertzel et al. 2002). Overall, the patterns we observe are most consistent with Mikkelson

[26] We thank an anonymous referee for suggesting this line of inquiry.

and Ruback (1985), who find that the positive return for target firms around corporate investments is due to the expectation of a takeover that often follows corporate block investments. Their findings have been echoed in a stream of other papers, most recently by Greenwood and Schoar (2009). This "takeover expectation" hypothesis reconciles the observed positive market reaction with the lack of a subsequent operating performance improvement that we observe in all (SWF and benchmark private-sector) investments in our sample, as the market reaction is due to the expectation of a takeover premium payment, rather than to anticipated improvements in firm operational performance.

To further test this hypothesis, in unreported analysis, we split the SWF sample into two subsets, respectively encompassing investments in stakes greater than (or equal to) 5%, or less than 5%. Consistently with the literature on takeover expectations, we find that both SWF investments and private-sector investments elicit a positive market reaction when the size of the stake acquired is greater than (or equal to) 5%. The market reaction to SWF investments is 2.62%, while the market reaction to private-sector investments matched by both target and deal characteristics is 4.14%. The estimated "SWF discount" is 1.52%, which is greater, in magnitude, than the discount associated with the overall sample, but the result is not statistically significant, perhaps due to the smaller sample size. On the other hand, for the sample of acquisitions of stakes below 5%, we observe a negative market reaction associated with SWF investments (−0.55%) and a positive, but much smaller, market reaction to private-sector investments (0.60%). The SWF discount in this sample is −1.15% and is significant at the 1% level.

Accordingly, our interpretation of the results is that all investments (private sector or SWF originated) lead to a positive market reaction when the size of the stake is large enough to indicate a likely future takeover. Yet, aside from this common effect to all investments, SWFs have other, incremental, effects on firm value. Based on our analysis, what differentiates SWF from private sector investments is the risk of political interference, which results in a relatively lower market reaction at announcement and operating performance over the longer term.

7. Conclusions

Sovereign wealth funds are key actors in the global financial landscape. Yet, given their high level of heterogeneity and general lack of transparency, extant research has provided an incomplete view of their impact. Host governments have argued that SWFs are managed independently to invest in a diverse set of asset classes in pursuit of commercial returns. Being supposedly controlled at arms' length by their sponsoring governments, SWFs should operate as any other financial investor and no differences should emerge between the financial performance of targets acquired by SWFs and by private institutional investors. This study questions that view and finds that the sovereign nature of the

Table 9
Regression analysis of long-term operating performance

Variable	Return on assets (Year 3)	Sales growth (Year 3)	Market to book (Year 3)
Intercept	−104.76	85.56	32.34
	(−0.58)	(0.27)	(0.75)
SWF	−5.32	−25.63**	1.89
	(−0.98)	(−2.03)	(0.99)
SWF Norway	6.37	−12.55	7.29
	(0.61)	(−0.42)	(1.6)
SWF political index	52.51	72.89	−6.77
	(1.23)	(0.67)	(−0.63)
Foreign	2.45	2.01	0.48
	(0.62)	(0.23)	(0.54)
SWF × *Foreign*	3.63	12.14	−3.18
	(0.71)	(0.94)	(−1.56)
SWF political dummy × *Foreign*	−40.05	−30.10	9.36
	(−1.03)	(−0.29)	(0.86)
Stake	−0.06	−0.39	−0.01
	(−0.33)	(−1.01)	(−0.38)
SWF × *Stake*	0.10	0.44	−0.03
	(0.58)	(1.02)	(−0.88)
SWF Norway × *Stake*	−3.47	−1.86	0.30
	(−1.47)	(−1.01)	(0.71)
SWF political dummy × *Stake*	−0.11*	−0.34**	0.01
	(−1.69)	(−2.11)	(0.17)
Director	−0.31	0.71	−0.67
	(−0.07)	(0.05)	(−0.56)
SWF × *Director*	−0.26	−6.01	−0.60
	(−0.06)	(−0.41)	(−0.36)
SWF political dummy × *Director*	9.55	−10.17	3.28
	(1.48)	(−0.44)	(1.37)
CHS	0.00	−0.01	∼−0.01**
	(−0.55)	(−0.81)	(−2.25)
SWF× *CHS*	0.09	−0.23	0.04
	(1.54)	(−1.51)	(0.96)
SWF Norway × *CHS*	−0.10	0.04	−0.06
	(−1.34)	(0.22)	(−1.21)
SWF political dummy× *CHS*	−0.13	0.08	−0.03
	(−1.31)	(0.3)	(−0.68)
Acquirer country democracy	0.30	−0.73	0.06
	(1.08)	(−1.14)	(0.91)
SWF × *Acquirer country democracy*	0.47	1.12	−0.46
	(0.6)	(0.46)	(−1.42)
SWF political dummy× *Acquirer country democracy*	0.36	4.57	0.56
	(0.2)	(0.66)	(0.98)
Observations, matched sample	89	87	88
Observations, SWFs	321	321	321
Adj. R^2	35.31%	44.35%	22.47%

This table includes coefficient estimates obtained by weighted least-squares optimization with propensity-score-derived weights, as in Caliendo and Kopening (2008). The response variables are *Return on assets* (first column), *Sales growth* (second column), and *Market to book* (third column), all as of December 31 of the third year following the related investment. All predictors are as described in Table A1 in the Appendix. Industry, target country, and year fixed effects are included, as well as additional controls for deal characteristics (*First investment* and *Capital injection*), time-varying firm characteristics (log of *Total assets*, *Debt to assets*, *Sales growth*, *Quick ratio*, and *Buy-and-Hold abnormal return* over the previous year) and target country metrics (*GDP Growth,* log of *GDP per capita*, *Market cap to GDP*, *Target country democracy*, *Target country common,* and *Crisis*), but related coefficient estimates are omitted. Standard errors are robust and clustered by investment target and year; *t*-statistics are reported below the coefficient estimates. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level.

investing SWFs negatively affects target firm value and operating performance, relative to private-sector investors.

While markets react positively to the news of any investment by a financial investor, the purchaser being a SWF leads to a weaker (albeit, on average, still positive) reaction indicative of a "SWF discount." Further, SWF investments lead to deteriorating long-term operating performance, both in absolute terms and relative to private-sector investments. These results are robust to controls for target selection preferences by SWFs and for a large set of control factors at the country, year, industry, firm, and deal level.

Market reactions are affected by behavioral and structural characteristics of the funds. Particularly, the extent of activism by the SWF plays an important role, as larger discounts are associated with the presence of the SWF on the board of directors of the target company in combination with larger stakes acquired. Our results thus provide support to the view that a higher profile in the corporate governance of the investee company by the SWF destroys firm value. However, we also show that the governance structure of the SWFs matters, in that larger discounts and deteriorating performance are associated with large investments by highly politicized SWFs, such as those under strict government oversight. Consistently, investments by Norway's GPFG are not associated with a discount, as it is widely seen as a more sophisticated and nonthreatening investor than many of its peers.

A few caveats are in order. First, our research offers insights into the impact of SWFs on the value and performance of the publicly traded firms in which they invest. There are reasons to believe that, lacking the transparency and market oversight of public firms, political influences and pressure would be even stronger on privately held (unlisted) entities. While it would be desirable to investigate the impact on private firms, data limitations prevent us from doing so, yet we note this would be an interesting topic for future research. Second, we note that the underperformance of investment targets does not provide conclusive evidence regarding the performance of SWF investment portfolios. While we have anecdotal evidence, and incomplete data, backing the assertion that SWFs are long-term investors, we have no comprehensive dataset on divestments. Further, the exact price per share paid at the time of investment is often withheld from the public; while using the contemporaneous market price is an acceptable approximation in gauging the impact on the firm, it is not usable in evaluating the return on investment earned by SWFs. Lacking a clear divestment date and exact transaction value, it is impossible to precisely estimate returns on SWF portfolios. Finally, we caution against applying our findings of a political-interference discount too broadly. We stress that SWFs are a heterogeneous group: while some have failed to develop the internal governance structures necessary to insulate management from political interference, others have succeeded. Anecdotal evidence indicates that the successful institutional design exemplified by Norway's GPFG is already being cited as a model to emulate by a number of countries which are considering starting their own SWFs.

Appendix

Table A1
Description of the explanatory variables used in the empirical analyses

Variable	Source	Definition
Deal value	SIL SWF Database/SDC	Total value of the equity investment, in 2000 U.S. dollars (adjusted using the consumer price index, CPI)
Stake	SIL SWF Database/SDC	Proportion of the investment target equity acquired in the deal by the SWF
Stake owned	SIL SWF Database/SDC	Size of the stake owned by the SWF in the investment target after the transaction
Control	SIL SWF Database/SDC	Binary variable, equal to one if the "Stake owned" exceeds 50%
Acquirer country democracy/Target country democracy	Polity IV Project	"Democracy" minus "Autarchy" score for the relevant country
Target country common	La Porta et al. (1998)	Binary variable, equal to one if the relevant country is of common law origin
Crisis	Laeven and Valencia (2010) and related Web site	Binary variable, equal to one if the country of the target headquarters is undergoing a banking crisis in the year of loan initiation
Target country GDP per capita	World Bank	GDP per capita for the country in which the target's headquarters are located, in 2000 U.S. dollars (adjusted using the CPI)
Target country GDP growth	World Bank	Year-to-year change in GDP per capita for the country in which the target's headquarters are located, in 2000 U.S. dollars (adjusted using the CPI)
Target country market cap to GDP	World Bank	The sum of share price times the number of shares outstanding of all listed domestic companies (excluding investment companies, mutual funds, or other collective investment vehicles) divided by the total GDP, for the country in which the target's headquarters are located
Total assets (TA)	Worldscope, WC02999	Total assets, adjusted to the base year 2000 by using the CPI
Return on assets (ROA)	Worldscope, WC08326	The exact definition varies by industry; please refer to the Worldscope Database Datatype Definitions Guide, available at www.thomson.com/financial
Quick ratio (QR)	Worldscope, WC08101	Cash and equivalents plus net receivables, divided by total current liabilities
Closely held shares (CHS)	Worldscope, WC08021	The number of closely held shares divided by common shares outstanding. "Closely held shares" represents shares held by insiders, other corporations, pension and benefit plans, and any individual holdings more than 5% of shares outstanding
Sales growth (SG)	Worldscope, WC08698	Net sales or "Revenue" divided by the previous year's "Net sales" or "Revenue"
Debt to assets (DtoA)	Worldscope, WC08236	"Total debt" divided by "Total assets"
Market to book (MtoB)	Worldscope, WC09704	Market capitalization of the firm divided by common equity
Foreign	SIL SWF Database/SDC	Binary variable, set equal to one if the acquirer country and target country of headquarters are not the same
SWF	SIL SWF Database	Binary variable, set equal to one if the acquirer is a SWF (or a majority-owned SWF subsidiary)
SWF Norway	SIL SWF Database	Binary variable, set equal to one if the acquiring SWF is (not) the Norwegian Government Pension Fund Global
SWF political dummy	SIL SWF Database; Truman (2008)	Binary variable, set equal to one if decisions on specific investments are made by managers, based on Truman (2008)
SWF political index	SIL SWF Database; Truman (2008)	Degree of political interference in the management of a SWF, based on questions 9, 10, and 11 in Truman (2008). Higher values indicate higher levels of political interference
First investment	SIL SWF Database	Binary variable, set equal to one if "Stake acquired" is equal to "Stake owned"
Capital injection	SIL SWF Database	Binary variable, set equal to one if the investment is a capital raising event for the target
Director	SIL SWF Database, SWF and target annual reports	Binary variable, set equal to one if the investor appoints at least one director to the board of directors
Return	Datastream, RI	Daily percentage change in the total return index (RI), in U.S. dollars.
Local-index return	Datastream, LI	Daily percentage change in the total return index for the local market index identified by Datastream (LI), in U.S. dollars.

This table includes the source and brief definition of each variable used in the analysis. Definitions of Worldscope variables are included in the Worldscope Database Datatype Definitions Guide (www.thomson.com/financial).

Table A2
Probability of SWF as an acquirer determined from probit models

Variable	Model 1	Model 2
Intercept	−7.5492***	−7.8694***
	(58.8933)	(49.4011)
Foreign	−1.557***	−1.3965***
	(144.846)	(83.1869)
Total assets (log)	0.393***	0.3856***
	(127.1267)	(99.1662)
Return on assets	0.0047	0.0204***
	(0.5722)	(6.6507)
Debt to assets	−0.0015	−0.0033
	(0.1598)	(0.6352)
Market to book	0.0257	0.0139
	(1.7386)	(0.4464)
Closely held shares	0.0001	−0.0001
	(0.0522)	(0.0876)
Buy and hold abnormal return, market adjusted, previous year	0.2286***	0.2126**
	(9.6571)	(6.0246)
Target country GDP per capita (log)	−0.0156	−0.0120
	(0.0469)	(0.0199)
Target country GDP growth	0.0290	0.0388
	(1.0593)	(1.3782)
Market capitalization to GDP	−0.0011	−0.0007
	(0.7267)	(0.1701)
Target country common	0.7603***	0.8504***
	(19.3717)	(15.405)
Target country democracy	−0.0186	−0.031**
	(2.0509)	(4.0016)
Crisis	1.2471***	1.4628***
	(64.971)	(57.2322)
Capital injection		0.4685**
		(4.7678)
Control		1.1155**
		(5.0576)
Stake		−0.0248***
		(9.777)
First investment		0.5041***
		(19.1403)
Observations	3,807	2,886
Percent concordant	97.6%	98.4%
Percent discordant	2.2%	1.5%

This table includes coefficient estimates from probit models. The response is a binary variable assuming the value of one if the investor is a SWF or a SWF-majority-owned subsidiary and zero otherwise. All predictors are as defined in Table A1. Industry and year controls are included, but related coefficient estimates are omitted. Standard errors are clustered at the investment target level; Wald's chi-square test statistics are reported in parentheses below the related coefficient estimates. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 level.

References

Admati, A. R., and P. Pfleiderer. 2009. The "Wall Street walk" and shareholder activism: Exit as a form of voice. *Review of Financial Studies* 22:2645–85.

Ang, A., W. Goetzmann, and S. Schaefer. 2009. Evaluation of active management of the Norwegian government pension fund-global. Report to the Norwegian Parliament.

Avendaño, R. 2012. SWF investments: Firm-level preferences to natural endowments. Working Paper, Paris School of Economics.

Avendaño, R., and J. Santiso. 2011. Are sovereign wealth funds politically biased? A comparison with other institutional investors. Eds. N. Boubakri and J.-C. Cosset. In *Institutional investors in global capital markets*, Vol. 12, 313–53. Bingley, UK: Emerald Group Publishing Limited.

Ayyagari, M., A. Demirgüç-Kunt, and V. Maksimovic. 2006. How well do institutional theories explain firms' perceptions of property rights? *Review of Financial Studies* 21:1833–71.

Bagnall, A. E., and E. M. Truman. 2011. IFSWF report on compliance with the Santiago principles: Admirable but flawed transparency. Peterson Institute for International Economics Policy Brief.

Bortolotti, B., ed. 2014. *The great reallocation - sovereign wealth fund annual report 2013*. Milan, Italy: Sovereign Investment Lab, Università Bocconi.

Brav, A., W. Jiang, F. Partnoy, and R. S. Thomas. 2008. Hedge fund activism, corporate governance, and firm performance. *Journal of Finance* 63:1729–75.

Brown, S. J., and J. B. Warner. 1985. Using daily stock returns: The case of event studies. *Journal of Financial Economics* 8:208–58.

Cai, J., J. L. Garner, and R. A. Walking. 2009. Electing directors. *Journal of Finance* 64:2389–421.

Caliendo, M., and S. Kopeinig. 2008. Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys* 22:31–72.

Campello, M., J. R. Graham, and C. R. Harvey. 2010. The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics* 97:470–87.

Caner, M., and T. Grennes. 2009. Sovereign wealth funds: The Norwegian experience. Working Paper, North Carolina State University.

Chambers, D., E. Dimson, and A. Ilmanen. 2012. The Norway model. *Journal of Portfolio Management* 38:67–81.

Chen, X., J. Harford, and K. Li. 2007. Monitoring: Which institutions matter? *Journal of Financial Economics* 86:279–305.

Del Guercio, D., L. Seery, and T.Woitdke. 2008. Do boards pay attention when institutional investor activists "just vote no"? *Journal of Financial Economics* 90:84–103.

Dewenter, K. L., X. Han, and P. H. Malatesta. 2010. Firm value and sovereign wealth fund investments. *Journal of Financial Economics* 98:256–78.

Dyck, A. I. J., and A. Morse. 2011. Sovereign wealth fund portfolios. Working Paper, Chicago Booth School of Business.

Edmans, A. 2009. Blockholder trading, market efficiency and managerial myopia. *Journal of Finance* 64:2481–513.

Estrin, S., J. Hanousek, E. Kocenda, and J. Svejnar. 2009. The effects of privatization and ownership in transition economies. *Journal of Economic Literature* 47:699–728.

Fernandes, N. G. 2014. The impact of sovereign wealth funds on corporate value and performance. *Journal of Applied Corporate Finance* 26:76–84.

Ferreira, M. A., and P. Matos. 2008. The color of investors' money: The role of institutional investors around the world. *Journal of Financial Economics* 88:499–533.

Ferreira, M. A., M. Massa, and P. Matos. 2010. Shareholders at the gate? Institutional investors and the cross-border mergers and acquisitions. *Review of Financial Studies* 23:601–44.

Griffin, J., and J. Xu. 2009. How smart are the smart guys? A unique view from hedge fund stock holdings. *Review of Financial Studies* 22:2351–570.

Greenwood, R., and M. Schoar. 2009. Investor activism and takeovers. *Journal of Financial Economics* 92:362–75.

Hall, P. 1992. On the Removal of skewness by transformation. *Journal of the Royal Statistical Society, Series B (Methodological)* 54:221–8.

Hertzel, M., M. Lemmon, J. S. Linck, and L. Rees. 2002. Long-run performance following private placements of equity. *Journal of Finance* 57:2595–617.

Hertzel, M., and R. L. Smith. 1992. Market discounts and shareholder gains for placing equity privately. *Journal of Finance* 48:459–85.

Holthausen, R. W., R. W. Leftwich, and D. Mayers. 1987. The effect of large block transactions on security prices. A cross-sectional analysis. *Journal of Financial Economics* 19:237–67.

———. 1990. Large-block transactions, the speed of response, and temporary and permanent stock-price effects. *Journal of Financial Economics* 26:71–95.

Karolyi, G. A., and R. C. Liao. 2014. State capitalism's global reach: Evidence from foreign acquisitions by state-owned companies. Working Paper, Cornell University and Rutgers Business School.

Klein, A. M., and E. Zur. 2009. Entrepreneurial shareholder activism: Hedge funds and other private investors. *Journal of Finance* 64:182–229.

Knill, A. M., B. S. Lee, and N. Mauck. 2012. Sovereign wealth fund investment and the return-to-risk relationship of target firms. *Journal of Financial Intermediation* 21:315–40.

Kotter, J., and U. Lel. 2011. Friends or foes? Target selection decisions of sovereign wealth funds and their consequences. *Journal of Financial Economics* 101:360–81.

La Porta, R., F. López-de-Silanes, A. Shleifer, and R. W. Vishny. 1998. Law and finance. *Journal of Political Economy* 106:1113–50.

Laeven, L., and F. Valencia. 2010. Resolution of banking crises: The good, the bad, and the ugly. Working Paper, International Monetary Fund.

———. 2012. Systemic banking crises database: An update. Working Paper, International Monetary Fund.

Lyon, J., B. M. Barber, and C. L. Tsai. 1999. Improved methods for tests of long-run abnormal stock returns. *Journal of Finance* 54:165–201.

Megginson, W. L., and J. M. Netter. 2001. From state to market: A survey of empirical studies on privatization. *Journal of Economic Literature* 39:321–89.

Megginson, W. L., and V. Fotak. 2014. Rise of the fiduciary state: A survey of sovereign wealth fund research. Working Paper, University of Oklahoma and University at Buffalo.

Mehrpouya, A., C. Huang, and T. Barnett. 2009. An analysis of proxy voting and engagement policies and practices of the sovereign wealth funds. Inverstor Responsibility Research Center Institute SWF Report.

Mikkelson, W. H., and R. S. Ruback. 1985. An empirical analysis of the interfirm equity investment process. *Journal of Financial Economics* 14:523–53.

Miracky, W. F., and B. Bortolotti, eds. 2009. Weathering the storm: Sovereign wealth funds in the global economic crisis of 2008. Boston, MA: Monitor Group and Milan, Italy: Fondazione Eni Enrico Mattei.

Parrino, R., R.W. Sias, and L. T. Starks. 2003. Voting with their feet: Institutional ownership changes around forced CEO turnover. *Journal of Financial Economics* 68:3–46.

Roberts, M. R., and T. M. Whited. 2012. Endogeneity in empirical corporate finance. Working Paper, Simon School.

Rodrik, D., and R. Wacziarg. 2005. Do democratic transitions produce bad economic outcomes? *American Economic Review* 95:50–55.

Rose, P. 2008. Sovereign wealth funds: Active or passive investors? *Yale Law Journal Pocket Part* 118:104–8.

Shleifer, A., and R. W. Vishny. 1986. Large shareholders and corporate control. *Journal of Political Economy* 94:461–88.

———. 1994. Politicians and firms. *Quarterly Journal of Economics* 109:995–1025.

Truman, E. M. 2008. A Blueprint for sovereign wealth fund best practices. Policy Brief, Peterson Institute for International Economics.

———. 2011. Are Asian sovereign wealth funds different? *Asian Economic Policy Review* 6:249–68.

Wruck, K. H., and Y. L. Wu. 2009. Relationships, corporate governance, and performance: Evidence from private placements of common stock. *Journal of Corporate Finance* 15:30–47.