How Much Does Investor Sentiment Really Matter for Equity Issuance Activity?

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Abstract

We study the extent to which investor sentiment matters for aggregate equity issuance activity. We focus on firms that are susceptible to investor sentiment and for which accurate measures of economic fundamentals are available. While sentiment on its own matters for equity issuance, it matters relatively little once we control for accurately measured fundamentals. Collectively, proxies for sentiment explain roughly 10 percentage points of the time-series variation of equity issuance beyond the roughly 40% explained by fundamentals. We conclude that investor sentiment does not seem to matter very much for aggregate equity issuance activity.

Keywords: *IPOs*; *capital demands*; *economic fundamentals*; *investor sentiment*

JEL classification: *G*32

1. Introduction

'Investor sentiment . . . is a belief about future cash flows and investment risks that is not justified by the facts at hand' (Baker and Wurgler, 2007). The conviction that

investor sentiment affects investors' and managers' involvement in the stock market has been growing steadily in recent years. Assuming first that there exist investors who do not always price stocks at their fundamental value and second that arbitrage to correct mispricing is risky, behavioural finance argues that investor sentiment can result in periodic mispricing relative to fundamentals. One important implication of this argument is that managers may be able to exploit such mispricing by issuing equity when their firm's stock price is high due to investor optimism (Baker and Wurgler, 2002). Moreover, managers as a group may issue relatively more equity than debt at market peaks, thus exploiting not only own-firm mispricing but also market-wide mispricing (Baker and Wurgler, 2000).

The perceived link between favourable investor sentiment and greater equity issuance activity is so strong that it is increasingly common for researchers to use aggregate equity issuance activity as a proxy for investor sentiment. For instance, Baker and Wurgler (2006) study how the cross-section of stock returns depends on investor sentiment, as proxied by two measures of aggregate equity issuance activity among other variables, and they find evidence of a significant relationship. Dittmar and Dittmar (2006) study how aggregate repurchase activity is explained by market timing measures, such as equity issuance activity, and business cycle fluctuations, and they conclude that the evidence supports the business cycles explanation. Of course, equity issuance activity is a good proxy for investor sentiment only if sentiment is a major driver of equity issuance. The big outstanding question is: How much does investor sentiment really matter? This is the question we ask in this paper. More precisely, we wish to quantify the extent to which equity issuance activity at a point in time is explained by investor sentiment above and beyond prevailing economic fundamentals.

Researchers have investigated sentiment and fundamentals as drivers of equity issuance, focusing typically on the number of IPOs ('IPO volume'). This is a sensible choice. As Baker and Wurgler (2007) put it, '[t]he stocks most sensitive to investor sentiment will be those of companies that are younger, smaller, more volatile, unprofitable, non-dividend paying, distressed or with extreme growth potential, or having analogous characteristics'. Brav and Gompers (1997) similarly argue that '[i]f any type of firm is likely to be subject to fads and investor sentiment, it is these firms. Their equity is held primarily by individuals'. When it comes to finding firms susceptible to investor sentiment, firms going public clearly fit the bill.

However, the literature does not help us draw definitive conclusions about the extent to which investor sentiment really matters. Some authors have found support only for sentiment (for instance, see Loughran *et al*. (1994) and Helwege and Liang (2004)). Others have found balanced support for both fundamentals and sentiment (for instance, see Lowry (2003)). The main stumbling block of the existing literature is that it is pretty difficult to find compelling measures of fundamentals and proxies for sentiment. How much sentiment matters relative to fundamentals is hard to assess when we are not even sure that we are measuring fundamentals correctly. (For instance, do aggregate sales growth and the closed-end fund discount really allow for a sufficiently powerful test to distinguish between fundamentals and sentiment, respectively?)

In this paper, we revisit the relative importance of fundamentals and sentiment in explaining equity issuance activity by focusing on a setting in which fundamentals can be measured accurately and in which sentiment should feature prominently. We choose the petroleum industry for the following reasons. It is pretty clear that measures such as oil production and the number of wells drilled measure fundamentals in the petroleum industry accurately. Also, such measures should shed a brighter light on equity issuance

in the petroleum industry than does economy-wide sales growth, for instance, on equity issuance in all industries, which include industries as disparate as technology services and clothing manufacturing. Finally, the petroleum industry provides fertile ground for sentiment to thrive. Ritter (1991) finds that the petroleum industry had the worst underperformance during his 1975–84 sample period, which some researchers argue can be interpreted as *ex post* evidence of sentiment-driven overvaluation. He points out that most of his petroleum firms went public in 1980 or 1981, a hot issues market for the natural resources industry (Ritter, 1984).

We focus on Canada for the following reasons. The Canadian petroleum industry is important, both internationally and relative to the Canadian economy.[1] Also, the Canadian equity markets are among the most developed in the world, and Canadian capital markets are particularly popular with issuers in the petroleum industry. Over 600 firms in the Canadian petroleum industry go public during the sixteen-year period we examine. By comparison, only 107 firms in the US petroleum industry go public over the same period. Finally, IPO firms in the Canadian petroleum industry stand to be substantially influenced by sentiment. These firms raise just $1.6 million (Canadian dollars) on average in our sample whereas US IPO firms raise $39.0 million (US dollars) on average. If sentiment should matter anywhere, it should matter for tiny firms going public. Moreover, our sample firms are much less liquid than US IPO firms. Consequently, it is likely to be difficult to implement trading strategies to arbitrage away any mispricing that arises.[2] Overall, therefore, our sample firms seem to be more likely to be subject to investor sentiment than the US firms used in existing studies examining the impact of fundamentals and investor sentiment on equity issuance activity.

Armed with our accurate measures of fundamentals, we run a horse race between fundamentals and sentiment. To ensure that the horse race is fair to sentiment, we need to use proxies for sentiment that are competitive with our measures of fundamentals. First, we use several proxies for sentiment used in the existing literature. Next, we use scaled price and liquidity variables for the petroleum industry, such as the dividend yield and trading volume. If sentiment affects stock prices, it should affect these variables. Moreover, to the extent that sentiment has an industry-specific component (an issue about which we are agnostic), these market-based proxies for sentiment should capture the component of sentiment specific to the petroleum industry. In our tests, the component of these market-based variables not explained by fundamentals we attribute to sentiment (see Baker and Wurgler, 2007).

Our main results can be summarised as follows. We begin our investigation by replicating tests from the literature using our sample. Consistent with the literature, we find that both fundamentals and sentiment explain IPO volume, albeit modestly. When we use our industry-specific measures of fundamentals in place of the traditional measures (such as GDP growth), fundamentals explain much of IPO volume and sentiment matters relatively little. Either sentiment does not matter or the traditional proxies for sentiment are not up to snuff.

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[1] In 2004, Canada produced about 4% of the world's oil output, about one-third of the top producer, Saudi Arabia (Central Intelligence Agency, 2005), and energy is Canada's second-largest industry, accounting for about 8% of GDP in 1998 (Sadorsky, 2001).

[2] Investors will bear the costs of becoming informed about arbitrage opportunities if arbitrage profits are sufficiently large. However, even if information costs are low, low liquidity (high trading costs, low market depth, etc.) may make it unprofitable to arbitrage away even large deviations of price from fundamentals.

To test the second alternative, we retain our industry-specific measures of fundamentals and improve upon the traditional proxies for sentiment. On their own, our improved proxies for sentiment do have some explanatory power for IPO volume, typically more than the traditional proxies. However, when we include them alongside our industry-specific measures of fundamentals, sentiment once again matters relatively little. Collectively, our improved proxies for sentiment contribute roughly 10 percentage points of explanatory power compared with the roughly 40% of IPO volume explained by our industry-specific measures of fundamentals. To recap, the empirical evidence in the literature suggests that the dominant force behind equity issuance activity is investor sentiment. Economic fundamentals at best matter as much as sentiment, but possibly less, particularly for IPO volume. Our results suggest that it is in fact sentiment that matters relatively little when fundamentals are measured more accurately.

Finally, to check our results, we exploit a unique feature of our sample. About half of our sample firms are particularly small, young, and risky firms that sell equity exclusively to individual investors. As such, this sub-sample of firms should be acutely susceptible to investor sentiment, so we repeat our foregoing tests for this sub-sample of firms. As it turns out, our results are largely unchanged using this sub-sample of firms as compared to the whole sample. We conclude that, both on its own and relative to economic fundamentals, investor sentiment has a fairly limited role in explaining equity issuance activity. Since equity issuance activity is far from a clear-cut proxy for investor sentiment, we suggest that researchers be cautious about using measures of aggregate equity issuance activity to uncover evidence of market irrationality. This is especially true if investors are overoptimistic or overpessimistic when fundamentals are actually very good or bad, respectively.

The rest of the paper is organised as follows. Section 2 presents the data. Section 3 presents the results. Section 4 concludes.

2. Sample Selection and Data Description

2.1. *Rationale for choice of sample*

Within the universe of firms that go public, we choose to investigate the Canadian petroleum industry for strategic reasons. First and foremost, for our tests to succeed, we need accurate measures of fundamentals. Hence we need firms operating in an environment where accurate measures of economic activity are available to the researcher. Firms engaged in the exploration and development of natural resources fit the bill. In this now considerably narrowed field, we need to have a large number of IPOs over several business cycles. This brings us to the Canadian petroleum industry.

Within this industry, there are countless junior firms whose primary activity is exploration and development (Bott, 1999). The typical firm secures some financing based on an exploration plan, spends several years and most of its funds on prospecting for economically feasible petroleum deposits, all the while generating no revenues. Whatever cash flows the firm may ultimately generate are off many years into the future and hinge entirely on whether the firm strikes it rich (most do not). Debt financing, with its regular fixed interest payments, is generally not a viable financing option so equity financing is typically used.[3]

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[3] In unreported results, we examine annual venture capital data from the Canadian Venture Capital Association broken out for energy firms. Neither the number of investments each

A large number of such firms tap the public equity markets. Our sample consists of 631 firms in the Canadian petroleum industry that go public between 1986 and 2001. By comparison, only 107 firms in the petroleum industry go public in the U.S. over the same period. Moreover, Canadian petroleum firms that go public are much more homogeneous than their US counterparts, the former being virtually all junior petroleum firms. At any rate, Canada's equity markets are among the most developed in the world, and petroleum has consistently been one of Canada's biggest industries over many decades.

We include two types of firms that go public in our study, namely, regular firms and capital pools. Of our 631 sample firms, 289 are regular firms and 342 are capital pools. A capital pool is simply a shell company. Insiders put up some of their own money and sell shares to outside investors on the basis of their plan to acquire sufficient operating assets, usually in a pre-determined industry, to allow the capital pool to transition to a regular stock exchange list, usually within a year of formation. All but ten of our sample petroleum capital pools complete their transition. Since a capital pool can only raise a few hundred thousand dollars, outside investors in capital pools are individual investors. Still, capital pools are widely held because there have to be at least 300 shareholders, and each individual can typically each purchase no more than 1% to 2% of the public distribution.

The stock exchange regulates the capital pool programme and enforces its regulations with the aim of preventing theft of money raised and manipulative trading.[4] We include capital pools in our sample alongside regular IPOs because the two types of firms are similar in function. At the same time, we exploit the fact that since capital pools start off without any operations, they are highly speculative investments and thus should be sensitive to investor sentiment, even more so than the typical small regular firm in the Canadian petroleum industry that goes public.[5] In spite of the great potential for abuse in capital pools, the academic and anecdotal evidence both indicate that abuses were practically non-existent (for instance, see Haggett (1996) and Robinson (1997)).

2.2. *Sample selection*

We construct our sample from Canadian petroleum firms that go public on any of the Alberta, Montréal, Toronto, and Vancouver Stock Exchanges and their successor

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year nor the amount invested, either in total or per firm, is correlated with IPO volume during our sample period, so for petroleum firms venture capital does not appear to be substituting for or complementing the public equity markets.

[4] For an in-depth description of the early years of the junior capital pool programme, see Robinson (1997). Also see Lerner (1994) for the timing of the IPOs of venture capital-backed biotechnology firms.

[5] The capital pool programme is tailored with individual investors in mind. Suppose that capital pool insiders raise the maximum financing allowed from outsiders during our sample period, $500,000, and that each investor can purchase as much as 2% of the public distribution. This means that the largest investor can own at most $10,000 worth of the capital pool, an amount too small to allow investment by institutional investors. The requirement of having at least 300 shareholders means that the average shareholder owns $1,667 worth of the capital pool, a very small amount. For general support for our claim that capital pools raise financing exclusively from individual investors (and from management), see Robinson (1997) and Carpentier and Suret (2006).

exchanges. By the petroleum industry, we mean firms engaged in oil and gas extraction (SIC 131X and 132X), field equipment and services (SIC 138X and 3533), refining (SIC 291X), and distribution (492X). We construct our sample separately for the periods 1986–93 and 1994–2001. For the earlier period, we use the monthly and annual stock exchange *Review*s to create a list of all firms that go public and their list dates. When possible, we use these sources to identify petroleum firms, otherwise we use the first annual *Financial Post Survey* available after the listing date to identify petroleum firms. For the later period, we use *Securities Data Company* to create a list of petroleum firms that go public and their list dates (SDC's coverage, particularly of capital pools, is very patchy in the earlier period). We end our sample in 2001 because after the Canadian Venture Exchange became the TSX Venture Exchange in 2002 listing requirements were substantially tightened and the stock market landscape changed. The petroleum industry had been gradually moving towards fewer but larger (and more capital-intensive) projects since the mid-1990s, favouring exploitation of the oil sands over conventional oil and gas well. Firms going public became fewer and larger, rendering comparison with the pre-2002 period difficult.

We exclude firms cross-listed from other Canadian or foreign exchanges, firms re-listed after previously being delisted, spinoffs from publicly traded parent firms, government privatisations, amalgamations of firms in which at least one firm was hitherto publicly traded, reverse takeovers of moribund publicly traded firms by private firms, and investment funds and trusts and limited partnerships. To this end, we use stock exchange *Review*s, custom data from Financial Post, *Financial Post Surveys*, *Securities Data Company* and press releases from *Factiva*. For every capital pool, we determine when (if ever) it completed its transition to a regular list using *Financial Post Surveys* and stock exchange *Reviews*.

We use the *Financial Post Record of New Issues*, *Securities Data Company*, and prospectuses to collect data on financing proceeds. We use custom data from *Financial Post* and stock exchange *Reviews* to collect data on share prices and the number of shares outstanding. For each firm, we consult all of our sources and use the earliest available share price and shares outstanding.

Between 1986 and 2001, 658 firms go public. Of these, 27 are substantially larger than the rest (these large firms all have market capitalisations greater than $100 million and raise more than $25 million in financing proceeds), so we eliminate them. This exclusion leaves the time series of the number of IPOs basically unchanged but it prevents the time series of total IPO proceeds from being dominated entirely by this handful of comparatively huge firms.[6] At the same time, this exclusion de-emphasises large firms for which fundamentals should drive equity issuance rather than sentiment, at least compared to small firms, and thus should favour sentiment. Our final sample consists of 631 firms, of which 289 (46%) are regular firms and 342 (54%) are capital pools.

2.3. *Descriptive statistics*

The unit of analysis throughout this paper is the calendar quarter. We sum the number of IPOs each quarter as well as their total proceeds to obtain the time series variables that

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[6] If we include these large firms, our results are unchanged except for our results for total IPO proceeds (for regular firms and capital pools together), which are no longer statistically significant.

we explain in this paper. We perform all of our analyses for all firms (regular firms and capital pools), to which we often refer as 'IPO firms' for simplicity, as well as for capital pools only. We define and provide the sources of our times series variables in Table 1. These variables include our measures of economic fundamentals and our proxies for investor sentiment. We generally leave time series variables as they are unless they are non-stationary, in which case we scale them if possible or detrend them otherwise. To detrend variables, we assume that $y_t = \alpha + \beta \cdot t + \varepsilon_t$, where t is a quarterly time trend, we estimate β using an ordinary least squares regression, and we use $y_t - \hat{\beta} \cdot t$ as our detrended variable. We deseasonalise time series variables that exhibit seasonalities. To deseasonalise variables, we assume that y_t can be represented as the product of a long-term component, a seasonal component, and a random error component. We first remove the long-term component of y_t by computing a four quarter moving average of y_t as $z_t = y_t/\tilde{y}_t$, where $\tilde{y}_t = (1/4) \cdot (y_{t-2} + y_{t-1} + y_t + y_{t+1})$. We then remove the random error component by computing the average of z_t for each of four quarters, $\bar{z}^q$, $q = 1, 2, 3, 4$. We adjust $\bar{z}^q = \tilde{z}^q/(\tilde{z}^1 + \tilde{z}^2 + \tilde{z}^3 + \tilde{z}^4)$ to ensure that the quarterly seasonal components sum to one. Finally, we compute deseasonalised y_t by dividing y_t by the $\bar{z}^q$ of the corresponding quarter.

Table 2 presents descriptive statistics on our firm level and industry level variables. Very briefly, the typical regular firm raises little money in absolute terms, roughly a mean (median) of $3.2 million ($1.2 million). Because capital pools are prevented by regulation from raising more than a few hundred thousand dollars, they only raise roughly a mean (median) of $260,000 ($240,000). As we would expect, our sample firms have small market capitalisations in absolute terms, roughly a mean (median) of $11.1 ($4.6) million for regular firms and just $1.4 ($1.2) million for capital pools. A mean (median) of 9.9 (8.0) firms go public every quarter, about half of which (mean (median) 4.5 (4.0)) are regular firms and the rest (mean (median) 5.3 (4.0)) are capital pools.

Figure 1 provides an overview of the number of IPOs (Figure 1-A) and their total proceeds (Figure 1-B) over our sample period. The number of IPOs fluctuates pretty closely with their total proceeds (they have a correlation coefficient of 0.724 (p-value 0.000)). We note that total IPO proceeds are dominated by the proceeds of regular firms since capital pools' proceeds are kept very low by regulation. Although we always report results for both IPO volume and total IPO proceeds, the focus of our analysis is IPO volume. The focus of the existing research has almost entirely been on IPO volume and this time series in particular has been claimed to be a proxy for investor sentiment.

Figure 1 also compares the number of IPOs and their total proceeds to a representative measure of economic fundamentals and a representative proxy for investor sentiment, oil production and the dividend yield of the TSE Oil & Gas Index, respectively. Both fundamentals and sentiment align consistently with peaks and troughs in equity issuance activity although it remains to be seen how well each explains equity issuance when fundamentals and sentiment are used simultaneously.

3. Results

We begin our analysis by benchmarking our results against the received wisdom in the literature. We therefore replicate Lowry (2003)'s key results on fundamentals and sentiment in her Table 3. We refer to her variables as 'traditional' variables for simplicity. Her measures of fundamentals (such as GDP growth) have been used extensively in the literature on equity issuance (for instance, by Loughran *et al.* (1994)). Additionally,

Table 1

Variable definitions and data sources

Variable	Definition and source
Measures of equity issuance activity	
ln(1 + number of IPOs)	Natural logarithm of one plus the number of IPOs (by both regular firms and capital pools) in the Canadian petroleum industry each quarter. Source: Alberta, Montréal, Toronto, and Vancouver Stock Exchange *Review*s, *Financial Post Survey*, *Securities Data Company*, custom data from Financial Post, and *Factiva*.
ln(1 + proceeds)	Natural logarithm of one plus the total proceeds of IPOs (of both regular firms and capital pools) in the Canadian petroleum industry each quarter. In millions of December 2004 Canadian dollars. Source: *Financial Post Record of New Issues* and *Securities Data Company.*
Measures of economic fundamentals	
ln(oil production)	Detrended natural logarithm of mean daily Canadian oil production each quarter. In millions of cubic meters. Source: National Energy Board.
ln(number of rigs operating)	Detrended natural logarithm of mean deseasonalised number of rigs operating in Canada each quarter. In thousands of rigs. Source: Baker Hughes Incorporated.
Petroleum return on equity	Net profit this quarter divided by book value of equity last quarter for the Canadian oil and gas industry each quarter. Source: Statistics Canada.
ln(petroleum dollar investment)	Detrended natural logarithm of Canadian petroleum industry real expenditures on exploration and development each quarter (we use the same data for all four quarters of a given year). In millions of December 2004 Canadian dollars. Source: Canadian Association of Petroleum Producers.
ln(number of wells drilled)	Detrended natural logarithm of deseasonalised mean number of oil and gas wells drilled in Canada each quarter. In thousands of wells. Source: Canadian Association of Oilwell Drilling Contractors.
ln(petroleum land sold)	Detrended natural logarithm of land sold in Canada for petroleum exploration and development each quarter. In billions of hectares. Source: Nickle's.
Proxies for investor sentiment	
BW SENTIMENT	The first principal component of the correlation matrix consisting of the value weighted closed-end fund discount, NYSE turnover, the number of U.S. IPOs in all industries, the mean initial return on U.S. IPOs in all industries, the equity share in new issues, and the dividend premium. Source: Jeffrey Wurgler (http://pages.stern.nyu.edu/~jwurgler).
Michigan Consumer Sentiment Index	Source: http://www.sca.isr.umich.edu
TSE Oil & Gas Index D/P, TSE Oil & Gas Index level, and *ln(TSE Oil & Gas Index trading volume)*	The variables all pertain to the TSE Oil & Gas Index and include the ratio of total dividends to market value, the real level of the index including distributions (scaled to equal 1 at the end of December 1985), both at the end of each quarter, and the natural logarithm of total trading volume during each quarter. Trading volume is in millions of shares. Source: Toronto Stock Exchange *Review*s.

Table 2

Descriptive statistics

This table presents descriptive statistics at both the firm level and industry level. The sample comprises 631 firms in the Canadian petroleum industry between 1986 and 2001 of which 289 are offerings by regular firms and 342 are offerings by capital pools. Panel A presents cross-sectional descriptive statistics for our sample firms. Panel B presents calendar quarter time series descriptive statistics at the industry level. Variables are defined in Table 1. Market capitalisation is measured in millions of December 2004 Canadian dollars. In this table only, *oil production*, *number of rigs operating*, *petroleum investment*, *number of wells drilled*, and *petroleum land sold* are reported before detrending, and *petroleum return on equity* is reported as a percent.

Panel A: Cross-sectional (firm level) data

	Mean	St. dev.	Q1	Median	Q3
Proceeds ($ million)					
All firms	1.62	3.26	0.23	0.35	0.98
Regular IPO firms only	3.23	4.30	0.39	1.22	4.91
Capital pools only	0.26	0.11	0.21	0.24	0.35
Market capitalisation ($ million)					
All firms	5.86	11.93	1.02	1.70	4.27
Regular IPO firms only	11.14	16.07	1.92	4.58	11.28
Capital pools only	1.40	0.95	0.76	1.18	1.74

Panel B: Time series (industry level) data

	Mean	St. dev.	Q1	Median	Q3
Number of IPOs					
All firms	9.9	7.8	4.0	8.0	13.5
Regular firms only	4.5	4.1	2.0	4.0	6.5
Capital pools only	5.3	5.0	1.0	4.0	7.5
Proceeds ($ million)					
All firms	16.0	17.7	3.1	9.7	21.8
Regular firms only	14.6	17.0	1.6	8.2	20.4
Capital pools only	1.4	1.3	0.2	1.1	2.3
Measures of economic fundamentals					
Oil production (millions of m^3 per day)	1.9	0.2	1.7	1.9	2.1
Number of rigs operating	222.2	94.9	141.6	214.3	289.8
Petroleum return on equity (%)	1.4	1.9	0.3	1.7	2.5
Petroleum investment ($ billion)	8.3	3.8	4.6	8.1	11.0
Number of wells drilled	2,498.0	1,155.6	1,473.5	2,362.3	3,225.7
Petroleum land sold (millions of hectares)	1.1	0.4	0.8	1.0	1.3
Proxies for investor sentiment					
BW SENTIMENT	0.29	0.54	−0.02	0.14	0.65
Michigan Consumer Sentiment Index	92.5	10.0	87.9	92.3	98.3
TSE Oil & Gas Index D/P (%)	1.3	0.6	0.8	1.0	1.8
TSE Oil & Gas Index level	1.23	0.28	1.06	1.19	1.44
ln (TSE Oil & Gas Index trading volume) (millions of shares)	402.5	334.1	123.9	300.6	670.1

A

IPO volume (left axis)   ln(oil production) (right axis)   TSE Oil & Gas Index level (right axis)

B

IPO proceeds (left axis)   ln(oil production) (right axis)   TSE Oil & Gas Index level (right axis)
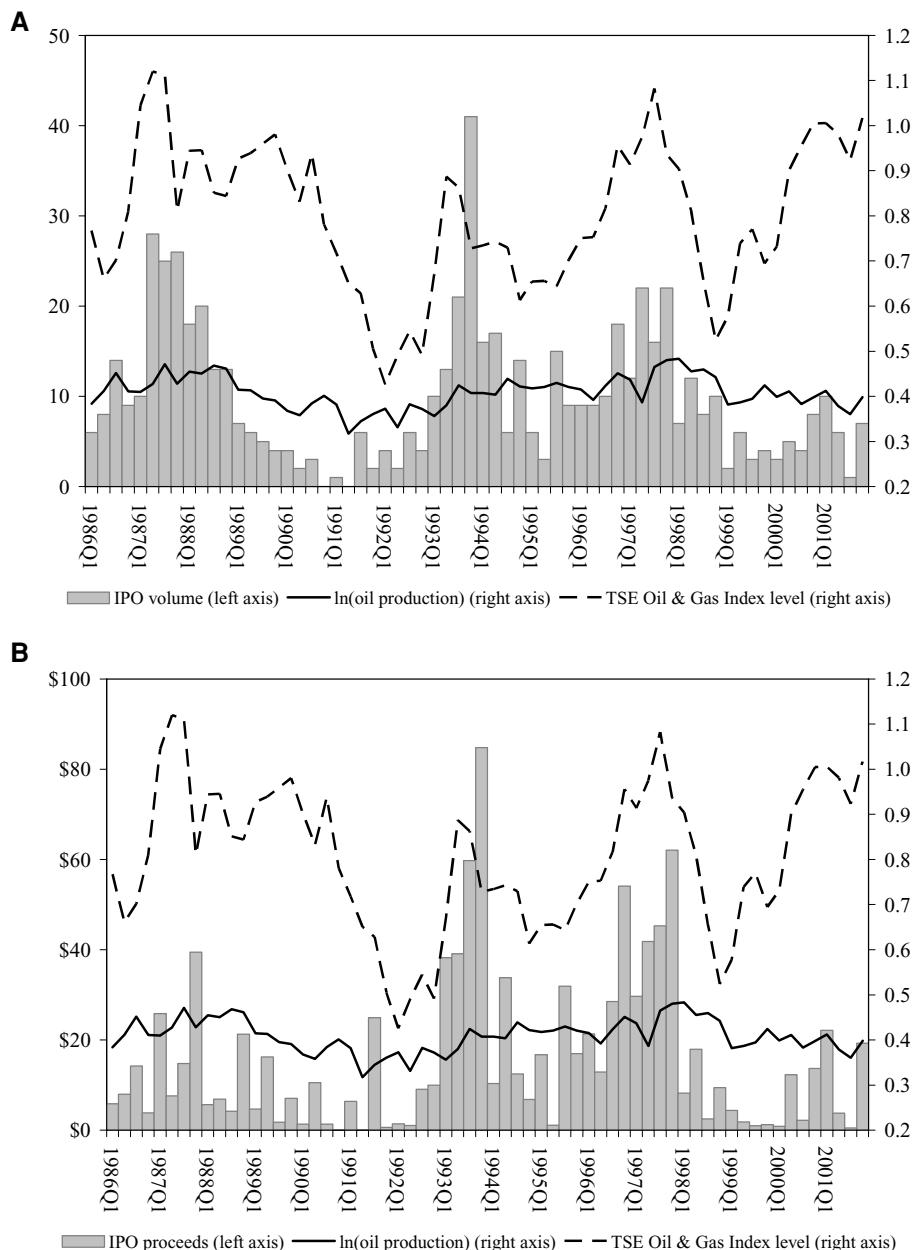
Fig. 1. Equity issuance activity, economic fundamentals, and investor sentiment.

These figures present the number of IPOs and total IPO proceeds (measures of equity issuance activity), oil production (a measure of economic fundamentals), and the level of the TSE Oil & Gas Index (a proxy for investor sentiment) each quarter. The sample comprises 631 firms in the Canadian petroleum industry between 1986 and 2001 of which 289 are offerings by regular firms and 342 are offerings by capital pools.

Table 3

Impact of fundamentals and sentiment on equity issuance activity using traditional measures of fundamentals and traditional proxies for sentiment

This table presents calendar quarter regressions of measures of equity issuance activity in the Canadian petroleum industry on traditional measures of economic fundamentals and traditional proxies for investor sentiment. The sample comprises 631 firms in the Canadian petroleum industry between 1986 and 2001 of which 289 are offerings by regular firms and 342 are offerings by capital pools. *Number of IPOs* and *proceeds* are defined in Table 1. *Oil sales growth* is the growth rate of the revenues of the Canadian petroleum industry in Canadian dollars obtained from Statistics Canada. *GDP growth* is the growth rate of real Canadian GDP in Canadian dollars obtained from Statistics Canada. *Petroleum investment growth* and *TSE Oil & Gas Index return* are growth rates of the corresponding variables defined in Table 1. *NBER contraction at t+1 dummy* equals one if during any month of a particular quarter the NBER determined that a contraction had occurred. *VW closed-end fund discount* the value weighted closed-end fund discount constructed as in Lee, Shleifer, and Thaler (1991) using data from the *Wall Street Journal* at the end of each quarter and checked against share prices and shares outstanding in CRSP where data on these two variables were suspect. We only consider "general" or "diversified" domestic exchange-traded common stock funds. We eliminate a small number of funds for which total net assets are unavailable as well as Baker Fentress and Source Capital to be consistent with Lee, Shleifer, and Thaler (1991). Panel A only reports the coefficient estimate of the variable of interest and the adjusted R^2 of the regression. A constant term is included in the regression but the results are not reported for expositional simplicity. All regressions have 64 calendar quarter observations. ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively. Below each coefficient estimate is its corresponding robust t-statistic in absolute value in parentheses.

Panel A: Using traditional measures of fundamentals and traditional proxies for sentiment individually

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All IPOs	Capital pools only	All IPOs	Capital pools only
Oil sales growth$_{t-1,t+3}$	−0.341	0.484	−0.907	0.289
	(0.87)	(1.17)	(1.52)	(1.15)
Adjusted R^2	−0.007	−0.003	0.013	−0.003
GDP growth$_{t,t+3}$	9.531**	14.734***	6.657	6.495***
	(2.66)	(4.06)	(1.17)	(2.79)
Adjusted R^2	0.088	0.175	0.008	0.085
Petroleum investment growth$_{t,t+3}$	0.288	0.467	0.672	0.211
	(0.60)	(0.90)	(0.93)	(0.67)
Adjusted R^2	−0.010	−0.003	0.000	−0.009
NBER contraction at t+1 dummy	−0.825**	−0.648*	−0.777*	−0.181
	(2.56)	(1.77)	(1.71)	(0.79)
Adjusted R^2	0.098	0.038	0.031	−0.005
TSE Oil & Gas Index return$_{t+1,t+4}$	−0.150	−0.598	−0.863	−0.509
	(0.27)	(0.96)	(1.22)	(1.50)
Adjusted R^2	−0.015	0.001	0.006	0.018
VW closed-end fund discount$_{t-1}$	−6.575**	−4.933	−4.946	−2.712
	(2.03)	(1.06)	(1.01)	(0.95)

Table 3

Continued.

Panel A: Using traditional measures of fundamentals and traditional proxies for sentiment individually

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All IPOs	Capital pools only	All IPOs	Capital pools only
VW closed-end fund discount$_{t-2}$	1.480	−1.368	4.227	0.660
	(0.33)	(0.25)	(0.71)	(0.20)
VW closed-end fund discount$_{t-3}$	5.257	5.826	2.193	1.257
	(1.21)	(1.10)	(0.36)	(0.41)
VW closed-end fund discount$_{t-4}$	5.538	4.067	5.798	1.969
	(1.65)	(0.83)	(1.18)	(0.70)
Adjusted R^2	0.144	0.038	0.021	−0.024

Panel B: Using all traditional measures of fundamentals and all traditional proxies for sentiment

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All IPOs	Capital pools only	All IPOs	Capital pools only
Measures of fundamentals:				
Oil sales growth$_{t-1,t+3}$	−0.755	−0.091	−1.243*	0.106
	(1.59)	(0.17)	(1.77)	(0.32)
GDP growth$_{t,t+3}$	5.737	15.164***	1.189	7.335**
	(1.50)	(2.91)	(0.17)	(2.14)
Petroleum investment growth$_{t,t+3}$	0.201	0.192	0.805	0.058
	(0.56)	(0.45)	(1.26)	(0.20)
NBER contraction at t+1 dummy	−0.453	0.125	−0.785	0.192
	(0.89)	(0.23)	(1.17)	(0.58)
Proxies for investor sentiment:				
TSE Oil & Gas Index return$_{t+1,t+4}$	−0.782*	−1.147**	−1.658**	−0.783**
	(1.75)	(2.10)	(2.34)	(2.37)
VW closed-end fund discount$_{t-1}$	−6.660**	−5.888	−5.126	−3.469
	(2.19)	(1.54)	(1.01)	(1.34)
VW closed-end fund discount$_{t-2}$	1.934	−0.584	5.651	1.397
	(0.46)	(0.12)	(0.84)	(0.41)
VW closed-end fund discount$_{t-3}$	4.268	5.361	0.615	1.376
	(1.09)	(1.13)	(0.10)	(0.45)
VW closed-end fund discount$_{t-4}$	4.141	2.001	5.545	1.430
	(1.39)	(0.50)	(1.03)	(0.56)
Constant	2.528***	1.375***	3.157***	0.699**
	(9.08)	(3.37)	(5.78)	(2.42)
Observations	64	64	64	64
Adjusted R^2	0.200	0.178	0.100	0.066

the closed-end fund discount has long been a standard proxy for sentiment (see Lee *et al*. (1991) and references therein), and realised future stock market returns have also advanced in popular usage in recent years (see Baker and Wurgler, 2000).

Lowry (2003) regresses IPO volume on measures of fundamentals and proxies for sentiment to determine whether or not the first variable is related to either or both of the latter two variables. We use exactly the same leads and lags that she uses and our NBER contraction next quarter dummy and closed-end fund discount variables are the same as hers. However, we tailor her future sales, GDP, and investment growth variables as well as her future stock market returns variable to our setting. Instead of using US economy-wide data for these variables, we use growth in oil sales in Canada, Canadian GDP, and investment in the Canadian petroleum industry, and real returns for the TSE Oil & Gas Index.

Table 3 presents the results. For reference, Lowry (2003) finds that future sales growth is always positively related to IPO volume and is significant in two of three regressions. Her future GDP and investment growth variables as well as her NBER contraction next quarter dummy variable are not significant in any of her regressions. Her results for sentiment are clearly stronger. Her future stock market returns variable as well as one lag of her closed-end fund discount variable are negative and significant in all three of her regressions. We get similar results with our sample to what Lowry (2003) gets for US IPOs in all industries. Higher future GDP growth and a recession next quarter are associated with greater and less equity issuance activity in the current quarter, respectively. Lower future stock market returns and a lower closed-end fund discount are both associated with more equity issuance activity in the current quarter. Overall, by using measures of fundamentals comparable to those in Lowry (2003), we obtain similar results, i.e., the impact of fundamentals on equity issuance seems to be relatively limited.

The reason we focus on firms in the petroleum industry that go public is that sentiment should matter a lot for these firms, and, at the same time, we can obtain more accurate measures of fundamentals. We use the following industry-specific measures of fundamentals: oil production, the number of petroleum rigs operating, the return on equity in the petroleum industry, investment in the petroleum industry, the number of petroleum wells drilled, and the amount of petroleum land sold. These measures of fundamentals are self-explanatory measures of activity and investment in the oil patch. Moreover, it is hard to imagine how they could capture any sentiment. To ascertain whether or not these variables do a good job of explaining equity issuance activity, we regress the number of IPOs in the Canadian petroleum industry and their total proceeds on our industry-specific measures of fundamentals individually and collectively. Table 4 presents the results.

In this table and future tables, we do briefly discuss the economic and statistical significance of our explanatory variables. However, we focus on explanatory power because what we are interested in is how much sentiment really matters for equity issuance above and beyond fundamentals. We note that R^2 is weakly increasing in the number of explanatory variables whereas adjusted R^2 (adjusted for the number of explanatory variables relative to the number of observations) can fall or even become negative as the number of explanatory variables increases. Since we have only 64 quarterly observations and our multiple regressions include as many as 11 explanatory variables, adjusted R^2 is more appropriate in our context than R^2. Furthermore, a number of our multiple regressions pit a number of measures of fundamentals against just one measure of sentiment. Since we wish to allow sentiment to have as much

Table 4

Impact of fundamentals on equity issuance activity using industry-specific measures of
fundamentals

This table presents calendar quarter regressions of measures of equity issuance activity in the Canadian
petroleum industry on industry-specific measures of economic fundamentals in the Canadian petroleum
industry. The sample comprises 631 firms in the Canadian petroleum industry between 1986 and 2001
of which 289 are offerings by regular firms and 342 are offerings by capital pools. Variables are
defined in Table 1. Panel A only reports the coefficient estimate of the variable of interest and the
adjusted R^2 of the regression. A constant term is included in the regression but the results are not
reported for expositional simplicity. All regressions have 64 calendar quarter observations. ***, **, and
* indicate statistical significance at 1%, 5%, and 10%, respectively. Below each coefficient estimate
is its corresponding robust t-statistic in absolute value in parentheses.

Panel A: Using industry-specific measures of fundamentals individually

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All IPOs	Capital pools only	All IPOs	Capital pools only
ln(oil production)	13.315***	15.012***	12.089***	7.562***
	(6.66)	(7.56)	(3.23)	(6.26)
Adjusted R^2	0.376	0.367	0.135	0.248
ln(number of rigs operating)	1.117***	1.278***	1.261***	0.755***
	(4.77)	(3.10)	(3.42)	(3.46)
Adjusted R^2	0.224	0.226	0.127	0.213
Petroleum return on equity	9.132**	14.541***	14.845**	10.581***
	(2.18)	(3.27)	(2.50)	(4.56)
Adjusted R^2	0.035	0.084	0.047	0.128
ln(petroleum investment)	2.301***	2.104***	2.730***	1.288***
	(5.82)	(3.78)	(4.00)	(3.95)
Adjusted R^2	0.234	0.145	0.149	0.148
ln(number of wells drilled)	0.977***	1.045**	1.284***	0.673***
	(3.27)	(2.34)	(3.03)	(2.79)
Adjusted R^2	0.158	0.137	0.125	0.156
ln(petroleum land sold)	0.946***	1.117***	1.198***	0.736***
	(4.80)	(4.93)	(3.42)	(5.34)
Adjusted R^2	0.163	0.176	0.118	0.210

explanatory power as possible, this again argues for using adjusted R^2 to penalise
our measures of fundamentals when they are more numerous than our proxies for
sentiment.

From Table 4, we see that individually our measures of fundamentals are always
statistically significant. When we use all firms, a one-standard deviation increase in
oil production is associated with a 23% increase in IPO volume relative to mean IPO
volume (Column 1). For investment in the petroleum industry, the figure is 18%. For
other measures of fundamentals, the economic impact is similar, both for IPO volume
(Column 1) and total IPO proceeds (Column 3). When we use capital pools only, the

Table 4

Continued.

Panel B: Using all industry-specific measures of fundamentals

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All IPOs	Capital pools only	All IPOs	Capital pools only
ln(oil production)	10.514***	12.345***	8.344*	5.570***
	(3.78)	(4.20)	(1.80)	(3.06)
ln(number of rigs operating)	−0.023	0.475	−0.593	0.150
	(0.04)	(0.72)	(0.67)	(0.35)
Petroleum return on equity	4.542	10.462**	8.398	7.799**
	(1.22)	(2.11)	(1.25)	(2.65)
ln(petroleum investment)	0.969	0.213	1.496	0.271
	(1.33)	(0.25)	(1.29)	(0.53)
ln(number of wells drilled)	−0.045	−0.607	0.514	−0.269
	(0.08)	(0.94)	(0.56)	(0.67)
ln(petroleum land sold)	0.184	0.387	0.296	0.322
	(0.68)	(1.14)	(0.57)	(1.37)
Constant	−2.030	0.029	−2.122	0.775
	(0.61)	(0.01)	(0.36)	(0.31)
Observations	64	64	64	64
Adjusted R^2	0.397	0.407	0.170	0.341

economic impact on IPO volume (Column 2) is much bigger, e.g., 36% for a one-standard deviation increase in oil production.

As for explanatory power, when we use all firms, our measures of fundamentals individually explain from about 4%, in the case of return on equity in the petroleum industry, to about 38%, in the case of oil production (Panel A, Column 1), of the variation in IPO volume. Explanatory power for total IPO proceeds is more modest, typically within a few percentage points of 10% (Panel A, Column 3). Collectively, our measures of fundamentals explain roughly 40% of IPO volume and roughly 17% of total IPO proceeds (Panel B, Columns 1 and 3, respectively). Clearly, for IPO volume, our main variable of interest, our industry-specific measures of fundamentals have impressive explanatory power.[7] When we use capital pools only (Columns 2 and 4), the results are similar.

Of course, it is the impact of sentiment on equity issuance that really interests us. We therefore return to the tests of Table 3 and investigate what happens when we swap the traditional measures of fundamentals for our industry-specific measures of fundamentals. In particular, we wish to learn whether or not we can better explain equity issuance. We also wish to determine the extent to which sentiment retains its explanatory role.

Table 5 presents the result. Our industry-specific measures of fundamentals have quite a bit of explanatory power relative to the traditional measures (compare Panel B of

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[7] The results of Table 4 through Table 7 are similar if we lag or lead our measures of economic fundamentals.

Table 3 to Table 5). When we use all firms, for IPO volume, explanatory power jumps from 20% to 53% (Column 1), whereas for total IPO proceeds the increase is more modest, from 10% to 22% (Column 3). When we use capital pools only (Columns 2 and 4), the results are similar.

The other interesting result pertains to the significance of the proxies for sentiment. When we use the traditional measures of fundamentals collectively in Panel B of Table 3, future stock market returns are always negatively and significantly related to the number of IPOs. When we use our industry-specific measures of fundamentals in Table 5, none of the traditional proxies for investor sentiment are significant. In particular, for future stock market returns, the coefficient estimates drop dramatically and all become statistically insignificant. By contrast, oil production, return on equity in the petroleum industry, and the amount of petroleum land sold remain statistically significant and of similar magnitude as when used individually and alone to explain equity issuance activity (i.e., as in Panel A of Table 4). Evidently, having more accurate measures of fundamentals is critical.

Finally, the incremental explanatory power of sentiment is rather small. That is, relative to the explanatory power of our measures of fundamentals collectively in Panel B of Table 4, the traditional proxies for sentiment add very little explanatory power, from 5 to 13 percentage points.

There are two possible reasons for the results thus far, namely, that either sentiment does not matter or that the traditional proxies for sentiment are not up to snuff. We tackle the second possibility by constructing improved proxies for sentiment. We begin with a comprehensive proxy for sentiment, Baker and Wurgler (2006)'s own composite sentiment variable *SENTIMENT* to which we refer as *BW SENTIMENT*. This variable is constructed as the first principal component of the correlation matrix consisting of the value weighted closed-end fund discount, NYSE turnover, the number of US IPOs in all industries, the mean initial return on US IPOs in all industries, the equity share in new issues, and the dividend premium. We refer the reader to Baker and Wurgler (2006) for justification of the choice of these constituent variables. By construction, *BW SENTIMENT* contains the number of U.S. IPOs in all industries. Now, the number of US IPOs in all industries has a 0.373 correlation (p-value 0.002) with the number of IPOs in the Canadian petroleum industry and a 0.337 correlation (p-value 0.005) with their total proceeds (using regular firms and capital pools). Therefore, we can count on finding at least a mechanical relationship between the number of IPOs in the Canadian petroleum industry and *BW SENTIMENT*, but to be conservative we attribute even this relationship to sentiment.

Next, we use the Michigan Consumer Sentiment Index (MCSI) as a proxy for investor sentiment. Unfortunately, the surveys that underlie consumer sentiment indices ask the people polled about their take on their consumption and the labour market, present and future, so the role of investor sentiment is unclear. Moreover, consumer sentiment indices have been shown to be able to predict future consumer spending (Bram and Ludvigson, 1998), so consumer 'sentiment' may simply capture anticipated future economic activity. Once again, we set aside these caveats and treat the MCSI as a proxy for investor sentiment.

Finally, we follow the behavioural asset pricing literature and suppose that scaled price and liquidity variables at least partially reflect investor sentiment. Hence we use the dividend yield, level, and trading volume of the TSE Oil & Gas Index (see Baker and Stein, 2004) for an argument for why liquidity (and hence turnover) may be a proxy for investor sentiment). While we are agnostic about the extent to which investor sentiment

Table 5

Impact of fundamentals and sentiment on equity issuance activity using industry-specific measures of fundamentals and traditional proxies for sentiment

This table presents calendar quarter regressions of measures of equity issuance on industry-specific measures of economic fundamentals and traditional proxies for investor sentiment. This table is identical to Table 3.B except that traditional measures of fundamentals are swapped for industry-specific measures of fundamentals. The incremental R^2 from sentiment is the adjusted R^2 of a regression minus the adjusted R^2 from the corresponding regression in Table 4.B (which uses all six industry-specific measures of fundamentals as explanatory variables).

	ln(1 + number of IPOs)		*ln(1 + proceeds)*	
	All IPOs	Capital pools only	All IPOs	Capital pools only
Measures of fundamentals:				
ln(oil production)	11.229***	13.826***	10.547**	6.788***
	(3.94)	(4.54)	(2.09)	(3.39)
ln(number of rigs operating)	0.245	0.617	−0.251	0.182
	(0.47)	(0.93)	(0.27)	(0.44)
Petroleum return on equity	9.911***	15.225***	15.250**	9.675***
	(2.95)	(3.24)	(2.24)	(2.84)
ln(petroleum investment)	0.299	−0.359	0.683	0.004
	(0.49)	(0.50)	(0.59)	(0.01)
ln(number of wells drilled)	−0.638	−1.134*	−0.294	−0.507
	(1.35)	(1.89)	(0.35)	(1.34)
ln(petroleum land sold)	0.626**	0.819**	0.928	0.543**
	(2.32)	(2.60)	(1.54)	(2.37)
Proxies for investor sentiment:				
TSE Composite Index return$_{t+1,t+4}$	−0.047	−0.294	0.113	−0.204
	(0.28)	(1.07)	(0.29)	(1.14)
VW closed-end fund discount$_{t-1}$	0.966	3.587	4.036	2.016
	(0.32)	(0.94)	(0.77)	(0.84)
VW closed-end fund discount$_{t-2}$	3.077	1.203	4.959	1.916
	(0.85)	(0.31)	(0.77)	(0.74)
VW closed-end fund discount$_{t-3}$	2.936	3.214	0.279	0.187
	(0.96)	(0.76)	(0.04)	(0.06)
VW closed-end fund discount$_{t-4}$	3.496	3.513	3.231	1.715
	(1.11)	(0.91)	(0.55)	(0.66)
Constant	3.292	4.711	4.485	2.876
	(0.98)	(1.30)	(0.71)	(1.14)
Observations	64	64	64	64
Adjusted R^2	0.529	0.508	0.218	0.393
Incremental R^2 from sentiment	0.132	0.101	0.048	0.052

is industry-specific rather than market-wide, we recognise that industry-specific sentiment is a possibility. Our last three proxies for sentiment have the advantage of being industry-specific.

Armed with our improved proxies for sentiment, we regress the number of IPOs in the Canadian petroleum industry and their total proceeds on our industry-specific measures

of fundamentals and our improved proxies for sentiment. Table 6 presents the results. As before, oil production is always positively related to equity issuance activity. In 18 out of 20 regressions, it is also statistically significant. Similarly, return on equity in the petroleum industry and the amount of petroleum land sold are virtually always positively related to equity issuance activity and at least one or the other tends to be statistically significant in each panel of Table 6. The magnitude of the economic impact of these variables remains similar to what we found in Table 4.

As for our improved proxies for sentiment, when used individually and alone to explain equity issuance activity, they are statistically significant in 18 out of 20 regressions. The coefficient estimates are also of the correct sign (higher values of most proxies for sentiment reflect greater optimism, the exception being the dividend yield, which is lower when optimistic investors push prices up too far relative to dividends). Furthermore, our proxies for sentiment have decent explanatory power when used individually and alone, especially in the case of the dividend yield and trading volume (roughly 25–35% and 15–25%, respectively).

However, when we control for fundamentals, the statistical significance of sentiment often disappears altogether. In fact, the proxies for sentiment that remain statistically significant, namely, the dividend yield and trading volume, are stock market variables and hence the least incontrovertibly attributable to sentiment rather than fundamentals. More importantly, the incremental explanatory power of our proxies for sentiment (as before, incremental to the explanatory power of fundamentals in Panel B of Table 4) is never more than 11 percentage points and tends to be in the range of 1–2 percentage points. Compare this to the roughly 40% of the variation in IPO volume explained by fundamentals (Table 4, Panel B, Column 1). The results for capital pools only are similar in terms of statistical significance and explanatory power to the results for all firms. In short, while our proxies for sentiment individually and alone do a decent job of explaining equity issuance, their role diminishes, often drastically, when we control for fundamentals. Since we can be confident about the accuracy of our measures of fundamentals, the results suggest that our proxies for sentiment contain quite a large component of fundamentals. Moreover, industry-specific proxies for sentiment seem to do a better job of explaining equity issuance than the traditional (economy-wide) proxies for sentiment.

To ensure that the horse race between fundamentals and sentiment is fair, we further investigate the extent to which all of our improved proxies for sentiment collectively explain equity issuance. Specifically, we replicate the regressions of the various panels of Table 6 except that we include all improved proxies for sentiment together.

Table 7 presents the results, which are much as they were in Table 6. All proxies for sentiment together explain an impressive 25–40% of the variation in equity issuance. However, when we control for fundamentals, the incremental explanatory power of sentiment drops and is at most 12 percentage points, which is almost exactly the maximum that we found in Table 6. Looking back at Tables 6 and 7, our results are slightly stronger for capital pools alone than for all firms when we consider statistical significance but slightly weaker for capital pools when we consider explanatory power. On balance, therefore, the results for capital pools, a sub-sample of small, young, and risky firms that should be acutely subject to sentiment, are not that different from the results for the whole sample. We note that the results are unchanged when we use Baker and Wurgler (2006)'s *SENTIMENT*$\perp$ variable, which is constructed from constituent variables that are orthogonalised with respect to fundamentals. To reiterate, we have been generous with investor sentiment by ascribing to *BW SENTIMENT* only

Table 6

Impact of fundamentals and sentiment on equity issuance activity using all industry-specific measures of fundamentals and *BW SENTIMENT*, *Michigan Consumer Sentiment Index*, and all improved proxies for sentiment individually.

This table presents calendar quarter regressions of measures of equity issuance on all industry-specific measures of economic fundamentals and individual improved proxies for investor sentiment. The sample comprises 631 firms in the Canadian petroleum industry between 1986 and 2001 of which 289 are offerings by regular firms and 342 are offerings by capital pools. Variables are defined in Table 1. ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively. Below each coefficient estimate is its corresponding robust t-statistic in absolute value in parentheses. The incremental R² from sentiment is its corresponding R² of a regression minus the adjusted R² from the corresponding regression in Table 4.B (which uses all six industry-specific measures of fundamentals as explanatory variables).

Panel A: Using BW SENTIMENT as proxy for sentiment

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All firms	Capital pools only	All firms	Capital pools only
Measures of fundamentals:				
ln(oil production)	10.509***	12.333***	8.342*	5.562***
	(3.74)	(4.07)	(1.78)	(2.96)
ln(number of rigs operating)	−0.095	0.269	−0.624	0.017
	(0.18)	(0.39)	(0.72)	(0.04)
Petroleum return on equity	2.900	5.744	7.685	4.763
	(0.75)	(1.03)	(1.02)	(1.31)
ln(petroleum investment)	0.821	−0.212	1.432	−0.002
	(1.09)	(0.25)	(1.11)	(0.00)
ln(number of wells drilled)	−0.033	−0.575	0.519	−0.249
	(0.06)	(0.84)	(0.56)	(0.57)
ln(petroleum land sold)	0.299	0.719**	0.346	0.535**
	(0.92)	(2.12)	(0.54)	(2.32)
Proxy for investor sentiment:				
BW SENTIMENT	0.347*	0.522***	0.373	0.327***
	(1.84)	(2.70)	(1.36)	(2.90)
BW SENTIMENT	0.127	0.364*	0.055	0.234*
	(0.75)	(1.93)	(0.18)	(1.88)
Constant	2.024***	1.357***	2.174***	0.648***
	(17.59)	(11.11)	(13.40)	(9.35)
Constant	−1.184	2.461	−1.755	2.339
	(0.33)	(0.68)	(0.26)	(0.97)
Observations	64	64	64	64
Adjusted R²	0.043	0.087	0.016	0.094
Adjusted R²	0.392	0.429	0.156	0.366
Incremental R² from sentiment	−0.005	0.022	−0.014	0.025

Table 6

Continued.

Panel B: Using the Michigan Consumer Sentiment Index as proxy for sentiment

		ln(1 + number of IPOs)		ln(1 + proceeds)	
		All firms	Capital pools only	All firms	Capital pools only
Measures of fundamentals:					
ln(oil production)		11.023***	12.122***	9.607*	5.117***
		(3.66)	(3.81)	(1.92)	(2.69)
ln(number of rigs operating)		0.124	0.411	−0.228	0.019
		(0.18)	(0.53)	(0.25)	(0.04)
Petroleum return on equity		5.500	10.043*	10.774*	6.946**
		(1.56)	(1.87)	(1.72)	(2.13)
ln(petroleum investment)		1.049	0.178	1.694	0.200
		(1.61)	(0.21)	(1.54)	(0.38)
ln(number of wells drilled)		−0.179	−0.548	0.180	−0.149
		(0.29)	(0.75)	(0.21)	(0.33)
ln(petroleum land sold)		0.143	0.405	0.196	0.358
		(0.54)	(1.14)	(0.38)	(1.49)
Proxy for investor sentiment:					
Michigan Consumer Sentiment Index	0.022*	−0.007	0.003	−0.017	0.006
	(1.86)	(0.43)	(0.22)	(0.87)	(0.89)
Michigan Consumer Sentiment Index		0.033***		0.020***	
		(3.52)		(4.01)	
Constant	0.128	−1.684	−0.122	−1.263	−1.115**
	(0.12)	(0.46)	(0.03)	(0.21)	(2.35)
		−1.517*		1.010	
		(1.70)		(0.61)	
Observations	64	64	64	64	64
		64		64	
Adjusted R²	0.063	0.392	0.397	0.170	0.338
		0.123		−0.001	0.126
Incremental R² from sentiment		−0.005	−0.010	0.000	−0.003

Panel C: Using TSE Oil & Gas Index D/P as proxy for sentiment

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All firms	Capital pools only	All firms	Capital pools only
Measures of fundamentals:				
ln(oil production)	8.707***	10.750***	5.530	4.890***
	(3.76)	(4.21)	(1.38)	(2.79)
ln(number of rigs operating)	−0.475	0.077	−1.296	−0.020
	(0.98)	(0.13)	(1.42)	(0.05)
Petroleum return on equity	0.328	6.742	1.834	6.213**
	(0.09)	(1.50)	(0.26)	(2.05)
ln(petroleum investment)	0.847	0.105	1.306	0.225
	(1.20)	(0.13)	(1.17)	(0.46)
ln(number of wells drilled)	0.456	−0.165	1.294	−0.081
	(0.93)	(0.31)	(1.33)	(0.22)
ln(petroleum land sold)	−0.047	0.183	−0.063	0.235
	(0.20)	(0.55)	(0.14)	(0.98)
Proxy for investor sentiment:				
TSE Oil & Gas Index D/P	−168.804***	−184.995***	−213.982***	−98.193***
	(6.06)	(5.87)	(4.90)	(4.86)
	−111.819***	−98.727***	−174.192***	−42.099*
	(4.09)	(2.84)	(3.43)	(1.76)
Constant	6.008***	5.764***	7.205***	3.002***
	(9.83)	(8.00)	(7.26)	(6.35)
	−1.268	0.703	−0.934	1.062
	(0.41)	(0.19)	(0.17)	(0.43)
Observations	64	64	64	64
	64	64	64	64
Adjusted R²	0.351	0.323	0.261	0.244
	0.499	0.464	0.283	0.363
Incremental R² from sentiment	0.102	0.057	0.113	0.022

Table 6
Continued.

Panel D: Using TSE Oil & Gas Index level as proxy for sentiment

In the table below, each sample ("All firms" and "Capital pools only") reports two specifications: a fundamentals-plus-sentiment regression (values with fundamentals shown) and a sentiment-only regression. t-statistics are in parentheses.

	ln(1 + number of IPOs)				ln(1 + proceeds)			
	All firms		Capital pools only		All firms		Capital pools only	
Measures of fundamentals:								
ln(oil production)	10.309*** (3.60)		12.829*** (4.29)		8.154* (1.69)		5.905*** (3.22)	
ln(number of rigs operating)	−0.120 (0.24)		0.705 (0.93)		−0.683 (0.71)		0.309 (0.61)	
Petroleum return on equity	3.294 (0.79)		13.411** (2.55)		7.243 (0.94)		9.839*** (3.29)	
ln(petroleum investment)	1.012 (1.34)		0.110 (0.13)		1.536 (1.28)		0.200 (0.40)	
Ln(number of wells drilled)	0.000 (0.00)		−0.713 (1.07)		0.555 (0.59)		−0.342 (0.80)	
Ln(petroleum land sold)	0.187 (0.69)		0.379 (1.13)		0.299 (0.57)		0.316 (1.39)	
Proxy for investor sentiment:								
TSE Oil & Gas Index level		1.578*** (3.46)	−0.748 (0.94)	1.557** (2.59)	0.293 (0.28)	1.769** (2.48)	−0.517 (1.05)	0.905** (2.64)
Constant	−2.424 (0.70)	0.858** (2.23)	0.959 (0.25)	0.258 (0.52)	−2.486 (0.42)	0.863 (1.46)	1.418 (0.54)	0.016 (0.06)
Observations	64	64	64	64	64	64	64	64
Adjusted R^2	0.389	0.098	0.407	0.070	0.156	0.051	0.344	0.063
Incremental R^2 from sentiment	−0.008		0.000		−0.014		0.003	

Panel E: Using ln(TSE Oil & Gas Index trading volume) as proxy for sentiment

	ln(1 + number of IPOs)				ln(1 + proceeds)			
	All firms		Capital pools only		All firms		Capital pools only	
Measures of fundamentals:								
ln(oil production)		9.616*** (3.36)		11.523*** (3.96)		7.502 (1.59)		5.207*** (2.93)
ln(number of rigs operating)		−0.592 (1.14)		−0.045 (0.07)		−1.127 (1.13)		−0.080 (0.17)
Petroleum return on equity		1.382 (0.40)		7.570 (1.46)		5.434 (0.81)		6.520** (2.06)
ln(petroleum investment)		0.801 (1.18)		0.059 (0.07)		1.338 (1.17)		0.203 (0.40)
ln(number of wells drilled)		−0.079 (0.15)		−0.638 (1.09)		0.482 (0.51)		−0.283 (0.74)
ln(petroleum land sold)		0.477* (1.73)		0.656* (1.82)		0.572 (1.06)		0.441* (1.76)
Proxy for investor sentiment:								
ln(TSE Oil & Gas Index trading volume)	1.308*** (4.31)	0.971*** (3.00)	1.391*** (3.48)	0.889*** (2.70)	1.369*** (2.98)	0.911 (1.50)	0.741*** (3.40)	0.393* (1.70)
Constant	−3.090** (2.50)	−4.383 (1.25)	−4.039** (2.57)	−2.124 (0.54)	−3.176* (1.71)	−4.329 (0.70)	−2.214** (2.59)	−0.177 (0.07)
Observations	64	64	64	64	64	64	64	64
Adjusted R^2	0.272	0.474	0.235	0.452	0.132	0.191	0.177	0.360
Incremental R^2 from sentiment		0.077		0.045		0.021		0.019

Table 7

Impact of fundamentals and sentiment on equity issuance activity using all industry-specific measures of fundamentals and *BW SENTIMENT*, *Michigan Consumer Sentiment Index*, and all improved proxies for sentiment

This table presents calendar quarter regressions of measures of equity issuance on all industry-specific measures of economic fundamentals and all proxies for investor sentiment. This table is identical to the various panels in Table 6 except that all sentiment proxies are included together.

	ln(1 + number of IPOs)		ln(1 + proceeds)	
	All firms	Capital pools only	All firms	Capital pools only
Measures of fundamentals:				
ln(oil production)	9.394***	11.384***	6.990	4.929**
	(3.28)	(3.74)	(1.48)	(2.63)
ln(number of rigs operating)	−0.642	−0.062	−1.094	−0.151
	(1.04)	(0.08)	(1.07)	(0.28)
Petroleum return on equity	−3.230	3.392	−0.303	4.112
	(0.80)	(0.65)	(0.03)	(1.04)
ln(petroleum investment)	0.537	−0.643	1.047	−0.234
	(0.83)	(0.84)	(0.90)	(0.48)
ln(number of wells drilled)	0.143	−0.402	0.927	−0.109
	(0.27)	(0.68)	(0.91)	(0.26)
ln(petroleum land sold)	0.379	0.750**	0.175	0.538**
	(1.15)	(2.07)	(0.28)	(2.08)

Proxies for investor sentiment:								
BW SENTIMENT	0.212	0.323**	0.367**	0.509**	0.422	0.399	0.233**	0.273*
	(1.35)	(2.29)	(2.25)	(2.65)	(1.49)	(1.24)	(2.02)	(2.00)
MCSI	0.001	−0.012	0.009	−0.006	−0.015	−0.021	0.007	0.001
	(0.05)	(0.93)	(0.95)	(0.53)	(0.99)	(1.14)	(1.14)	(0.16)
TSE Oil & Gas Index D/P	−134.985***	−93.166***	−162.039***	−98.846**	−212.115***	−182.513***	−86.337***	−46.774
	(3.97)	(2.88)	(3.18)	(2.32)	(4.29)	(3.04)	(2.74)	(1.52)
TSE Oil & Gas Index level	−0.059	−0.003	−0.429	−1.018	−0.080	−0.151	−0.167	−0.624
	(0.11)	(0.01)	(0.62)	(1.36)	(0.09)	(0.14)	(0.38)	(1.22)
ln(TSE Oil & Gas Index trading volume)	0.489	0.546	0.323	0.502	0.217	0.065	0.108	0.214
	(1.38)	(1.51)	(0.59)	(1.25)	(0.40)	(0.10)	(0.36)	(0.74)
Constant	3.219	0.055	3.316	4.459	7.636***	2.880	1.705	3.117
	(1.61)	(0.01)	(1.13)	(1.06)	(2.67)	(0.44)	(0.99)	(1.01)
Observations	64	64	64	64	64	64	64	64
Adjusted R^2	0.379	0.517	0.389	0.521	0.250	0.260	0.311	0.402
Incremental R^2 from sentiment		0.120		0.114		0.090		0.061

a sentiment explanation whereas the constituent sentiment proxies very likely contain fundamentals. We also note that our results are unchanged if in Table 7 we only include either the dividend yield or the level of the TSE Oil & Gas Index, so our results are not driven by the correlation between these two variables.

In summary, we have examined aggregate equity issuance activity and focused on IPOs because IPO firms are presumably the type of firms most subject to investor sentiment. At the same time, by further focusing our analysis on IPOs in the petroleum industry, we gained the advantage of having accurate measures of economic fundamentals. We also constructed improved proxies for investor sentiment by using scaled price and liquidity variables among others. The results clearly show that while investor sentiment on its own explains some of the variation in equity issuance activity, both its statistical significance and its explanatory power dissipate once we account for economic fundamentals. Of course, it is possible that with even better proxies for investor sentiment, we would find better statistical significance and explanatory power for sentiment than we currently do. At the very least, however, our strong results for economic fundamentals and weak results for investor sentiment indicate that researchers be cautious about using measures of aggregate equity issuance activity to uncover evidence of market irrationality. This is especially true if investors are overoptimistic or overpessimistic when fundamentals are actually very good or bad, respectively.

4. Conclusion

We study the extent to which investor sentiment matters for aggregate equity issuance activity. We focus on firms that are susceptible to investor sentiment but for which accurate measures of economic fundamentals are available. For this reason, we focus on IPOs in the Canadian petroleum industry. We run a horse race between fundamentals and sentiment in terms of their impact on equity issuance. While sentiment on its own matters for equity issuance and sometimes even has impressive explanatory power, it matters relatively little once we control for fundamentals. Collectively, all proxies for sentiment explain around 10 percentage points of equity issuance beyond the roughly 40% explained by fundamentals. The results are largely unchanged when we focus on a sub-sample of firms that should be acutely subject to investor sentiment, namely, particularly small, young, and risky firms. We conclude that, both on its own and relative to economic fundamentals, investor sentiment has a fairly limited role in explaining aggregate equity issuance activity.

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