When government co-invests in mining projects:

An empirical study of Canadian

Flow-Through Shares

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Monica Jane Axiak, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy (Accounting), in the Business School at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis. This document has not been submitted for qualifications at any other academic institution.

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WHEN GOVERNMENT CO-INVESTS IN MINING PROJECTS:

AN EMPIRICAL STUDY OF CANADIAN FLOW-THROUGH SHARES

ABSTRACT

This thesis conducts an empirical investigation of the Canadian Flow-Through Shares (FTS) scheme. FTS are a type of common share unique to Canada which entitle the initial purchaser to a full tax deduction equal to the amount invested in FTS, and various other tax benefits depending on their tax status and residency. This thesis examines a number of research questions associated with FTS, including: the characteristics of FTS issuers; the determinants of the FTS issuance premium; the share price reaction to the FTS issue announcement; and FTS audit pricing implications. The thesis seeks to address the limited empirical research published on different aspects of FTS to date, since the issuance of FTS is becoming increasingly widespread amongst eligible firms which are mostly mineral exploration entities (MEEs), a unique sample of venture firms sharing a similar inherent risk profile and business objectives. This thesis finds investors prefer other types of SEO deals compared to FTS, which can be used to fund a wider range of activities including offshore exploration. When participating in FTS deals investors are willing to pay a greater premium to access the tax deduction format of tax benefit (rather than tax credits). Davidson & Company is identified as the audit market leader servicing Canadian MEEs and FTS issuing MEEs are found to pay lower audit fees than their non-FTS issuing counterparts. Evidence of industry leader and Big 4 premiums is identified amongst FTS issuing audit clients.

Keywords: Flow-through shares; Tax shelters; Mineral exploration entities; Venture firms.

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1.0 INTRODUCTION

1.1 Thesis overview

This thesis conducts an exploratory empirical investigation into Canada's Flow-Through Shares (FTS) scheme. FTS are a type of common share unique to Canada. Specifically, FTS entitle the initial purchaser to claim an income tax deduction equal to the resource expenses renounced by the issuing firm, up to the amount paid by the purchaser (Gravelle 2012). The FTS scheme was introduced by the Canadian Government to encourage investment in the Canadian mining industry, and is based on the assumption that tax deductions arising from exploration and development expenditures incurred by such firms are more valuable to FTS holders than the corporation itself (Fitzgerald 2012). The scheme represents a means of de-risking, and subsequently incentivising investment into, the high-risk junior mineral exploration sector. Thus, the Canadian Government effectively co-invests in mining projects where FTS deals are used for capital raising. This works to alleviate the agency problems associated with information asymmetry in the junior exploration sector and provide tax-effective exposure to mining project upside.

This thesis seeks to examine a number of research questions associated with FTS. Chapter 2 will firstly explore the characteristics of FTS issuers and subsequently examines the determinants of the FTS issuance premium on a subsample of FTS deals. Chapter 3 will address the share price reaction to the FTS issue announcement, and Chapter 4 will examine audit pricing implications for FTS issuers.

1.2 Motivation

There are four motivations underpinning this thesis. Firstly, the issuance of FTS is becoming increasingly widespread amongst eligible firms which are mostly mineral exploration entities (MEEs). With reference to Table 2.1, the number of FTS issues

increased by 505% between 2001 and 2019 on the TSX Venture Exchange (TSXV) alone. The FTS program has raised C$4.5 billion for junior exploration firms between 2011 and 2018, and is economically significant, accounting for over 65% of funds raised on Canadian stock exchanges for exploration purposes. It accounts for almost 30% of the total number of common share issues on the Toronto Stock Exchange (TSX) and TSXV between 2007 and 2012 (Department of Finance Canada 2013). A number of FTS limited partnerships investing in FTS portfolios have also emerged in the Canadian market as a managed fund investment alternative, where the partnership's portfolio manager invests in the FTS of resource companies on behalf of the partnership's unit-holders. This demonstrates the prevalence of (and interest in) FTS as an equity instrument in Canada.

Given the economic significance of FTS, the Canada Revenue Agency (CRA) has published extensive instructions and materials regarding the FTS program, its rules, and the compliance requirements associated with being an FTS issuer, all of which are readily accessible to the public. This further highlights the prevalence of the FTS program in the Canadian market and the regulatory importance of the program itself. In turn, this is reflective of the large proportion of microcap exploration firms listed in Canada, since resource exploration firms which meet specific criteria are the only firms eligible to issue FTS. Canada also has the largest number of listed mining company worldwide.

Thirdly, the Australian Government recently introduced the Junior Minerals Exploration Incentive.[1] The scheme functions in much the same way as the FTS program, and is intended to incentivise investment in the junior Australian mining sector through the distribution of 'exploration [tax] credits' which entitle the investor

[1] Originally introduced as the Exploration Development Incentive in 2014.

to a refundable tax offset.[2] Studying the mature Canadian FTS program can yield valuable insights for Australian policymakers, mining industry participants and investors around the potential long-term firm-level and economic impacts of the Junior Minerals Exploration Incentive.

Limited academic work has been published on different aspects of FTS, despite the program representing a form of corporate tax shelter, and resembling the basic structure of the scheme implemented in the mid-1970s. Data limitations have hindered empirical attempts to study this area to date (Shackelford & Shevlin 2001). The extant literature has investigated various aspects of initial public offerings (IPOs) and seasoned equity offerings (SEOs). FTS are another type of SEO, in that they represent additional shares issued (either on a private or public basis) by existing companies that already have securities trading in the secondary market. Section 1.3 provides further detail regarding the issue and mechanics of FTS. As such, the Canadian FTS program represents an interesting area of study due to the lack of existing research, the longevity and increased usage of the scheme, and its relevance to tax practice pertaining to the mining and exploration industry. Understanding flow-through entities is of policy and scholarly interest due to the complexity of these transactions from a tax perspective, and the role of the Canadian Government in incentivising investment in the MEE sector.

MEEs, similar to biotechnology research and development (R&D) firms, are characterised by high levels of information asymmetry, long project life cycles and high risk (Ferguson & Lam 2021). Market frictions such as information asymmetry and moral hazard determine the existence and optimal shape of all institutional characteristics, including accounting and auditing (Ball & Brown 2019). The information problem in the MEE sector largely rests upon managers holding superior

[2] Refer to Section 1.3.3 for further information regarding the Australian scheme.

private technical information about the firm's mineral projects unknown to shareholders and the market (Jensen & Meckling 1976). Furthermore, MEEs are mostly evaluated based on their ore reserves and/or their discovery prospects (Ferguson & Pundrich 2015), and it is difficult to predict whether a project will be amongst the 0.9% which successfully discovers an economically viable orebody (Bartrop & Guj 2009) at the grassroots exploration phase.[3] These information asymmetries give rise to agency problems and the risk of moral hazard, where managers might organise opportunities, costs and risks in a manner which serves their own interests at the expense of investors (Iddon, Hettihewa & Wright 2013). All of these factors are features of the MEE setting and would contribute to the reluctance of prospective investors[4] when considering investments in MEEs, and contribute to high levels of project failure in the sector (Ferguson, Clinch & Kean 2011).

Such information asymmetries pose a challenge for MEEs reliant on equity funding (Bui, Ferguson & Lam 2021). From the perspective of the pecking order theory (Myers & Majluf 1984), Canadian MEEs are without sources of internal funding (that is, retained earnings) and are typically unable to obtain private debt finance until the mine development phase.[5] Thus, MEEs rely on external equity financing such as FTS to fund exploration activities.

The literature documents how taxes impact corporate decision-making since higher taxes reduce anticipated profits. This is especially the case with respect to risky projects

[3] Furthermore, there is only a 0.3% chance of discovering a major orebody and a 0.07% chance of discovering a world-class orebody (Bartrop & Guj 2009).
[4] Such investors may not be trained in the scientific and technical aspects of the exploration industry, or familiar with the technical terminology.
[5] Edwards, Schwab & Shevlin (2016) describe firms as financially constrained if they are subject to high costs of external financing or have difficulty obtaining external funding. They find firms facing such constraints are associated with decreasing cash effective tax rates, thus increasing cash tax savings and generating a source of internal funding. MEEs are unable to generate cash savings through tax planning in this manner because they are consistently unprofitable (thus do not have tax liabilities).

where government shares in firm upside, but not downside (Ljungqvist, Zhang & Zuo 2017). By enabling the FTS program, the Canadian Government effectively co-invests in mineral exploration activities in Canada by mitigating investor losses (through tax incentives), in the likely event the MEE is unsuccessful in making an economic mineral discovery.

Government support of high-risk enterprise can manifest in various ways, including equity finance, grants, loans, tax subsidies and other schemes (Lach, Neeman & Schankerman 2021). Such support can be an effective means of mitigating under-supply in innovation due to information asymmetries which can lead to adverse selection and/or moral hazard issues (Brander, Du & Hellmann 2015), given that expected agency costs increase where assets become less tangible, and growth options and asset specificity increase (Gompers 1995). While private investors are interested in financial returns and can add value to start-ups through monitoring and advisory services, governments are focused on the generation of positive externalities (Bai et al. 2022). Investing in venture firms and monitoring their progress requires specialised expertise which governments do not have (Gompers & Lerner 1999),[6] however governments are in a position to aid such firms through the creation of favourable economic policies and/or financial collaboration with private capital investors.[7]

Firstly, governments can directly participate in the venture capital space by providing equity financing. Critics doubt the ability of governments to add value in this manner, suggesting government involvement can be associated with issues such as political lobbying, rent-seeking and bureaucratic inefficiency (Brander, Du & Hellmann 2015).

[6] Government monitoring of MEE compliance with FTS program rules is limited to that conducted by the CRA.
[7] Examples of such collaborations can occur through joint equity investments and matching-funds requirements (Bai et al. 2022).

Grilli & Murtinu (2014) study the impact of government-managed and independent venture capital funds on European high-tech entrepreneurial firms. Consistent with Gompers & Lerner (1999), the results reflect poorly on the government's ability to support such firms when operating directly in the venture capital market. Alternatively, governments can provide financial support in the form of loans to entrepreneurial ventures. Bertoni, Marti & Reverte (2019) examine government-sponsored participative loans in the Spanish setting, and find a positive effect on the employment and sales of beneficiary firms, particularly high-tech, young and small entrepreneurial ventures. Finally, governments can also provide indirect support through the establishment of tax incentives and/or programs which encourage venture capital activity, reduce administrative requirements for certain firms, etc. (Bernstein, Giroud & Townsend 2016).

Lach, Neeman & Schankerman (2021) argue that governments should confine their support of venture firms to those which generate substantial positive externalities with an intermediate probability of success, avoiding firms with the lowest probability of success. MEEs are undoubtedly categorised as firms with a low probability of success given there is only a 0.9% chance of discovering an economically viable orebody (Bartrop & Guj 2009). However, MEEs represent the potential generation of significant positive externalities through employment opportunities and tax revenues in the event a mining exploration project is successful.

In this regard, the FTS program represents an alternative means of indirect government support through the introduction of investor tax incentives to encourage investment into a high-risk sector, where providing tax benefits directly to venture firms is of no value.[8]

[8] Following the Brander, Du & Hellmann (2015) conceptual framework, government venture capital in the context of FTS is equivalent to the value of tax benefits provided to private investors, which increase the attractiveness of FTS investments.

This is because MEEs may not record revenue for a number of years (if ever), and therefore have little to no income against which to offset their exploration and development expenses for tax purposes. Following the Bai et al. (2022) conceptual framework, while the Canadian Government does not have a direct ownership stake in any MEE, it allows private investors the opportunity to do so at a subsidised rate through favourable policy arrangements which provide tax benefits (enabling tax-effective exposure to mining project upside, while providing a degree of downside protection). This approach makes investment more affordable for private parties without exposing the Government to downside risk and jeopardising public resources beyond the tax revenue foregone by allowing tax deductions and credits in association with the FTS program.[9] [10] Furthermore, the program's use of proceeds requirements mandate that all funding raised through FTS must be used by MEEs for eligible exploration expenditures, thus mitigating agency and monitoring costs.[11] Such monitoring is conducted by the CRA and relevant provincial tax authorities, and involves several compliance and reporting requirements.[12]

The FTS program is of academic interest because it represents a form of government support which enhances the ability of MEEs to obtain project funding while alleviating the agency problems associated with information asymmetry through use of proceeds

[9] Lach, Neeman & Schankerman (2021) discourage the investment of public resources in projects with a low probability of success.

[10] It should be noted that governments around the world offer tax deductions and credits for various reasons (e.g. unreimbursed work-related expenses, low income, etc.), many of which are sunk costs with little prospect of generating future direct benefits for the government offering them. In the case of tax deductions and credits associated with FTS, however, the Canadian Government benefits from capital gains tax revenue from investors and income tax revenue derived from discoveries made by MEEs. This is inherently different to the downside risk the Canadian Government would be exposed to if it were to invest public funds into MEEs directly.

[11] According to Bernstein, Giroud & Townsend (2016), a reduction in monitoring costs should translate to better venture firm performance.

[12] MEEs must adhere to reporting requirements by making lodgements with the CRA and provincial tax authorities (within specific timeframes) to be eligible to offer FTS and subsequently renounce eligible expenditures. Such lodgements include (but are not limited to): T100A (application for a selling instrument identification number); T100B (details of the FTS subscribed); and T101A (renunciation of Canadian exploration and development expenditures).

and mandatory reporting requirements. It also provides investors with concurrent tax-effective exposure to mining project upside, and partial downside protection. The Government forgoes some tax revenue from private investors to enable the FTS program. In return for establishing this framework, the Canadian Government benefits from capital gains tax revenue whenever FTS are disposed (representing compensation from private investors). The Government also benefits from mining project upside in the form of employment creation and tax revenues from MEEs in the event of an economic discovery (the chance of which increases with the additional exploration activity the FTS program generates).

1.3 Overview of the Canadian FTS scheme

Axiak (2018) provides a comprehensive overview of the Canadian FTS scheme, including the mechanics of the scheme, taxation treatment of FTS and the general effectiveness of the scheme. This overview is provided below:[13]

> "FTS are a type of common share issued in Canada which entitle the initial purchaser to claim an income tax deduction equal to the resource expenses renounced by the issuer, up to the amount of the price paid by the purchaser (Gravelle 2012). FTS can only be issued and maintained by a principal business corporation (PBC), which is a mineral mining or resource exploration company. As such, the FTS scheme was introduced to encourage investment in the Canadian mining industry and is based on the assumption that tax deductions arising from exploration and development expenditures incurred by PBCs are more valuable to FTS holders than the corporation itself (Fitzgerald 2012). This is because mining and exploration companies may not record revenue for a number of years

[13] Section 1.3 is adapted and elaborates upon on a section of an Honours thesis previously submitted for assessment in another degree (Axiak 2018).

(if ever) until their project(s) enter production and therefore have little to no income against which to offset their exploration and development expenses for tax purposes.[14]

When first introduced in 1954, FTS were only available on a company-to-company basis. By the early 1970s, FTS were made available to individual investors who could make use of the exploration and development expenditures. By 1976, the FTS program exhibited the basic features that characterise FTS today, namely, the full tax deductibility of the initial investment in FTS. As explained in the following sub-sections, the FTS program has continued to develop with the design of additional incentives.

1.3.1 Mechanics of the FTS scheme

At a high-level, once a PBC issues FTS it covenants to incur and renounce qualifying expenditures equal to the amount of capital obtained through the FTS subscription proceeds. The corporation renounces, or passes on, these expenses to the FTS holder, which effectively means that for tax purposes, these expenses are treated as though they are borne by the shareholder. As such, the shareholder is entitled to claim a tax deduction for the amount of the renounced qualifying expenditures by way of their federal and provincial income tax returns in the financial year the expenses are renounced to them. It should be noted that only the initial purchaser of the FTS is entitled to renunciation (that is, the subscriber for the FTS with the PBC), and subsequent buyers of the FTS are not. Refer to

[14] Exploration companies are typically low marginal tax rate firms. A firm's current period marginal tax rate is defined as the change in the present value of the cash flow paid to (or recovered from) the tax authorities as a result of earning one extra dollar of taxable income in the current period (Shevlin 1990). For an exploration firm with tax losses undertaking a risky project, there is a non-zero probability that the losses will never be used, so its current period marginal tax rate will be near zero. Cooper & Knittel (2006) find that up to 30% of tax losses are never used.

Figure 1.1 for a diagram on the mechanics and other technical aspects of the FTS scheme.

[Insert Figure 1.1]

The tax residency status of the FTS holder determines the extent to which they can claim a tax deduction for qualifying expenditures renounced to them. Canadian tax resident FTS holders are entitled to claim qualifying expenditures attached to their FTS holdings, even if this exceeds the income reported in their tax return, in turn creating a non-capital loss. The Canadian tax rules allow non-capital losses to be carried back and applied against income reported from all sources in the last three years, or carried forward a maximum of twenty years.[15] Foreign residents (non-residents for tax purposes in Canada) are eligible to deduct qualifying expenditures to the extent of their taxable income in Canada (that is, foreign residents are not eligible to accumulate non-capital losses).[16]

Eligible expenses

Certain expenses are eligible for renunciation, or flow-through, to FTS holders. These can be categorised as 'grassroots' and pre-production expenditures (Gravelle 2012). Grassroots expenditures refer to those expenses incurred to determine the existence, location, extent or quality of a mineral resource in Canada. Examples of such expenses include: geological, geophysical and geochemical surveys, assay expenses, prospecting, drilling, trenching and preliminary sampling.

[15] The twenty year carry-forward is available for tax years ending after 2005.
[16] Consistent with most jurisdictions, Canada seeks to tax resident taxpayers on worldwide income, and foreign (or non-resident) taxpayers on their Canada source income only.

Pre-production expenditures refer to those which are incurred to bring a new mine into production in Canada, in reasonable commercial quantities. They must be incurred before a new mine can enter production in commercial quantities. Examples of these expenses include: clearance and removal of overburden, stripping, sinking a mine shaft, adit construction and/or other underground entry (known in the industry as a 'decline').

The CRA provides some examples of expenses which do not qualify for renunciation to FTS holders. These include: the acquisition cost of a mineral property, the capital cost of depreciable property (such as drilling equipment and the construction of housing facilities), overhead expenses, feasibility study costs associated with assessment of mine development options and profitability, compliance and share issuance costs, community consultation costs, and costs of environmental assessments required to obtain permits.

Renunciation timeframe

For qualifying expenses to be eligible for flow-through to FTS holders, they must be incurred in the period beginning on the date the FTS share subscription agreement is signed, and ending 24 months after the end of the month in which the subscription agreement is signed. The renunciation must then occur before March of the first calendar year which begins after this 24-month period expires. Figure 1.2 summarises this by way of a timeline. As noted previously, the amount of expenses renounced by a PBC cannot exceed the proceeds raised by way of issuing FTS. At the individual FTS holder level, this means qualifying expenses claimed as a tax deduction cannot exceed the amount paid for the FTS holdings" (Axiak 2018, pp. 16-9).

Where the PBC fails to incur and renounce eligible expenses within the legislated timeframe, the expenses renounced to shareholders would be less than the amount paid for the shares. In this scenario, the PBC is subject to a 10% penalty tax, and is usually liable to indemnify FTS holders for any tax they are required to pay as a result of its failure to adhere to the renunciation timeframe.

[Insert Figure 1.2]

The 'look-back' rule

The 'look-back' rule allows PBCs to accelerate the renunciation of grassroots expenses to FTS holders before the company actually incurs the expense. Assume a PBC completes an FTS deal in 2020 (that is, the deal is closed and investors pay to participate in the FTS issue). If the PBC proceeds to incur grassroots exploration expenditures in the following year (2021), the company can renounce the expenses to investors in the first three months of 2021. The expenses are then deemed to have been incurred and renounced on 31 December 2020, enabling investors to claim the deduction in the 2020 financial year. This provision means investors are not required to wait for the PBC to actually incur qualifying expenses (which can usually take up to 24 months). Most FTS deals are structured to take advantage of this provision (Suarez 2015).

Axiak's (2018) overview continues:

> 1.3.2 Taxation treatment of FTS
>
> "The CRA takes the position that FTS is a source of property income (Fitzgerald 2012). As such, the FTS themselves are viewed as taxable property. In addition to the rules discussed above regarding the deductibility of qualifying expenses, there are also tax implications upon the disposal of FTS by way of CGT.

CGT implications for FTS

When an FTS holder disposes of FTS, the capital gain or loss is calculated in the same way as any other sale of capital property. That is, the capital gain or loss equals the capital proceeds minus the adjusted cost base and other outlays and expenses. In light of the unique properties of FTS, namely, the tax deductibility of qualifying expenses equal to the initial investment, the adjusted cost base of FTS is nil. This is because the tax deduction was claimed by the taxpayer upon the renunciation of eligible expenditures, up to the value of their initial investment.

Since the adjusted cost base is nil, investors will always realise a capital gain upon the sale of FTS.[17] The capital gain subject to CGT is reduced according to the applicable inclusion rate, presently 50%. As such, tax is paid on 50% of the realised capital gain at the taxpayer's marginal tax rate" (Axiak 2018, pp. 19-20).

Proponents of CGT concessions argue that tax benefits increase after-tax returns for investors and thus encourage investment; while critics argue that eligibility and ongoing filing requirements associated with targeted programs (such as the FTS scheme) increase the administrative burden on firms which decrease the benefits ultimately realised (Edwards & Todtenhaupt 2020). Edwards & Todtenhaupt (2020) find evidence consistent with the former perspective, indicating CGT reductions increase the value of investments in start-up firms by approximately 12% per funding round.[18]

Axiak's (2018) overview continues:

[17] By bringing forward, or accelerating, the tax deduction for the cost of the investment (rendering the adjusted cost base at the time of disposal nil), investors are encouraged to hold FTS for longer periods, in order to defer the associated tax liability.

[18] Edwards & Todtenhaupt (2020) specifically study the effect of the concessional CGT provisions introduced in the US as part of the Small Business Jobs Act of 2010 (2010 SBJA).

> "Table 1.1 provides a worked example of the investor cash flows in relation to the acquisition, disposal, and associated CGT implications of FTS, accompanied by a detailed explanation.
>
> [Insert Table 1.1]
>
> *Investment tax credits*
>
> Individual FTS investors (that is, single persons or individual members or a partnership, not corporations) may also be entitled to the mineral exploration tax credit (METC) equal to 15% of certain qualifying expenditures which are renounced to them via FTS. Introduced in 2000, this is known as the 'super flow-through share' program and allows investors to claim a 15% federal tax credit for certain 'grassroots' expenses incurred by the PBC and renounced to the FTS holder. The METC is non-refundable, meaning it only reduces the federal tax liability of the FTS holder to the extent of the tax payable, and the credit itself is then included in income the following year. The provisions allow for a carry-back period of three years and a carry-forward period of twenty years for any unused METC" (Axiak 2018, p. 20).

Provincial investment tax credits & deductions

Individual investors may also be eligible for provincial tax credits in relation to eligible expenditures incurred within provinces where such credits are available. These credits are available to individual tax residents and individuals who are otherwise taxable in the province. These are available in provinces such as Ontario (5% refundable), British Columbia (20% non-refundable), Manitoba (30% non-refundable) and Saskatchewan (10% non-refundable) (Fitzgerald 2012). While Quebec does not offer a provincial tax

credit, a 120% tax deduction is available for qualifying expenses incurred within the province (Prospectors & Developers Association of Canada 2018).[19]

Axiak's (2018) overview continues:

> *Benefits & drawbacks of FTS*
>
> "In summary, three key tax benefits are associated with investing in FTS which are inapplicable when investing in other types of SEO. These are:
>
> 1. FTS holders are entitled to a full deduction equal to the amount invested in FTS. This is claimed progressively as the PBC renounces qualifying expenditures to FTS holders.[20] These tax savings reduce the amount of the investment 'at risk'.
> 2. While FTS investors maintain their holdings, they are entitled to a 15% METC which offsets their federal tax liability. While this credit is non-refundable, if unused it can be carried back three years, and carried forward twenty years. At a provincial level, some investors may also be eligible for additional tax credits worth between 5% and 30%.
> 3. Upon disposal of FTS, investors are eligible for concessional tax treatment according to the CGT inclusion rate. As such, only 50% of the capital gain realised upon the sale of FTS is included for the purpose of calculating CGT.[21]

[19] Pierzak (2021) finds place-based tax incentives can establish conditions which inflate asset prices in the benefitting segments of the investment pool, noting such gains have the potential to hinder investment performance and attractiveness.

[20] A full deduction can be claimed immediately in the event the PBC renounces eligible expenses equal to the full amount invested in FTS at once. As such, the immediacy at which an investor can claim a deduction for the amount invested in FTS depends on the rate at which the PBC renounces eligible expenses, in accordance with the renunciation timeframe outlined in Section 1.3.1.

[21] In Canada no minimum holding period applies in order to access the concessional 50% CGT inclusion rate, which is unlike jurisdictions such as Australia.

A key drawback associated with FTS is that only the initial FTS purchaser is entitled to take advantage of the tax benefits they carry. That is, if the initial purchaser sells their FTS holdings, the subsequent purchaser cannot access the federal tax deduction for qualifying expenses renounced to the FTS holder, nor can they receive the 15% METC. Another drawback is that investments in FTS are held in escrow for a minimum of four months and up to a maximum of two years, meaning investors are unable to withdraw their funds (by way of selling their FTS holdings) for any reason.

1.3.3 Effectiveness of the FTS scheme

From the perspective of MEEs, the FTS program has raised billions of dollars for exploration projects and has contributed to the development of some of Canada's most distinguished mines, such as the Ekati and Diavik diamond properties. According to Hasselback (2013), Canadian mining firms have raised C$2.5 billion between 2008 and 2013 by implementing the FTS scheme. At the peak throughout this period, miners raised just under C$698 million from 120 FTS deals in 2011. In 2012, they raised C$563.8 million from 94 FTS deals" (Axiak 2018, pp. 21-2).

On the other hand, some disadvantages are presented to MEEs which participate in the FTS program. Firstly, ongoing administration and compliance requirements apply in order for MEEs to issue FTS and renounce eligible expenditures to FTS holders, over and above the program's use of proceeds requirements (refer Figure 1.2). Furthermore, if an FTS issuing MEE enters production in the future and thus reports project revenues, the firm has already foregone any tax deductions arising from exploration and development expenditures incurred and renounced to FTS holders. These disadvantages would not apply if MEEs elect to raise capital through other types of SEO.

Axiak's (2018) overview concludes:

> "For completeness, Figure 1.3 provides a high-level timeline of significant events in terms of the history and development of Canada's CGT and FTS systems.
>
> [Insert Figure 1.3]

An FTS scheme in Australia

Canada and Australia exhibit a number of similar economic characteristics. At a high-level, both are open economies with global trading partnerships, and are similarly ranked in terms of gross domestic product (GDP)[22] by the International Monetary Fund. Both are primarily reliant on their respective mining and agricultural sectors, and experience similar levels of inflation [23] and unemployment.[24] These similarities may increase the comparability of Canada and Australia from a policy perspective.

That said, an FTS program similar to that of Canada was a policy consideration in Australia during the early 2000s, but was discarded due to insufficient support within the government. Supporters of the proposed program viewed its implementation as an opportunity to stimulate investment in the contracting resources sector and increase the attractiveness of Australia as an investment destination. As discussed by the Chief Executive of the Minerals Council of Australia (refer Attachment 1.1), the Australian Securities Exchange attributes the migration of mining investment to Canada to the Canadian market developing 'critical mass' in the sector, where it has developed substantial expertise and

[22] Both ranked in the top 20 economies in 2017 world GDP rankings.
[23] Canada: 2.2% (Trading Economics 2018b); Australia: 1.9% (Trading Economics 2018a).
[24] Canada: 5.8% (Trading Economics 2018b); Australia: 5% (Trading Economics 2018a).

resources. The Canadian FTS program has largely supported the development of this critical mass, and if a similar program were to be introduced in Australia, might increase the competitiveness of Australia as a destination for investment in the resources sector" (Axiak 2018, pp. 22-3).

[Insert Attachment 1.1]

Since the proposed Australian FTS program, the Australian Government introduced the Exploration Development Incentive (EDI) which was effective from the 2014/15 fiscal year, and thereafter replaced by the Junior Minerals Exploration Incentive (JMEI) effective from the 2017/18 fiscal year. The EDI enabled MEEs undertaking greenfields mineral exploration within Australia to distribute exploration credits (up to an approved limit) to shareholders while foregoing a proportionate amount of their tax losses from exploration expenditure. As a result, Australian tax-resident shareholders were entitled to a refundable tax offset or additional franking credits. The JMEI functions in a similar manner, although tax credits can only be generated with respect to new shares issued in the same income year.

The Australian Government's policy rationale is detailed in an explanatory memorandum, whereby the government identifies that greenfields exploration in Australia is largely driven by junior minerals exploration companies (Parliament of the Commonwealth of Australia 2017). According to the Australian Bureau of Statistics (2017), Australian greenfields minerals exploration declined by almost 70% from A$1.2 billion in 2011/12 to approximately A$400 million in 2015/16, while greenfields metres drilled declined by almost 60% throughout the same period. Coupled with the fact it has been over twenty years since Australia reported a tier one mineral discovery, the Government has been called upon to remove the obstacles faced by MEEs in raising capital.

The ASX working capital requirements pose another issue faced by MEEs in Australia. In 2016 the ASX standardised this requirement so that all firms, including mining and oil and gas exploration companies, must have a minimum of A$1.5 million in working capital available after budgeting for the firm's revenue for the first full financial year after listing on the ASX, and in the case of explorers, the first full financial year of administration and acquisition costs. As such, MEEs must obtain more equity funding to meet this requirement, thereby raising barriers to entry and preventing some junior miners from being able to come to market.

MEEs are severely affected by the non-neutrality in the Australian tax system, whereby the system favours companies which record profits against which they can offset their deductible expenditure. Junior explorers are disadvantaged by these tax rules, as they accumulate losses which might not be offset against any taxable income for a number of years until any mineral resource is in production. MEEs face a high level of risk in terms of the likelihood of discovering a commercially viable mineral resource. As such, the high-risk profile, delays in generating profit and uncertainty around exploration success make it increasingly difficult for prospective investors to evaluate investments in junior mining firms, hindering their ability to raise capital. This leads to high levels of project failure in the sector (Ferguson, Clinch & Kean 2011), which both contributes to, and is exacerbated by, high levels of information asymmetry in the mineral exploration setting (Ferguson & Scott 2011).

By establishing provisions which allow MEEs to pass on some of their deductible expenditures to new shareholders, the Australian Government provides tax incentives to investors in junior mining firms. By encouraging investment into the sector, the JMEI program also supports the employment opportunities the industry provides, and the contribution it makes to the broader domestic economy.

1.4 Thesis objectives and research questions

The objective of this thesis is to contribute to the limited empirical evidence on FTS in Canada. This study specifically focuses on the characteristics of firms that issue FTS; the determinants of the FTS issuance premium; the share price reaction to the FTS issue announcement; and audit pricing implications for firms which issue FTS.

The key research questions which direct this thesis are:

1. What are the features of FTS deals, and characteristics of firms that issue FTS?
2. What factors determine the extent of the FTS issuance premium?
3. Does the FTS deal announcement cause a share price reaction? If so, what factors affect this reaction?
4. Are FTS issuing firms subject to higher audit fees owing to increased accounting complexity associated with FTS issuance? If so, what factors affect audit pricing?

Three main hypotheses are addressed in this thesis. Firstly, a positive association is predicted between the magnitude of the FTS issuance premium (discount) and the tax benefits associated with the FTS deal. Secondly, the share price reaction to the announcement of FTS deals is hypothesised to be greater than other SEO announcements by the same firms. Finally, MEEs which issue FTS are predicted to be subject to higher audit fees than MEEs which do not.

This study employs a sample of 5,369 FTS deals issued in Canada from 2001 to 2019. An ordinary least squares regression model is employed to quantify the determinants of the FTS premium (discount) in relation to factors recorded in the literature as impacting SEO discounting, alongside other MEE- and FTS-specific factors. Cross-sectional regression analysis is undertaken to explain the magnitude of abnormal returns by comparing the share price reactions to announcements of FTS placements to other

seasoned equity announcements by the same firms. Share price reaction is measured relative to the market return following Brown, Ferguson & Stone (2008). Audit fees are examined in relation to factors recorded in the literature as impacting audit complexity and risk, alongside other industry-specific factors. Cross-sectional regression analysis is undertaken to determine whether there is evidence of industry leader and/or service bundling premiums in the FTS context, similar to the approach taken by Ferguson, Pundrich & Raftery (2014) and DeFond, Francis & Wong (2000).

1.5 Contributions

This research has many practical implications for MEEs, investors and policymakers, and contributes to the extant academic literature. The research is important in assisting MEEs to understand FTS as a form of equity offering, particularly to identify the issue features of FTS and provide reasoning as to why FTS plans can be beneficial for both the firm and its registered shareholders. It also demonstrates the significance of FTS for the mining industry, which is a dominant industry in Canada subject to high information asymmetry. Since MEEs experience difficulty raising capital, FTS provide an opportunity to raise the necessary capital for growth and development by alleviating the agency problems associated with information asymmetry and providing tax-effective exposure to mining project upside. It also provides investors with knowledge of FTS to promote improved market efficiency.

This research is also of interest to policymakers both in Canada and abroad. Canadian policymakers benefit from this research through an increased understanding of the impact of the FTS program on capital markets, its economic significance, and how the program can be improved. International policymakers, such as those in Australia, can benefit from this research from an industry investment and implementation perspective, given their interest in boosting investment in high information asymmetry industries.

As limited academic work has been published examining FTS to date, this research contributes to the extant literature in three ways. Firstly, this thesis broadens the literature regarding security issues by providing analysis on another form of SEO (FTS). Specifically, it sheds light on the determinants of the FTS issuance premium, which generally does not conform to the pattern of SEO discounting observed amongst most types of SEOs across many jurisdictions. It also investigates factors affecting the share price reaction to the announcement of an FTS placement, thus extends the literature pertaining to market reactions to SEO announcements. Finally, this thesis extends the audit pricing literature by examining the impact of FTS issuance on audit complexity, and thus, audit fees. The TSXV exchange from which the sample is drawn has not featured in published research to date. It is also an example of a second-tier exchange which is a topical feature of the recent venture capital literature, particularly in relation to the role of such exchanges in the development of entrepreneurial public markets.

1.6 Thesis structure

This thesis is structured as follows. Chapter 2 explores the characteristics of FTS issuers and subsequently examines the determinants of the FTS issuance premium on a subsample of FTS deals. Chapter 3 addresses the share price reaction to the FTS issue announcement, and Chapter 4 examines audit pricing implications for FTS issuers.

1.7 Appendix

Table 1.1: FTS cash-flow example[25]

Assumptions		
Flow-through shares purchased		10,000
Price per FTS		$10
Mining company regular common share trading price		$9
FTS premium per share		$1
Investor's federal/provincial tax rate		46%
Investor's capital gains tax rate (assuming capital gains inclusion rate of 50%)		23%
Qualifying expenses renounced per FTS		$10
	Investor cash out	**Investor cash in**
Cost of FTS ($10/share)	$100,000	
Tax savings from $100,000 renounced expenses		$ 46,000
Investor's proceeds from selling FTS in market		$ 90,000
Tax owing on capital gain from sale of FTS	$ 20,700	
	$120,700	$136,000
Investor's positive cash flow		$ 15,300

This example demonstrates the cash inflows and outflows associated with investing in FTS from the perspective of an investor. Suppose an investor invests in 10,000 flow-through units at a price of $10/share, outlaying $100,000. Under the FTS provisions, the investor is entitled to a tax deduction up to the value of the consideration paid as and when qualifying expenditures are renounced to them by the company (within the legislated renunciation timeframe). The cash inflow to the investor associated with this tax deduction is equal to $46,000 ($100,000 investment multiplied by the 46% tax rate).

Should the investor dispose of their FTS holding, they are liable to CGT on the proceeds of the sale. Since secondary owners of FTS are not entitled to the benefits available to initial subscribers, secondary FTS do not sell at a premium, therefore this example assumes the investor can sell their FTS holding for $9/share. As such, the investor would realise proceeds of $90,000, subject to CGT. Note the FTS cost base is not deducted from the proceeds for the purpose of calculating the capital gain, since the tax deduction for the cost base is accelerated and realised upfront under FTS provisions.

Canadian CGT is applied to capital gains according to an inclusion rate of 50%. As such, only 50% of the $90,000 capital gain ($45,000) is subject to CGT. The federal/provincial tax rate of 46% is then applied to the taxable portion of the capital gain, signifying the investor is liable to $20,700 of CGT ($45,000 multiplied by 46%), representing a cash outflow.

The difference between the total cash inflows and outflows associated with the investment in FTS results in positive cash flow of $15,300 for the investor.

[25] Suarez (2015)

Figure 1.1: FTS illustration[26]

This diagram summarises the mechanics of FTS.

Firstly, investors purchase FTS from an eligible mining corporation (PBC). This represents cash flow from investors to the PBC. By proceeding to issue FTS for subscription by investors, PBCs covenant to incur qualifying expenditures equal to the value of the cash raised through the FTS issue.

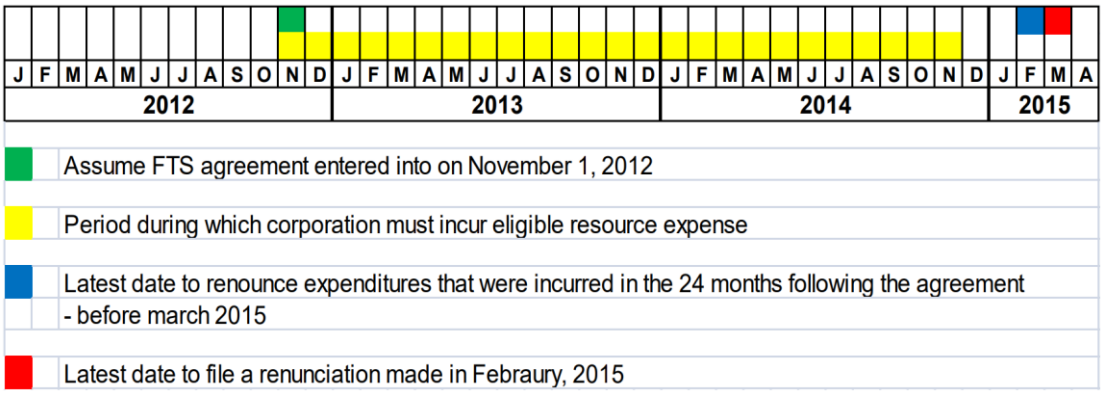
Once cash is raised through the issuance of FTS, PBCs proceed to incur qualifying expenditures. The two types of qualifying expenditures are exploration/'grassroots' expenses (CEE) and development/'pre-production' expenses (CDE). CEE are those expenses incurred to determine the existence, location, extent or quality of a mineral resource in Canada. On the other hand, CDE are those expenses which are incurred to bring a new mineral resource mine into production in Canada.

Qualifying expenditures can be renounced to FTS holders once they have been incurred, provided they are compliant with the renunciation timeline (refer Figure 1.2). Qualifying expenditures can only be renounced by PBCs up to the amount raised by way of flow-through financing.

Investors are able to claim tax deductions for the qualifying expenses renounced to them by the PBC. Qualifying expenses can only be claimed up to the amount of the initial investment made by the FTS holder into the PBC. Investors may also be eligible to take advantage of investment tax credits and deductions at the federal and provincial levels, as outlined in Section 2.2.2.

[26] Suarez (2015)

Figure 1.2: Renunciation timeline[27]



This diagram summarises the renunciation timeline which FTS issuing corporations (PBCs) must adhere to in order to ensure FTS holders can claim tax deductions for qualifying expenses.

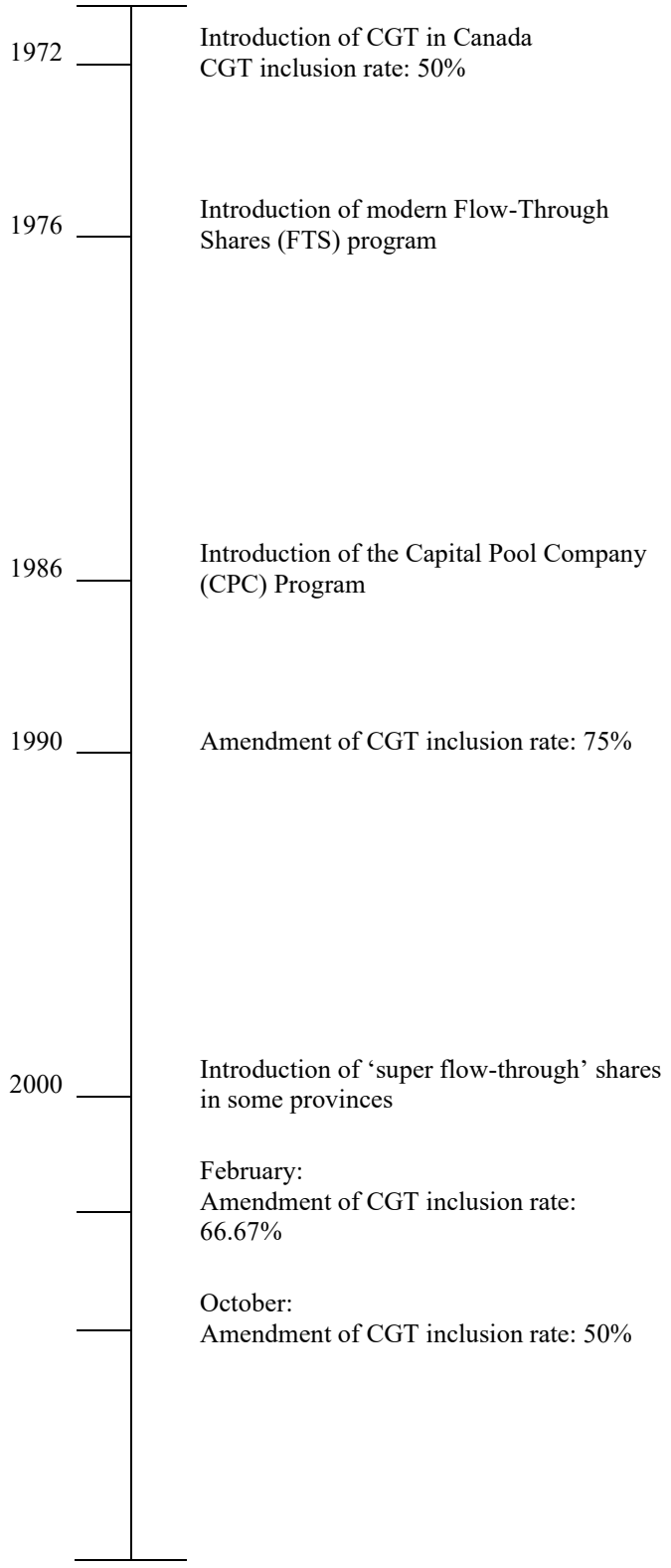
Qualifying expenditures are eligible for flow-through to FTS holders if they are incurred throughout the period commencing on the date the FTS subscription agreement is signed, until 24 months after the end of the month in which the subscription agreement is signed. With reference to the above timeline, the FTS agreement is signed on 1 November 2012 (green). As such, the PBC must incur qualifying expenditures on or after this date until 30 November 2014, to ensure they are eligible for flow-through to FTS holders (yellow).

The PBC must then officially renounce the eligible expenses to FTS holders before March of the first calendar year which begins after this 24-month period expires. In the above timeline, the PBC has until the end of February 2015 to renounce the eligible expenses to FTS holders (blue). The PBC then must work with their tax advisers to file a claim for renouncing Canadian exploration and development expenses (Form T101A) by the end of March, and lodge this with the CRA. With reference to the timeline, the PBC must lodge Form T101A with the CRA by the end of March 2015 (red). The CRA audits the forms submitted to ensure they are completed correctly and ineligible costs have not been renounced.

By ensuring compliance with this process, PBCs enable their FTS holders to claim tax deductions for renounced qualifying expenditures.

[27] Fitzgerald (2012)

Figure 1.3: Timeline relating to features of the Canadian context



Attachment 1.1: Statement in favour of introducing an Australian FTS scheme, 11 April 2006

The case for a Flow-Through Share Scheme for minerals exploration

By Mitchell Hooke, Chief Executive, Minerals Council of Australia

As a young man growing up on the land in Victoria, standing in a droughted paddock, I could not picture what a lush paddock was like. Standing in a lush paddock, I found it difficult to reconcile the ravages of drought. The irony of the current minerals boom is that the lush paddock of today masks the harsh reality of the grossly inadequate investment in minerals exploration for the discovery of future ore bodies.

There is a drought on the horizon in the minerals industry and it will be in the form of a depleted inventory of ore reserves unless there is a substantial increase in minerals exploration investment and discovery success. On today's rates of depletion and without any significant discoveries in the near term, Australia's minerals resources will be substantially depleted. It is expected that Australia will have one significant base metal mine remaining in 20 years – Olympic Dam. And gold reserves are on a 12-year time horizon.

It's not hard to see the impending drought when you consider that there is typically a period of about 10 years between initial discovery of a deposit and commencement of production.

Despite modest growth, minerals exploration expenditure is well below the levels of the mid 1990s in real terms. Internationally Australia has slipped from second to fifth behind Latin America, Canada, Africa, and the Rest of World. And, the bulk of exploration activity is "brownfields" (potential expansions of existing operations) than "greenfields" (new ore bodies). ln Western Australia, the largest resource State, exploration expenditure actually decreased in the December quarter in seasonally adjusted terms.

Though world prices have risen exponentially, there has not been the corresponding cyclical increase in minerals exploration expenditure – pointing to underlying structural disincentives to invest. For the economists among you, this is not "market myopia", this is "market failure". The poor state of Australia's exploration expenditure is more a function of a range of structural impediments and distortions facing junior exploration companies in raising capital, than it is the market's inability to recognise the benefits of exploration.

Specifically, the market failures are tax related impediments to junior exploration companies, and the "crowding out" effects of Government policies and programs designed to assist aspects of the small venture capital market, unsuited to junior explorers.

The MCA and other parts of the resources industry have strongly advocated a suite of fiscal measures to redress these "market failures", central to which is the introduction of a Flow-Through Share Scheme and increased funding for precompetitive geoscientific mapping. A Flow-Through Share Scheme, comparable to that operating in Canada, would enable the transfer of tax deductions of individual exploration companies to individual investors. ln this, the tax deduction of the exploration expenditure is leveraged in the capital markets in the subject year, attracting external investors rather than being accumulated as tax losses, which will only be realisable when the company earns a taxable income.

The Federal Government is again considering the resources industry's flow-through share proposal, which is carefully constructed for effectiveness and integrity measures.

Failure to correct the structural impediments puts Australia at a competitive disadvantage. We are a less attractive investment destination than other countries, which are just as prospectively resource rich. The independent Fraser Institute, based in Canada, assesses how public policy factors such as taxation and regulation affect exploration investment of mining companies around the world. Of the 64 jurisdictions surveyed, in terms of relative attractiveness, the best Australian State was Western Australia ranked 11th, with the other Australian States/Territories ranking between 12th and 30th.

Data sourced from the Australian Stock Exchange (ASX) clearly indicates that IPOs (Initial Public Offerings) and secondary raisings of capital of mining companies are increasingly migrating to Canada. Since Canada introduced a Flow-Through Share Scheme there has been an exponential growth in Canada's equity financings. The Toronto Stock Exchange Group is home to 60 per cent of the world's public mining companies and Canada has the world's largest mining analyst community that covers both issuers on both Toronto Stock Exchange and TSX Venture Exchange. These Exchanges have become the world's leading markets for raising equity capital for mining.

The ASX attributes this migration to what they call the "network effects" of equity markets – which is another way of saying the Canadian market has developed critical mass and is now a major centre of expertise and resources. ASX suggests that the Flow-Through Share Scheme in Canada was a major building block in the development of Canada's critical mass, and has resulted in an "un-level playing field" between Canada's capital market and Australia's. Once this network effect develops, buyers and sellers flock to the market, which offers greater scale, higher liquidity and lower cost of capital, and the whole process is a self-reinforcing cycle. Once entrenched it is nigh impossible to reverse.

The national interest case is strong. The resources industry is making a significant contribution to Australia's economic prosperity. We must avoid the trap of living off the fat of the land in the good times and not reinvesting some of that prosperity for continued and sustained wealth generation.

It's pretty easy politics to dismiss the industry's case as looking for incentives in "boom times". But that's not the honesty of it. The argument is not about incentives, it's about removing disincentives. And as many a successful farmer will tell you - prepare for drought in the good times – make hay while the sun shines.

2.0 DETERMINANTS OF THE FLOW-THROUGH SHARE ISSUANCE PREMIUM

2.1 Introduction

This chapter contains an exploratory study of the determinants of the flow-through share (FTS) issuance premium. The chapter is structured as follows. The background literature in Section 2.2 discusses theories regarding firm financing decisions, discounting of seasoned equity offerings and investor home bias. The literature pertaining to private investment in public equities, tax shelters and implicit taxes is also outlined. The hypothesis to be tested is detailed in Section 2.3. Section 2.4 provides descriptive statistics for the sample of 5,369 FTS deals issued between 2001 and 2019 with respect to their issue features. Section 2.5 discusses the research design, including the ordinary least squares (OLS) regression model and variable measurement. Results are discussed in Section 2.6 and Section 2.7 concludes.

2.1.1 Motivation

Limited academic work has been published examining FTS to date. Empirical evidence is limited to studies of how efficient FTS are as a mechanism for delivering income tax deductions to issuing firms and the cost effectiveness for both issuers and investors (Jenkins 1990; Jog 2016; Jog, Lenjosek & McKenzie 1996).[28] The objective of this chapter is to investigate the determinants of the FTS issuance premium. As can be seen in Table 2.3, the majority of FTS deals captured in the sample are issued at a premium. Anecdotal and empirical sources suggest issuance premiums are generally observed

[28] Jenkins (1990) suggests that the tax revenues foregone in enabling the FTS program outweigh the net benefits obtained by the FTS issuer. On the other hand, Jog, Lenjosek & McKenzie (1996) argue FTS can be cost effective for issuers and are similarly effective to other equity-based financings (such as retained earnings and common shares). Jog (2016) suggests that while FTS carry tax benefits for investors and have encouraged exploration activity, they do not generate 'reasonable and positive' rates of return for investors (p. 18).

across the broader population of FTS deals (Jog 2016; Prospectors & Developers Association of Canada 2016).

Several factors motivate this study. Firstly, the issuance of FTS is becoming increasingly widespread amongst eligible firms. As demonstrated in Table 2.1, the number of FTS deals increased by 505% between 2001 and 2019 on the TSX Venture Exchange (TSXV) alone. The FTS program has raised C$4.5 billion for junior exploration firms between 2011 and 2018, accounting for over 65% of funds raised on Canadian stock exchanges for exploration purposes. FTS account for almost 30% of the total number of common share issues on the Toronto Stock Exchange (TSX) and TSXV between 2007 and 2012 (Department of Finance Canada 2013).

The firms eligible to issue FTS include junior mineral mining and resource exploration companies. These are broadly categorised in the literature as mineral exploration entities (MEEs). Similar to biotechnology research and development (R&D) firms, MEEs are characterised by long project life cycles, high levels of information asymmetry and high risk profiles (Ferguson & Lam 2021). To quantify the probability of exploration success, Bartrop & Guj (2009) estimate there is a 0.9% chance of discovering an economically viable orebody in a greenfield exploration project, a 0.3% chance of discovering a major orebody and 0.07% chance of discovering a world-class orebody. The high levels of risk and slim likelihood of success leads to substantial project failure rates amongst MEEs (Ferguson, Clinch & Kean 2011), which is intensified by high levels of information asymmetry in the setting (Bui, Ferguson & Lam 2021; Ferguson & Lam 2021; Ferguson & Scott 2011). The FTS scheme was introduced by the Canadian Government and represents a means of de-risking, and subsequently incentivising investment into, the high-risk MEE sector. While private investors are interested in financial returns, governments are largely interested in the

generation of positive externalities (Bai et al. 2022). MEEs represent the potential generation of significant positive externalities through higher tax revenues, employment opportunities and other benefits to adjunct industries, in the event a mining exploration project is successful. Thus, the Canadian Government effectively co-invests in mining projects where FTS deals are used for capital raising.

FTS are a type of seasoned equity offering (SEO) which exhibit unique properties by carrying tax benefits typically unavailable to investors through other types of SEO. The tax benefits afforded to the initial purchaser of FTS include: a tax deduction for the amount of qualifying expenditures renounced by the firm up to the amount invested by the FTS holder; a 15% federal tax credit for certain 'grassroots' expenses incurred and renounced to the FTS holder (eligible to be carried forward and back);[29] provincial tax credits of varying rates (depending on location);[30] and concessional capital gains tax treatment upon disposal of the FTS. The provision of these benefits to investors is based on the assumption that tax deductions arising from exploration and development expenditures incurred by MEEs are more valuable to FTS holders than the corporation itself (Fitzgerald 2012), since MEEs have little to no income against which to offset these expenses for tax purposes.

The benefits grant investors the opportunity to own equity in MEEs at a subsidised rate through favourable policy arrangements, enabling tax-effective exposure to mining project upside while providing a degree of downside protection. This approach makes investment more affordable for private parties without exposing the Canadian Government to downside risk and jeopardising public resources. The assurance role played by the Canadian Government mitigates the moral hazard problem inherent in

[29] Available to individual investors only (that is, single persons or individual members or a partnership, not corporations).
[30] Available to individual tax-resident investors in specific Canadian provinces only.

high information asymmetry environments (Gompers 1995). This represents an example of government intervention in facilitating the function of a private market as a means of mitigating information asymmetry in agency relationships between shareholders and management, as discussed by Pratt & Zeckhauser (1985). Given the unique properties and economic significance of FTS in the Canadian context which is largely comprised of high-risk MEEs, empirical research to examine the determinants of the FTS issuance premium is warranted.

2.1.2 Contribution

Since FTS are a type of SEO, they represent a form of equity financing for eligible MEEs. The financing decisions literature is extensive, covering different models and determinants likely to explain and impact the financing choices of firms. Furthermore, literature pertaining to the discounting of SEOs and the factors driving such discounts (premiums) is relevant to this chapter. As published academic work investigating FTS is limited, this chapter contributes to the extant SEO discounting literature by examining a relatively new type of SEO to understand the determinants of firms issuing equity at a premium (or discount) within the FTS context.

This chapter also draws upon, and contributes to, the investor home bias literature (Lindblom, Mavruk & Sjogren 2018). This is primarily due to the fact MEEs are only eligible to issue FTS to finance Canadian exploration projects. Moreover, the provincial tax credits which are available as one of the tax benefits associated with FTS can only be accessed by tax-resident individual investors within the Canadian province where the exploration project is located. This institutional feature of the FTS program provides a novel setting to examine the investor home bias reported in other contexts and jurisdictions.

This chapter also contributes to the taxation literature, specifically tax shelters and implicit taxes. Tax shelters create tax savings by "repackaging ownership rights amongst investors" (Shackelford & Shevlin 2001, p. 340). FTS issuing firms represent a tax-sheltered form of investment as they reallocate exploration and development expenditures to FTS holders. On the other hand, 'implicit taxes' refers to the phenomenon whereby taxes are capitalised into prices, while the price of comparable investments are lower given future taxes on those assets (Maydew 2001). This is relevant to the FTS program because FTS are generally issued at a premium on account of the tax benefits they carry.

The sample of FTS deals utilised in this thesis is drawn from companies listed on the TSXV, which is a second-tier exchange specifically designed for microcap venture firms too small to list on the TSX.[31] The composition of the TSXV has a mining firm focus (approximately 68%). As such, the sample utilised in this thesis represents a homogenous group of microcap MEEs drawn from the TSXV exchange which has not featured in published research to date. Further, this chapter has relevance to policy-makers, practitioners and academics seeking a better understanding of the FTS program

[31] Microcap second-tier exchanges feature less restrictive listing requirements in an effort to promote the creation and retention of employment-creating new ventures (Bernstein, Dev & Lerner 2020). According to the conceptual framework in Bernstein, Dev & Lerner (2020), stock exchanges provide a certification and monitoring role through listing and disclosure requirements which mitigate concerns of investor expropriation. Such listing requirements and disclosure rules present barriers for venture firms which tend to be unprofitable for many years, and possess intangible capital not captured in exchange listing eligibility tests based on book value of assets or shareholders' equity. Thus, second-tier exchanges have been established to accommodate high-growth entrepreneurial firms. Bernstein, Dev & Lerner (2020) find jurisdictions with better shareholder protection (as measured by the World Bank Doing Business database) encourage an environment where junior, unprofitable but fast-growing firms can list on second-tier exchanges and raise more capital. Such protection mitigates the risk of investor expropriation. Applying this framework to FTS issued by MEEs listed on the TSXV, Canada scores between 80 and 90 out of 100 between 2006 and 2020 in shareholder protection according to the World Bank Doing Business database. This score implies shareholder protections are strong in Canada, indicating investors are more willing to provide capital to high-risk MEEs listed on second-tier exchanges. Furthermore, the TSXV exchange (from which the sample of FTS deals is drawn) is an example of a second-tier exchange. It recently updated its listing requirements (in 2023) to make it easier for MEEs with adequate working capital and property interests, and a sufficient work program, to list on the exchange (TMX Group 2023a).

in relation to the issue features of FTS deals, and factors driving the FTS issuance premium.

2.2. Background literature

2.2.1 Financing decisions of firms

The corporate finance literature is dominated by two models which attempt to explain the financing decisions of firms, namely, the trade-off model and the pecking order model. Both views explain a number of general patterns observed in capital structures, such as the relationship between leverage and different firm characteristics, although neither explains much of the heterogeneity observed in capital structure, leverage levels or security issuance decisions (Graham & Leary 2011).

2.2.1.1 Trade-off model

The trade-off model posits that a firm will determine its capital structure based on a trade-off between the marginal costs and benefits of debt. The firm moves its capital structure towards an optimum, which is achieved when the marginal costs of debt just offset the marginal benefits, and thereby firm value is maximised (Jensen 1986). The marginal costs of debt include costs of possible financial distress (Myers 2001), potential bankruptcy costs (Kim 1978; Kraus & Litzenberger 1973), and agency conflicts between stockholders and bondholders (Jensen & Meckling 1976; Myers 1977). On the other hand, the marginal benefits of debt include the tax deductibility of interest payments (Fama & French 2005), non-debt tax shields (DeAngelo & Masulis 1980) and reduction of free cash flow agency problems (Jensen 1986).

The literature provides mixed support for the trade-off model. For example, the model suggests leverage and profitability are negatively related, however this appears to be inconsistent with expectations since more profitable firms should place more value on

the tax shield benefits of debt (Graham & Leary 2011). Further, many US firms are found to have low (or zero) debt, while exhibiting large tax liabilities and low distress risk (Graham 2000). From an empirical perspective, the capital structure model of Bradley, Jarrell & Kim (1984) incorporates positive personal taxes on equity and bond income, anticipated costs of financial distress and positive debt tax shields. Their results demonstrate that earnings volatility, intensity of R&D and advertising expenditure are inverse determinants of firm leverage levels if costs of financial distress are significant. These findings are consistent with the trade-off model. On the other hand, their results also suggest a direct relation exists between firm leverage levels and the amount of non-debt tax shields, which is contrary to the trade-off theory. Huang & Song (2006) find the capital structures of Chinese firms typically exhibit features of the trade-off model, given that leverage increases with firm size, effective tax rate and fixed assets and decreases with profitability, non-debt tax shields and growth opportunities. However, these findings could also be attributed to factors unique to the Chinese setting, such as the infancy of the debt market and banks being one of the few sources of external debt. With regard to the mean reversion of debt ratios, some studies report statistically significant mean reversion parameters (Auerbach 1985; Jalilvand & Harris 1984), while others suggest that the rate debt ratios revert to the respective target ratio is much slower (Baker & Wurgler 2002; Fama & French 2002; Welch 2004).

2.2.1.2 Pecking order model

The pecking order model suggests that firms exhibit a pecking order when considering the means with which to finance new investments; that is, first with internal equity (namely, retained earnings), then public debt (through the issuance of debt securities), then private debt (by way of external debt, such as borrowings from banks), and finally, external equity (through the issuance of stock). First posited by Donaldson (1961), the

model provides an alternative explanation of firm capital structure which was further developed by Myers (1984) and Myers & Majluf (1984). The pecking order model is based on the underlying premise that asymmetric information problems drive firm capital structure. As discussed by Myers & Majluf (1984), when managers possess superior information regarding a prospective project or investment and proceed to issue stock to finance the investment, the stock price typically falls, causing investment disincentive. Therefore, the costs of issuing risky securities give rise to the pecking order. Since debt is not subject to the same risk of misevaluation as equity, it is the preferred source of external funding. Unlike the trade-off theory, firms do not have a specific leverage target, but rather aim to maintain an unutilised debt capacity.

There is inconsistent empirical evidence in relation to the role of asymmetric information in a firm's financing decisions, and therefore inconsistent evidence supporting the pecking order theory. The first testable prediction of the pecking order model was developed by Shyam-Sunder & Myers (1999) using a small sample of mature companies. They regress net debt issues on the financing deficit and find that firms do in fact plan to finance anticipated deficits with debt, therefore debt finance is not unanticipated. However, they qualify their findings and suggest the pecking order would be as applicable for a sample of growth companies. Frank & Goyal (2003) extend the sample period to 1998 and remove the restriction on firms to report continuously over the period (thereby increasing the sample size). The results do not provide support for the pecking order theory in the larger sample, particularly during the 1990s, where net equity issues track the financing deficit more accurately than net debt issues. They also find that smaller and younger firms do not follow the pecking order, meeting their financing deficits largely with equity. Bui, Ferguson & Lam (2021) also observe this for MEEs. Similarly, Fama & French (2005) find high growth microcap firms

frequently issue equity. On the other hand, Lemmon & Zender (2010) suggest these findings are not necessarily inconsistent with pecking order theory, after including variables to capture the firm's debt capacity and desire to create financial slack for given costs of financial distress. This is because high growth firms may have debt capacity constraints, and pecking order theory may be most relevant for firms with a low value of growth opportunities relative to assets in place, as demonstrated by Myers & Majluf (1984). However, Leary & Roberts (2010) find that even in samples of firms where the pecking order theory is expected to hold, it seldom predicts issuance decisions correctly.

The literature provides evidence on the ways firms use external finance. Myers (2001) shows only a small proportion of capital is obtained externally when internal cash flows are insufficient to fund capital expenditures, and most of this external funding comprises debt. However, Fama & French (2002, 2005) find that firms of all sizes issue equity frequently, contradicting Myers (1984) and Myers & Majluf (1984). Frank & Goyal (2008) demonstrate that firms which share similar characteristics have similar financing practices. They find private firms make heavy use of retained earnings and bank debt; small public firms actively issue equity; and large public firms utilise retained earnings and corporate bonds.

Small firms in particular are found to support a partial version of the pecking order theory. Most unprofitable but fast-growing microcap firms are found to make net equity issues each year, and such issues are on average, larger than their new net issues of debt (Fama & French 2005; Frank & Goyal 2003). Risky microcap firms issue equity in public and private markets, but are more likely to make private placements[32] to reduce the impact of information asymmetry and adverse selection problems (Gomes &

[32] This assertion is consistent with the descriptive statistics pertaining to the sample studied in this thesis. The majority of FTS deals issued by MEEs are made via private placement.

Phillips 2012). These capital structure patterns call into question the role of asymmetric information in security issuance and the findings of Shyam-Sunder & Myers (1999), who examine large firms (Fama & French 2005; Frank & Goyal 2003).

Fama & French (2002) posit that asymmetric information problems are not the sole determinant of firm capital structure. In support of this view, Helwege & Liang (1996) find asymmetric information does not influence the choice between whether firms issue public equity, private debt or public bonds. On the other hand, others find evidence on the impact of asymmetric information on security issuances. For example, Gomes & Phillips (2012) find that the probability of issuing public equity declines with asymmetric information, but increases for public debt. Meanwhile in the private market, measures of asymmetric information are associated with a decrease the probability of issuing debt and an increase in the probability of issuing equity (Gomes & Phillips 2012; Hertzel & Smith 1993). These findings suggest that asymmetric information gives rise to a conditional pecking order, where the order of security issuance holds when issuing in the public market. A reversal of the pecking order is seen in the private market, where firms with higher levels of information asymmetry are more likely to issue equity.

2.2.2 Determinants of financing decisions

The trade-off and pecking order theories have formed the basis of research seeking to address the determinants of firm capital structure. In order to explain the determinants of variation in firm debt ratios, Taub (1975) and Titman & Wessels (1988) collectively examine nine attributes which determine capital structure, including, asset structure, non-debt tax shields (or tax rate), growth, uniqueness, industry classification, size, earnings volatility, profitability and the firm's period of solvency. Chiarella et al. (1992) examine similar determinants in the Australian context, including the level of firm cash holdings as an additional explanatory variable.

Marsh (1982) employs a descriptive choice model between equity and long-term debt. The determinants examined include firm size, risk, asset composition and short-term timing considerations like equity and bond market conditions. Gomes & Phillips (2012) study private and public issues of debt, convertibles and equity, and also include risk and corporate governance measures in their model.

Antoniou, Guney & Paudyal (2008) study the drivers of capital structure in the UK, US, France, Germany and Japan, which are argued to demonstrate different financial systems and traditions. That is, the UK and the US are market-oriented economies, whereas France, Germany and Japan are bank-oriented economies. The study employs a model of the leverage ratio as dependent on firm-specific characteristics (profitability, growth opportunities, tangible assets, effective tax rate, firm size, earnings volatility and dividend payout ratio), and market-related variables (market equity premium, term structure of interest rates, share price performance and mergers and acquisitions activity). The results indicate that capital structure decisions are impacted by firm-specific characteristics, market conditions and the legal and financial traditions within the country in which the firm operates. On the other hand, Rajan & Zingales (1995) find that firm leverage is similar across G7 countries at an aggregate level.

Little research has examined the determinants of the varying types of equity issues. Lee & Kocher (2001) examine the characteristics of firms that issue private placements in comparison with those that issue public offerings. In doing so, the study analyses six determinant factors, including firm size, dividends, growth opportunities, free cash flow, overvaluation and managerial ownership fraction. Chu, Lentz & Robak (2005) compare the characteristics and performance of firms which issue equity privately and firms which issue seasoned equity. They measure firm characteristics using financial ratios of operating performance, including operating income to total assets, net profit margin,

gross profit margin and return on assets. Burton & Power (2003) investigate the choice between the issuance of rights and private placements. The study examines seven attributes, including firm size, growth opportunities, liquidity, profitability, dividend behaviour, offer method of the most recent equity issue and shareholder structure. Dewa & Ibrahim (2009) specifically examine factors driving the decision to issue equity via private placement in the Malaysian setting, such as free cash flow, asymmetric information, managerial ownership fraction and firm size.

2.2.2.1 Firm size

Prior research posits that firm size is an inverse proxy for the likelihood of bankruptcy (Rajan & Zingales 1995), given that larger firms are typically more mature and diversified, therefore less exposed to bankruptcy risk. As such, it would be reasonable to expect that larger firms are likely to have a higher debt capacity, and could be expected to borrow more in order to maximise the associated tax benefits. Leverage is demonstrated to be positively associated with firm size (Antoniou, Guney & Paudyal 2008; Chiarella et al. 1992; Frank & Goyal 2009; Taub 1975), and small firms are more likely to issue equity (Fama & French 2005; Frank & Goyal 2003; Marsh 1982) and short-term debt in comparison to long-term debt (Titman & Wessels 1988). Firms which issue private placements are also smaller than firms which make public equity issues (Dewa & Ibrahim 2009; Lee & Kocher 2001).

From an information asymmetry perspective, the degree of asymmetry between owners and managers is negatively related to firm size. The probability of issuing public equity declines with the degree of asymmetric information, while it increases for public debt (Gomes & Phillips 2012). On the other hand, the probability of issuing private equity increases slightly with the degree of asymmetric information (Dewa & Ibrahim 2009; Gomes & Phillips 2012). Overall, the probability of firms issuing private securities

compared to public securities is positively related to measures of asymmetric information (Gomes & Phillips 2012), which is negatively related to firm size. This would suggest the high information asymmetry setting of MEEs are more likely to issue private equity since they are relatively small.

2.2.2.2 Growth and investment opportunities

Growth and investment opportunities are found to have a negative relationship with firm debt levels (Antoniou, Guney & Paudyal 2008; Frank & Goyal 2009; Huang & Song 2006; Titman & Wessels 1988). Where firms exhibit a higher level of investment opportunities, they are more likely to issue equity and convertibles (Gomes & Phillips 2012). Furthermore, firms which issue private placements are found to have more growth opportunities than those which issue public offerings (Lee & Kocher 2001). With respect to microcap firms, those with higher risk and investment opportunities are more likely to issue equity than debt in both public and private markets (Gomes & Phillips 2012). Simultaneously, these firms are also more likely to issue privately.

2.2.2.3 Liquidity

The pecking order theory suggests firm preference for the use of internal funds, namely retained earnings, as a means of financing future investments. As such, a negative relationship is expected between leverage and liquidity. Dewa & Ibrahim (2009) find a negative and significant relationship between free cash flow and the choice to issue equity by way of a private placement. This is consistent with pecking order theory in that the absence of free cash means firms cannot draw upon internal funds or convince lenders to extend loans, and are therefore forced to raise equity.

Different types of equity issues exhibit varying features, such as the time taken to conduct the issue and other requirements, such as shareholder and/or stock exchange

approval. A positive relationship is predicted between firm liquidity and the ease and efficiency of the issuance method. Burton & Power (2003) suggest a rights issue can be conducted more quickly than if a firm were to issue a private placement, however, the results indicate liquidity is not a key factor in the decision between the two types of equity issue.

2.2.2.4 Profitability

Since the pecking order theory states that firms prefer to fund future investments with retained earnings, a firm's level of profitability ought to be an important determinant of its capital structure as an internal capital source is generated. A negative relationship is predicted between leverage (and equity issuance) and prior profitability, since according to the pecking order, a firm must not have retained earnings available if it resorts to debt or equity financing.

Prior literature evidences a negative relationship between leverage ratios and firm profitability (Antoniou, Guney & Paudyal 2008; Chiarella et al. 1992; Frank & Goyal 2009; Huang & Song 2006; Rajan & Zingales 1995; Titman & Wessels 1988). Where firms exhibit low profitability, Gomes & Phillips (2012) find they are more likely to choose equity or convertibles, or issue a private placement. The findings of Hertzel & Smith (1993), Lee & Kocher (2001) and Chu, Lentz & Robak (2005) are consistent with this, in that firms with low profitability (and therefore a greater need for external funding) prefer private placements in contrast to public offerings. Where unprofitable, loss-making firms are fast-growing, they are found to make net equity issues each year (Fama & French 2005). This also applies to microcap firms, who are found to issue more equity in both public and private markets despite their lower profitability (Gomes & Phillips 2012).

2.2.2.5 Cash holdings

Following the pecking order theory, the level of firm cash holdings is a measure of internal capital available for investment financing, therefore leverage is predicted to be inversely related to the amount of firm cash holdings. On the contrary, the free cash flow argument posited by Jensen (1986) suggests the debt to equity composition of a firm is an effective bonding mechanism so that leverage is positively associated with the level of cash holdings. Chiarella et al. (1992) find a positive (but insignificant) relation between cash holdings and debt ratios, providing some support for the free cash flow hypothesis.

2.2.2.6 Leverage

Studies which assess firm financing decisions have employed a measure of leverage as the dependent variable (Antoniou, Guney & Paudyal 2008; Titman & Wessels 1988) in exploring a firm's financing decisions. As studies which assess the characteristics of various equity issues have not considered leverage, no relationship is predicted.

2.2.2.7 Dividend behaviour

Firms which distribute dividends may need to seek external capital more frequently than non-dividend paying firms, on the basis that dividends are paid from (therefore reduce) the firm's retained earnings balance. In this case, they may experience monitoring activities by external parties. Distributing dividends may also reduce the free cash flow problem, therefore mitigating the agency problems experienced by non-dividend paying firms. As such, the arrangement of private placements as an alternative monitoring mechanism is less important among firms which distribute dividends, thus giving rise to a negative relationship (Lee & Kocher 2001). Frank & Goyal (2009) also find firms paying dividends have less leverage than non-payers.

2.2.3 Discounting of seasoned equity offerings

A number of studies attempt to explain the determinants of discounts (and premiums) observed in SEOs. For example, Eckbo, Masulis & Norli (2007) summarise this literature.

Underpricing of SEO offers has been observed since the 1960s, where Eckbo & Masulis (1992) found offer prices were underpriced by an average of 0.44% while studying a sample of NYSE and AMEX listed firms between 1963 and 1981. Subsequently, Altinkilic & Hansen (2003) and Corwin (2003) investigate NYSE and Nasdaq listed firms and find underpricing increases further in the 1980s and 1990s respectively. Specifically, underpricing averaged 1.3% in the 1980s and 2.92% in the 1990s, suggesting discounts could be partially driven by the increase in the number of young issuing-firms with asset bases mostly comprising risky intellectual property and growth options (Corwin 2003).

Some studies investigate whether SEO underpricing results from price pressure or a downward sloping demand curve, recording mixed results as to whether a downward sloping demand curve effect, short-lived price pressure effect or adverse information effect is present. For example, Loderer, Sheehan & Kadlec (1994) report temporary stock price declines in the months subsequent to an SEO. Corwin (2003) finds SEO discounts are positively associated to the relative offer size and interprets this as indicative of a price pressure effect. Meanwhile, Meidan (2005) notes significant negative returns immediately before an SEO, and significant positive returns immediately after, which also supports a price pressure effect. Similarly, Altinkilic & Hansen (2003) find a negative return of -2.6% in the week prior to an SEO, which is followed by a small positive return the week following.

More recently, Melia, Docherty & Easton (2020) study the choice between alternative SEO issuance methods in the Australian setting, specifically rights issues and private placements. They conjecture that greater discounts contribute to the issue being fully subscribed, due to the effect of the discount and the dilution effect associated with shareholders not participating in the SEO. They suggest this contrasts with a private placement which can be completed quickly, and subsequently, at a lower discount. Therefore, they expect a negative relationship between the discount and the firm's propensity to choose a private placement issuance. The results confirm this hypothesis, suggesting that as discounts increase in magnitude, firms are more likely to choose a rights issue. This result is consistent with Armitage (2000) who argues large discounts are used as a tool to sell difficult offers.

Bobenhausen, Breuer & Salzmann (2020) study the determinants of discounts in equity rights issues across a variety of jurisdictions. They find firms with greater uncertainty regarding firm value usually grant larger discounts, and that there is a negative association between discounts and the level of uncertainty avoidance in the jurisdiction. They also show uncertainty avoidance becomes stronger for lower levels of investor protection within the specific country. These findings are similar to the prior literature. For example, Corwin (2003) finds SEO discounts are positively associated to the level of uncertainty about firm value. Meanwhile, Altinkilic & Hansen (2003) find a positive relationship between discounts and stock volatility, as do Kim & Shin (2004) and Kim & Park (2005). Heinkel & Schwartz (1986) also find large discounts transmit a negative signal about firm quality, whereby high quality firms can set lower discounts because their risk of failure is limited in comparison to low quality firms. Furthermore, and of particular relevance to this FTS research, the descriptive findings of Bobenhausen, Breuer & Salzmann (2020) suggest Canada has one of the highest average discounts on

rights offers (62.07% across all industries compared to 33.32% worldwide); while the mining industry also has the largest mean discount (45.11% worldwide). The magnitude of this discount is indicative of the information asymmetry problems present in the mining sector.

Armitage, Dionysiou & Gonzalez (2014) investigate large discounts in SEOs in the UK setting, the average of which is 22.9%. They find the key determinants of a discount are inelastic demand (or the illiquidity of company shares) and financial distress. These results add to the body of evidence that it remains difficult and expensive for small-cap firms (such as those which issue FTS) to raise equity, even if the company is listed on a stock exchange.

Similarly, Asem et al. (2016) test whether SEO discounts are impacted by stock liquidity and investor sentiment in Australia between 2002 and 2008. Firstly, consistent with Chemmanur & Jiao (2011), they find information asymmetry has a positive relationship with discounts, however this is not impacted by changing investor sentiment. When investor sentiment deteriorates, the increase in discounts for firms with illiquid shares is greater than the corresponding increase for firms with liquid shares. This suggests that as investor sentiment reduces, investors become more concerned about illiquidity, thus demanding greater compensation for holding illiquid assets by way of discounts.

Intintoli & Kahle (2010) study the effect of insider ownership of the firm on SEO discounts based on a US sample of firms which issued SEOs between 1980 and 2004. The results indicate higher insider ownership (therefore a reduced float), increases pricing pressure and underpricing, and this is demonstrated most amongst firms with low liquidity. They further suggest the larger the relative size of the SEO, the lower the level of underpricing, indicating managers may pressure investment banks to reduce

underpricing when their personal wealth is at stake. This is seen to be mitigated when the firm employs a prestigious underwriter.

2.2.4 Investor home bias

Investor home bias refers to the preference of the average investor to establish a domestic portfolio of firms within geographical proximity (Lindblom, Mavruk & Sjogren 2018). This is observed amongst both individual (Grinblatt & Keloharju 2001; Lindblom, Mavruk & Sjogren 2018; Massa & Simonov 2006; Seasholes & Zhu 2010) and professional investors (Baik, Kang & Kim 2010; Cooper, Sercu & Vanpee 2013; Coval & Moskowitz 1999; French & Poterba 1991; Hamberg, Mavruk & Sjogren 2013; Hau 2001; Kang & Stulz 1997; Lewis 1999; Tesar & Werner 1995). The literature documents two main explanations which attempt to explain this bias, namely the information hypothesis and the familiarity hypothesis. Neither hypothesis completely explains equity home bias, therefore the portfolio decisions made by investors are likely driven by a mixture of factors (Ardalan 2019).

The information hypothesis posits that in instances where information asymmetry is present, local investors receive value-relevant information regarding firms within geographic proximity before non-local investors. Such information is acquired through sources including social networks, inside information or information leakage (Korniotis & Kumar 2013; Seyhun 1986). Given their understanding and knowledge of the institutional setting, local investors may also have a comparative advantage in disseminating information about locally proximate firms (Grinblatt, Keloharju & Linnainmaa 2011, 2012). Consistent with the information hypothesis, a number of studies evidence investors which exhibit a local bias in their portfolios earn positive abnormal returns (Coval & Moskowitz 2001; Feng & Seasholes 2004; Ivkovic, Sialm & Weisbenner 2008; Ivkovic & Weisbenner 2005), including post-IFRS adoption,

which reduces information processing costs for investors and uncertainty about financial reporting quality (Beneish & Yohn 2008).

In contrast, the familiarity hypothesis suggests investor preferences are driven by cultural, psychological and/or emotional factors. Some such factors include a common language, sentiments of belonging, over-confidence, investor hubris (Bailey, Kumar & Ng 2008, 2011; Barber & Odean 2000; Grinblatt & Keloharju 2001; Huberman 2001; Korniotis & Kumar 2013; Odean 1998), and feelings of a close connection to the locality (Baltzer, Stolper & Walter 2015). Lindblom, Mavruk & Sjogren (2018, p. 324) describe this kind of proximity bias as being *"driven by the heart, rather than by the brain"*.

Other recent literature indicates proximity bias extends beyond portfolios which are biased towards geographically proximate stocks. One such example is observed by Pool, Stoffman & Yonker (2012), who note professional investors responsible for managing mutual funds, on average, overweight stocks of firms who have headquarters located in their home state,[33] even when they are living elsewhere. A birthplace bias, which captures the extent to which native investors select firms which have headquarters located in their area of birth to be included in their portfolio, is identified by Lindblom, Mavruk & Sjogren (2018) who study a Swedish sample. They find individual investors who live in their birthplace invest, on average, three times more portfolio capital into local firms, compared to other locals. This bias appears to be neither informationally nor behaviourally driven, persists after moving elsewhere, and increases significantly for investors returning home. McQueen & Stenkrona (2012) also study a Swedish sample and document a home-institution bias,[34] which is a preference for domestic

[33] In this case, home state is defined as the location where the investor first received a social security number (which is not necessarily their place of birth).
[34] This is distinct from the home-asset bias.

financial institutions. The results suggest individuals have a preference to deal with what is familiar to them, and that this phenomenon is not driven by information asymmetry.

Contrary to these results, Graham, Harvey & Huang (2009) and Karlsson & Norden (2007) find investors with higher levels of competence are less likely to tilt their portfolios in a manner which exhibits home bias, and are more likely to shift a proportion of their assets abroad. This is supported by Chen et al. (2009), who find foreign investors in Taiwan (who have access to the same public information set as local investors) capitalise on such information to earn large positive abnormal returns. Meanwhile, domestic investors forego such returns, thus suggesting foreign investors are more sophisticated (or confident) than domestic investors in being able to interpret the same public information.

In another study, Baltzer, Stolper & Walter (2015) investigate whether familiarity stimulated by ambiguity aversion can offer any explanation to the local bias observed amongst individual investors. They find investors withdraw from remote stocks which they are less familiar with, and invest more capital into familiar local stocks at times of market uncertainty.[35] They rule out local investors having a home field advantage to conclude local bias is driven by attempts to avert ambiguity in the portfolio selection process, rather than investors adopting a trading strategy based on superior information about local firms.

Mohlmann (2013) conducts an investment experiment to study whether sentiment about the country benefitting from tax revenues impacts tax behaviour and investment decisions, on the premise that the willingness of individuals to pay taxes depends on

[35] This is known as the 'flight to familiarity' effect.

the characteristics of the tax-collecting government (Slemrod 2007). Prior studies find the characteristics which increase the willingness to pay taxes include: approvement of public expenditures, attitudes towards government, rights of political participation, government decentralisation, perceived military threat, institutional quality, trust in authority and spending efficiency. Furthermore, Morse & Shive (2011) find investors from relatively patriotic countries (or more patriotic states within the US) exhibit home bias to a greater extent. Mohlmann's results suggest investors are reluctant to hold foreign equity where tax is levied by a foreign tax collector, indicating that tax factors play a role in explaining international portfolio decisions. While investors demonstrate such preferences, it would be reasonable to expect tax authorities to adopt a similar approach; that is, offering tax benefits to tax-paying parties only, as in the case of FTS.

2.2.5 Private investment in public equities

Private investment in public equities (PIPEs) have become a popular means of follow-on equity financing which exceed SEOs by number and dollar amount in the US setting (Chen, Dai & Schatzberg 2010). PIPEs are typically issued by junior and small firms which exhibit high levels of information asymmetry while having high potential for growth and volatile stock returns (Barclay, Holderness & Sheehan 2007; Chaplinsky & Haushalter 2010; Gomes & Phillips 2012). Given these firm characteristics, which are identical to those of FTS issuers, such firms are limited in their ability to raise equity capital, and therefore PIPEs represent a final resort. It is important to note, however, that PIPEs differ to standard private placements of equity because PIPEs can be resold in public markets as soon as the issuing firm legally registers the shares (Anson 2001). Therefore, PIPEs are more liquid than private placements, which in jurisdictions like Canada are subject to a minimum holding period (usually of four months but can vary). While FTS tend to be issued via private placement (rather than PIPEs), the PIPEs

literature is reviewed nonetheless due to the common characteristics amongst PIPEs and FTS issuers, which can shed light on the motives of such firms choosing private methods of equity issuance rather than public.

The literature suggests potential motives for firms to issue PIPEs. The issuing firm could be experiencing financial constraints (Haggard, Zhang & Ma 2009) or require funding for R&D projects and working capital (Floros & Sapp 2012); PIPEs might be employed by entrenched managers as a defence against takeovers (Dann & DeAngelo 1988) or purchased by investors intending to monitor management performance and promote efficient usage of firms assets (Wruck 1989); or investment in PIPEs may provide certification for firm quality and prospects (Hertzel & Smith 1993).

Haggard, Zhang & Ma (2009) conduct a descriptive study of PIPE deals across international markets of Canada, Australia, Hong Kong and the UK, to determine whether there are any similarities with PIPE deals in the US market. They find that like PIPEs issued in the US, PIPEs issued on five of the six exchanges examined account for a larger portion of new public equity issuances than standard SEOs. They note that industries which dominate the PIPE market also vary by country and region. For example, in resource-rich countries such as Canada, the PIPE market is dominated by firms in the basic materials and energy sector (that is, MEEs). Interestingly, Canadian PIPEs are issued at a premium compared to the firm's share price, similar to many FTS deals. These results are consistent with those of Carpentier, L'Her & Suret (2005), who examine the Canadian PIPEs market between 1993 and 2003. By the end of the sample period studied, PIPEs exceed the number of SEO issues and Canadian PIPE-issuing firms are largely members of the mining sector.

Chen, Dai & Schatzberg (2010) examine the choice of firms between issuing an SEO or PIPE using a US sample spanning 1996 to 2006. They find the PIPEs market meets

the capital needs of firms which might not have access to more traditional methods, due to their inherent characteristics of high information asymmetry and poor operating performance. Firms are also more likely to opt for PIPEs when the both the market in general and the specific firm's stocks are performing poorly. They also note firms with access to the public market might still prefer to employ PIPEs for cost reasons.

Floros, Nagarajan & Sivaramakrishnan (2020) study the certification role of insiders who participate in PIPE deals amongst a sample of US PIPE transactions. They find insider participation is mainly determined by board seats and weak pre-PIPE performance, and evidence the certification motive for insider participation in PIPE deals, noting it is associated with lower PIPE discounts and improved future operational performance. They also find that, on average, investors pay more to participate in PIPE deals which involve insiders than those which do not, and that insider participation in such transactions can mitigate moral hazard issues.

2.2.6 Tax shelters

Tax shelters create tax savings by "repackaging ownership rights amongst investors" (Shackelford & Shevlin 2001, p. 340).[36] Flow-through entities represent a tax-sheltered form of investment as they reallocate exploration and development expenditures to FTS holders. Despite their tax effectiveness, tax shelters can attract agency costs such as under-completion, which describes projects that are abandoned prematurely ahead of their optimal completion. This occurs because of an incentive problem arising from the optimisation of tax rules, since different parties in an investment arrangement can be subject to varying tax implications (Wolfson 1985).

[36] Taxpayers are very responsive to legislation promoting tax-sheltered investments which impact their after-tax investment opportunities and would find them even more attractive if not for agency concerns and the inability to monitor the managers appointed as agents to manage such investments (Wolfson 1985).

Wolfson (1985) studies the US tax-sheltered oil and gas industry and demonstrates that the tax-minimising drilling arrangement (conducted via limited partnerships) induces the under-completion problem. This is because, from a tax perspective, the value of a limited partnership interest is maximised in instances where limited partners fund the initial drilling operations, which can be immediately deducted for tax purposes. If the drilling proves successful, the general partner completes the extraction process (the cost of which is not immediately deductible). Thus, the tax system encourages limited partners to invest before general partners (Shackelford & Shevlin 2001). Where the drilling is unsuccessful, the well is abandoned. The under-completion problem arises because only the general partner knows the status of the drilled hole, and as they are responsible for the extraction and completion costs (while only receiving a partial share of the resulting revenue), they are incentivised to abandon the well unless it is profitable to them individually (not the partnership as a whole).

Shevlin (1987) examines the decision to conduct research and development (R&D) in-house or through a limited partnership. R&D limited partnerships allow low marginal tax rate firms (such as start-ups) to transfer (or sell) tax benefits to individuals with a higher marginal tax rate (the limited partners), who can immediately utilise the tax deduction. Similar to the FTS program, this arrangement is motivated by the fact that tax deductions are more valuable to high(er) marginal tax rate individuals than junior firms with little to no income against which to offset their expenditures.

In more recent times, a new and more complex form of corporate tax shelter has been developed in the form of flow-through entities. Edwards & Shevlin (2011) provide empirical evidence suggesting investors value the tax benefits of a flow-through entity

in an integrated corporate tax system.[37] By examining whether income trust units are tax-favoured to non-resident and pension plan investors who cannot take advantage of dividend tax credits available in Canada,[38] they find significantly negative abnormal returns following the imposition of entity-level income taxes for income trusts in 2006.

Understanding corporate tax shelters, particularly flow-through entities, is of policy and scholarly interest (Shackelford & Shevlin 2001). However, little research has been conducted in this area due to data limitations.

2.2.7 Implicit taxes

'Implicit taxes' or 'tax capitalisation' refers to the phenomenon whereby tax-favoured assets yield lower pre-tax returns than assets which are not tax-favoured (Maydew 2001). Taxes are capitalised into prices, while the price of comparable investments are lower given future taxes on those assets (Maydew 2001). This is relevant to the FTS program because FTS are generally issued at a premium on account of the tax benefits they carry.

Dai et al. (2008) test the impact of capital gains taxes on equity trading through the (demand-side) capitalisation effect and (supply-side) lock-in effect. The capitalisation effect is based on the premise that investors demand lower asset prices since they are required to pay capital gains taxes at a future date. On the other hand, the lock-in effect suggests investors require higher prices to sell assets if taxes are payable by them as a result of the transaction. Using a sample of weekly returns and trading volumes from 1995-1997, they find the capitalisation effect dominates the lock-in effect during the

[37] An integrated tax system (such as Canada) entitles resident shareholders to receive a tax credit for corporate taxes paid by the entity, which they can use to offset personal income taxes on dividend income. The FTS program provides similar benefits comparable to imputation credits in Australia, because they allow investors to receive tax credits for expenses already incurred by the company.

[38] Non-resident and tax-exempt investors (such as pension plan recipients) who cannot utilise the tax credit therefore prefer to invest in flow-through entities (Edwards & Shevlin 2011).

time between the news of a capital gains tax rate reduction and the effective date of the reduction. During the week after the rate reduction takes effect, the lock-in effect is observed to dominate the capitalisation effect.

Shackelford (1991) examines the interest rates of leveraged employee stock ownership plans (ESOP). Tax laws exclude half the interest income on ESOP loans received by the lender from income tax. Two interest rates are provided in the loan agreement: one assumes the exclusion is available to the lender, and the other assumes the loan's interest is fully taxable. The two interest rates are for the same loan, provided by the same lender, to the same borrower, over the same period. They only differ in their tax treatment, much like FTS common stock as opposed to non-FTS common stock. The implicit tax concept would suggest the same after-tax return would apply to the lender for both interest rates. Shackelford finds the after-tax rates are similar, and approximately 75% of the tax benefits from the exclusion are passed through to the borrower in the form of lower interest rates.

In another study, Erickson & Maydew (1998) report a proposed decrease in the dividends-received deduction (which would increase the dividend taxes paid by corporate investors), resulted in a price reduction for preferred shares, but not common shares. They conclude corporations that benefit from the dividends-received deduction are the marginal investor for preferred shares, while a corporation not affected by the deduction is the marginal investor for common shares. This suggests the implicit taxes related to the corporate dividends-received deduction are greater for preferred shares than for common shares.

2.3 Hypothesis

Limited prior research has been conducted on FTS. FTS represent a unique equity offering exhibiting features of different equity offerings. FTS are mostly issued via private placement (92% of deals within the sample are issued via private placement).

A model is developed to identify the determinants of the FTS issuance premium. A priori, it would be reasonable to anticipate that FTS issuance premiums act as a mechanism to price the tax benefits afforded to investors who purchase FTS. Prior SEO discounting research also considers other explanations for SEO discounts (premiums), including stock liquidity, demand elasticity, information asymmetry and financial distress (Armitage, Dionysiou & Gonzalez 2014; Bobenhausen, Breuer & Salzmann 2020; Corwin 2003; Kim & Shin 2004; Mola & Loughran 2004). Given the characteristics of the MEEs which issue FTS, it would be reasonable to expect a level of stock illiquidity to be present due to the highly asymmetrical MEE information environment and the constraints on their financial resources.

The tax benefits afforded to the initial purchaser of FTS include: a tax deduction for the amount of qualifying expenditures renounced by the firm up to the amount invested by the FTS holder; a 15% federal tax credit for certain 'grassroots' expenses incurred and renounced to the FTS holder (eligible to be carried forward and back); provincial tax credits of varying rates (depending on location and tax status); and concessional capital gains tax treatment upon disposal of the FTS.

According to the implicit taxes literature, 'implicit taxes' or 'tax capitalisation' refers to the phenomenon whereby tax-favoured assets yield lower pre-tax returns than assets which are not tax-favoured (Maydew 2001). Taxes are capitalised into prices, while the price of comparable investments are lower given future taxes on those assets (Maydew 2001). Since FTS are an example of a tax-favoured asset, the implicit taxes literature

would suggest that these benefits are capitalised into the FTS issue price. Therefore, the extent of the FTS issuance premium should be determined (at least partially) by the extent of the tax benefits associated with the FTS deal.

The extent of the tax benefits associated with an FTS deal vary depending on the location of the mineral project, since provincial tax credits only apply where the project benefitting from FTS funding is located in a province which offers provincial tax credits (and the individual FTS investor is a tax-resident of that province).[39] According to the investor home bias literature, the average investor prefers to establish a portfolio of firms within their geographical proximity (Lindblom, Mavruk & Sjogren 2018). Applying this to the FTS context, FTS investors are likely to purchase FTS issued by firms with mineral projects located in the province where they are a tax resident. Furthermore, if such investors are tax-resident of British Columbia, Manitoba, Ontario, Saskatchewan or Quebec, they are eligible to apply the provincial tax credits (or deductions) available in those jurisdictions.

Based on this reasoning, FTS issuance premiums, and the cross-sectional variation in premiums, can be at least partially attributed to the pricing of tax benefits associated with the FTS deal. Thus, H1 is expressed as follows:

H1: *There is a positive association between the magnitude of the FTS issuance premium (discount) and the tax benefits associated with the FTS deal*

2.4 Sample of FTS deals

2.4.1 Data and sample identification

The FTS sample utilised in this thesis covers all FTS deals issued on the TSXV between 2001 to 2019 (inclusive).[40] The sample has been identified through the triangulation of

[39] These provinces include British Columbia, Manitoba, Ontario, Saskatchewan and Quebec, at the rates stipulated at Section 1.3.2.

[40] The TSXV supports some unique entities known as capital pool companies (CPCs), which are shell companies without assets or commercial operations formed by a group of experienced corporate officers

three data sources, including firm financial statements, S&P Capital IQ and Factiva. To obtain the data, searches were conducted firstly in the 'Share Capital' section of firm financial statements, secondly in the 'Transactions' section of the S&P Capital IQ database, and finally, amongst TSXV market announcements recorded in Factiva between 2001 and 2019. This data collection process yields a sample of 5,369 completed FTS deals issued by 808 firms between 2001 and 2019.

Other data required for this chapter is obtained from three sources. Firm financial data, including share price data and shareholder structure, is sourced from the S&P Capital IQ database. Firm mineral project data (including commodity focus) and Canadian exploration expenditure data are sourced from the firm financial statements obtained from the SEDAR database. Commodity price data is obtained from the International Monetary Fund time series dataset.

2.4.2 Issue features

The remainder of this section outlines descriptive statistics pertaining to FTS issue characteristics. Table 2.1 provides an annual breakdown of the number of FTS deals and the number of FTS issuers from 2001 to 2019,[41] and Figure 2.1 demonstrates the trend in FTS issues over the period. Table 2.2 breaks down annual FTS deals by sub-industry groups.

[Insert Table 2.1]

[Insert Table 2.2]

and directors (TMX Group 2023b). These entities are entitled to a two-step public-offering process to enable small firms to access capital markets, and ultimately can trade on the TSXV like regular listings once management acquires a growing business and undertakes a reverse takeover of the CPC shell company (known as the 'Qualifying Transaction'). CPCs cannot issue FTS as they are not MEEs, thus are not within the scope of the sample.

[41] Year is based on the completion date of the FTS deal.

Firstly, it is observed that the number of FTS deals steadily increases until 2007, at which point the number of deals dips then recovers by 2010. This trend could be attributed to the Global Financial Crisis (GFC) of 2008. After 2010, the number of FTS deals steeply declines until 2013, after which they generally increase until 2019. This corresponds with the decrease and subsequent increase of commodity prices. The number of issuers can be observed to follow a similar pattern to the number of deals. Firms in the Diversified Metals & Mining and Gold sub-industries are most active in issuing FTS deals across the sample period.

[Insert Figure 2.1]

The steady increase in FTS deals observed between 2001 and 2007 is consistent with Ndubuzor, Johnson & Pavel (2009), who note the introduction of super flow-through shares (and the associated investment tax credits) in 2000 has resulted in increased investor activity, and is demonstrated by way of the increase in exploration expenditures by mining entities in Canada. Aggregate Canadian exploration expenditure has increased from approximately C$300 million in the late 1990s to an estimated C$1.722 billion by 2006 (Ndubuzor, Johnson & Pavel 2009), and reached C$2.3 billion in 2018 (Natural Resources Canada 2019).

The continued prevalence of FTS financing despite the steep decline observed between 2010 and 2013 is supported by survey responses collected from members of the Prospectors & Developers Association of Canada (2016). Members noted three key reasons for raising funds using FTS, namely: ‘investor preference’, in that investors prefer FTS as a means of mitigating investment risk and/or the associated tax benefits they receive; ‘availability’, as issuing FTS is easier than raising hard dollars and/or the

only means of capital available to finance exploration;[42] and 'premium', as FTS can be issued at a premium due to the tax benefits they carry, therefore firms can raise more funding per share and increase their exploration budget.

Secondly, a substantial number of firms made more than one FTS deal over the period, and many also made multiple FTS deals in a given year. Specifically, 612 firms issued more than one FTS deal across the sample period and, on average, firms made 6.6 deals throughout this period. For example, Arctic Star Exploration Corp. issued the most FTS deals (35), followed by Klondike Gold Corp. (33). This is illustrated in Figure 2.2.

[Insert Figure 2.2]

On average, firms issued 1.6 FTS deals per year, with Carube Copper Inc. issuing the largest number of FTS deals in a given year (14 deals in 2010), followed by GTA Resources and Mining Inc. (9 FTS deals in 2017). This is illustrated in Figure 2.3.

[Insert Figure 2.3]

Figure 2.4 shows the number of FTS announcements by month from 2001 to 2019 (where the month can be identified). Reviewing FTS announcement dates on a monthly basis reveals the highest frequency of FTS announcements occur in December (1,062), accounting for 23% of all FTS announcements. The lowest frequency of FTS announcements occurs in January (150). Observation of Figure 2.4 suggests there could be two FTS announcement cycles throughout the calendar year. A gradual increase in FTS announcements can be identified between January and June (that is, the first cycle). A subsequent increase can be identified from July to December, where a notably steep increase can be identified from September to year-end (that is, the second cycle). These

[42] 92% of FTS deals are private placements. This supports the findings of Brown, Gallery & Goei (2006) who find private placements are an appealing means of fund raising as they allow companies to obtain funding relatively quickly at a lower cost.

findings suggest FTS issuing firms are less likely to make an announcement in January or February, but gradually build up to a small mid-year peak. They also suggest FTS issuers aim to make the bulk of their announcements in the lead up to the calendar year-end. This seasonality is consistent with FTS issuers taking advantage of the 'look-back' rule (refer Section 1.3.1).

[Insert Figure 2.4]

In terms of deal completions, Figure 2.5 shows the number of FTS issues by month throughout the sample period (where the month can be identified). Analysis of FTS issue dates on a monthly basis reveals the highest frequency of FTS issuances occur in November (446) and December (1,522). These months combined account for 39% of all FTS issues. The months with the lowest number of FTS issues are February, March and April. Each of these accounts for an average of 4.7% of FTS issues. The remaining months each account for an average of 6.8% of FTS issues. Consistent with the abovementioned monthly announcement observations, these results suggest FTS issuing firms aim to complete FTS deals which have already been announced before the calendar year-end.

[Insert Figure 2.5]

Figure 2.6 combines Figures 2.4 and 2.5, and displays FTS announcements alongside FTS issues (deal completions) for each month. As mentioned above, the bulk of announcements and issues each year occur in November and December, suggesting FTS issuing firms aim to finalise deals before year-end. Seasonality in FTS issues occurs close to the Canadian financial year-end (that is, 31 December), which may suggest FTS issuers attempt to make use of the 'look-back' rule which enables investors to obtain an immediate tax deduction for renounced expenses in the same financial year.

Interestingly, this seasonality occurs around the same time tax-loss selling activity is observed on the TSXV and other exchanges (Badrinath & Lewellen 1991; Brown, Ferguson & Sherry 2010). Once the escrow period lapses[43] investors are free to sell their FTS holdings, at which point they will realise a capital gain. As such, it is plausible that investors may engage in tax-loss selling to offset capital gains realised upon the sale of FTS.

It also appears the announcements which occur in the later months of the calendar year may spill over into January if they are not finalised before year-end. After this active turn-of-year period, February is the slowest month for FTS issues.

[Insert Figure 2.6]

2.4.2 Issue features and characteristics

Descriptive statistics for qualitative and quantitative issue features of FTS deals are presented in Table 2.3. The qualitative characteristics of FTS issues examined include: issue format, director participation, broker participation and underwriter participation. Tables 2.4 and 2.5 present sensitivity analyses examining these characteristics by sub-industry and size quartiles (measured by firm total assets). On the other hand, the quantitative characteristics of FTS issues examined include: issue price, different measures of issue size and the time to issue from announcement.

[Insert Table 2.3]

2.4.2.1 Issue format

Table 2.3 shows an overwhelming 91.8% of FTS deals are issued via private placement. The remainder are issued via public offering. Private placements are employed as a low

[43] The escrow period lapses between four months and two years from the date of FTS issue.

cost alternative to issue equity to reduce the impact of information asymmetry and adverse selection problems (Gomes & Phillips 2012), and potentially reduce the time to issue. This result is consistent with Gomes & Phillips (2012), who find risky microcap companies are more likely to make private placements than issue equity in public markets.

2.4.2.2 Participating parties

Other parties participating in FTS deals are directors, brokers and underwriters. Of the FTS deals included in the sample, directors participated in 28.5%, [44] brokers participated in 7.5% and underwriters participated in 1.6%. Participation of company directors in an equity issue is often considered a positive signal about the future prospects of the firm (Datar, Feltham & Hughes 1991; Leland & Pyle 1977; Mehran 1995). The relatively low levels of broker and underwriter participation in FTS deals may be attributed to the high incidence of private placements which work to reduce the impact of information asymmetry and adverse selection problems (Gomes & Phillips 2012). Furthermore, since the Canadian Government effectively co-invests in FTS issues through the provision of attractive tax benefits, there is little need for parties such as brokers and underwriters to partake.

2.4.2.3 Issue price

The mean (median) FTS offer price is C$0.31 (C$0.18) per share. Partitioning the sample into sub-samples of public offerings and private placements, the mean offer price for public deals is C$0.40, while only C$0.31 for private placements. Often FTS

[44] Director participation is subject to measurement error as it includes both direct and indirect interests.

are issued at a premium on account of the tax benefits they carry,[45] however, this is not a regulatory requirement.[46] Both the mean and median premium for FTS issues are 11%.

It is interesting to consider the FTS issue price premium in light of the Hertzel & Smith (1993) argument that discounts represent the cost of the equity issue to the firm. That is, firms with high information asymmetry (such as MEEs) pass on larger discounts since the firms are more costly to evaluate. FTS issues are mostly conducted by way of private placements, which work to mitigate information asymmetry and adverse selection issues (Gomes & Phillips 2012) and carry lower issue costs. Despite this and arguments posited by Hertzel & Smith (1993), FTS are still generally issued at a premium, reflecting the significant tax benefits they provide.

2.4.2.4 Issue size

The mean (median) issue size of FTS deals is C$953,200 (C$378,190), and 278% (16%) as a proportion of shares outstanding prior to issue.[47] This suggests some firms use FTS to undertake substantial expansions of their equity base.

The largest issue raised C$28,000,000, while the smallest issue raised only C$400. As per Table 2.4, the Iron Ore sub-industry raised the largest amount per FTS deal (on average), while Silver firms raised the lowest amount. Unsurprisingly, the amount raised steadily grows with firm size (refer Table 2.5).

[45] Tax-favoured investments generally have higher prices than comparable investments which are not tax-favoured. This is because taxes are capitalised into prices, while the price of comparable investments are lower given future taxes on those assets (Maydew 2001). This is known as 'tax capitalisation' or 'implicit taxes'.

[46] According to the Prospectors & Developers Association of Canada (2016), 65% of FTS financing deals carry some type of premium, while 26% of financings had no associated premiums and 9% were issued at a discount.

[47] The Canada Business Corporations Act states at section 53b: "a company's notice of articles must set out, for each class and series of shares, the maximum number of the shares of that class or series of shares that the company is authorised to issue, or state that there is no maximum number". Caps do not apply unless established by the company itself.

[Insert Table 2.4]

[Insert Table 2.5]

As a proportion of outstanding shares, the mean (median) issue size is 278% (16%). The issue size of public FTS deals is 348% (19.1%), while private deals is 273% (15.7%). These results suggest that while public FTS deals only comprise a fraction of all FTS deals in the sample, on average, they tend to be larger in terms of the number of units offered. Firms in the Gold sub-industry issued the greatest proportion of FTS relative to shares outstanding, while firms in the Coal & Consumable Fuels segment issued the smallest proportion (refer Table 2.4). The issue size is demonstrated to have an inverse relationship with firm size; specifically, the smallest firms issue the greatest proportion of FTS relative to outstanding shares, and this gradually decreases as firms grow in size (refer Table 2.5).

The mean (median) issue size relative to market capitalisation prior to issue is 11% (6%). Again, partitioning by public and private deals, the mean (median) for public deals is 9% (5%) of market capitalisation. In contrast, the mean (median) for private placements is 11.3% (5.9%). This shows the dollar amount raised in private placements relative to market capitalisation is greater than that of public offerings. These results suggest that while public offerings generally issue a larger quantity of shares, private placements issue FTS at a higher price, thereby making up a greater proportion of market capitalisation. An inverse relationship is also identified with firm size; namely, smaller firms issue FTS deals which comprise a larger proportion of their market capitalisation, while large firms make smaller issues (refer Table 2.5).

2.4.2.5 Time to issue

Time efficiency is measured as the number of days between the FTS announcement and issue date, and is seen to vary across the sample. The mean (median) days taken are 31.16 (21.5), with the longest time to market being 652 days. An interesting observation is that in some cases, the FTS issue date is recorded on the same day as the announcement date. This occurred for 648 deals and reflects the nature of FTS deals, in that they are designed to be a low cost and a less regulated means of raising capital for junior miners. Altogether 812 issues recorded a time to market within three days of announcement. Firms in the Coal & Consumable Fuels segment generally issue FTS deals the fastest (24.75 days on average),[48] which could reflect their issuances comprising the smallest proportion of their outstanding shares (noted above, refer Table 2.4). Time to issue is noted to decrease as firm size increases (refer Table 2.5), which could be due to greater investor confidence in larger firms due to lower information asymmetry and reduced risk, consequently closing deals faster.

If firm size is considered a proxy for information asymmetry, it appears to be driving the monotonic variations in the FTS issue characteristics documented in Table 2.5. Due to lower information asymmetry, larger firms (those in Quartile 4) are able to issue FTS at a higher premium. Despite issuing the smallest amount of shares, they are able to raise the most equity due to a higher issue price. Lower information asymmetry also enables these firms to minimise their time to issue, meaning they complete FTS deals faster.

2.4.3 Firm characteristics

Table 2.6 reports the characteristics of FTS issuing firms. The mean (median) age of FTS issuing firms is 17.02 (13) years, and the mean (median) size is C$16.24 (C$15.47)

[48] Table 2.4 shows the Integrated Oil & Gas segment has an average time to issue of zero days. While this is the lowest of all industry segments, only one FTS issuer is classified in this segment.

and C$15.86 (C$15.10) in terms of the measures employed for market capitalisation and total assets respectively. Before the natural logarithm is taken, market capitalisation (*MC*) has a mean (median) of C$11.3 million (C$5.2 million), while total assets (*TA*) has a mean (median) of C$7.74 million (C$3.6 million). These results are consistent with the expected characteristics of TSXV microcap MEE constituents.

[Insert Table 2.6]

Firm growth opportunities are measured using *BVE / MVE* (book value of equity less convertible equity scaled by market value of equity) and *Capex / TA* (capital expenditure scaled by total assets). The mean (median) *BVE / MVE* is 0.89 (0.50), indicating the market factors in some growth potential for these stocks.[49] The value of *CapEx / TA* indicates the same, in that FTS issuers expand and/or improve their asset base, on average, by 18% annually.

Liquidity is captured using the *Current ratio* (current assets divided by current liabilities). The mean (median) *Current ratio* for the sample of FTS issuers is 6.97 (2.58), indicating firms are generally in a position to meet their current liabilities.

Profitability is measured using *FCF / TA* (net cash from operations less net cash from investing activities less total dividends paid out less repayment of borrowings scaled by total assets) and *EBITDA / TA* (earnings before interest and tax less depreciation and amortisation scaled by total assets). Both *FCF / TA* and *EBITDA / TA* suggest FTS issuing firms are unprofitable, with a mean (median) of -0.32 (0.00) and -0.97 (-0.22) respectively. This is consistent with the nature of the sample firms, as MEEs are known to be loss-making prior to the production of a mineral resource (if this ever eventuates). This aligns with the rationale of the FTS program, where MEEs have little or no income

[49] A high book-to-market ratio implies a firm is undervalued.

against which to offset their exploration expenses (therefore, are unprofitable), hence renounce such expenses to FTS holders who utilise them against their own income. Furthermore, under the FTS program, MEEs are required to expense (rather than capitalise) all of their capital expenditure, resulting in larger losses.

Cash holdings are captured using *Cash burn* (calculated as cash in the current period less cash in the prior period scaled by total assets), and *Cash / TA* (calculated as cash scaled by total assets). The mean (median) *Cash burn* result of -0.03 (0.00) suggests FTS issuers use more cash than they receive or held in the prior year. Cash comprises, on average, 22% of an FTS issuer's total assets.

Two measures of leverage are taken: *TD / TA* is measured as book value of total debt scaled by total assets, while *TD / (TD + MVE)* is measured as book value of total debt divided by the book value of total debt plus the market value of equity. The median values for both *TD / TA* and *TD / (TD + MVE)* suggest the majority of the sample of FTS issuers are without debt. This is consistent with the pecking order theory given MEEs have little to no retained earnings and are mostly unable to obtain debt, hence turn to equity. Interestingly, the minimum and maximum values are reported at both extremities meaning some firms are highly leveraged while others are not at all.[50]

A number of indicator variables capture the discovery of resources and reserves, and the commodity focus of the FTS issuers. On average, 46% of FTS deals were issued by firms reporting 'measured and indicated' and/or 'inferred' resources (*Resource*) prior to the FTS announcement date. Meanwhile, an average of 5% of FTS deals were issued by firms reporting 'proven' and/or 'probable' reserves (*Reserve*). Roughly half of the

[50] Given the nature of MEEs, there is a low likelihood of their ability to obtain debt from external lenders such as banks. From inspection of firm financial statements, any leverage present in the firm capital structure is mostly attributed to loans from related parties such as directors, seed loans for feasibility completions, or bridge loans for project acquisitions (Ferguson & Lam 2021).

FTS issuers (mean: 0.51 or 51%) have a commodity focus in the precious metals/gemstones sector (*Precious*), followed by 15% in the base metals sector (*Base*).

Shareholder structure (*ShStructure*) is measured by scaling the number of shares held in free float by total shares outstanding. *ShStructure* has a mean (median) of 0.76 (0.81), implying the general public or retail investors hold approximately three quarters of the total shares issued by FTS issuers (rather than insiders and institutional investors).

In terms of governance characteristics, FTS issuers have a mean (median) of 5.28 (5) directors on the board (*Board size*), of which an average of 27% are independent (*Board independence*).

Since FTS represent a type of common equity issue, measures have also been taken to capture the proportion FTS comprise of firms' total common equity issuances. Two measures are employed in this respect: one in terms of the number of FTS deals compared to total common equity deals (including FTS and non-FTS deals), and the other in dollar terms. FTS issues represent an average of 36% (median: 0.33) of common equity deals conducted by FTS issuing firms, while accounting for an average of 34% (median: 0.17) of the funds raised from common equity issues.

A summary of all descriptive variable measurements can be found at Attachment 2.1.

2.5 Research design

This chapter of the thesis attempts to identify the factors which determine the extent of the FTS issuance premium. Specifically, it attempts to determine whether the FTS premium acts as a mechanism to price the tax benefits afforded to participating investors.

Table 2.7 provides a reconciliation of FTS deals subject to the premium determinants analysis. The sample is reduced to 1,070 deals as 1,921 deals are without a dependent variable, and data for one or more explanatory variables is unavailable for 2,378 deals. Specifically, firm-year data pertaining to exploration and evaluation assets (including location and primary commodity data) reported in relation to Canadian mineral properties is hand-collected from the firm financial statements. Due to time constraints, such data could only be collected with respect to 20% of the FTS deal sample.

[Insert Table 2.7]

An OLS regression model is employed to quantify the determinants of the FTS premium (discount), and the model is specified as follows:

$$\begin{aligned} DiscPrem = {} & b_0 + b_1 ShStructure + b_2 BC + b_3 MN + b_4 ON + b_5 SK + b_6 QC \\ & + b_7 ExplorExp + b_8 PrCount + b_9 FirmSize + b_{10} Prec \\ & + b_{11} Base + b_{12} Bulk + b_{13} Divers + b_{14} CommPrice \\ & + b_{15} AccumLoss + b_{16} InfoAsymm + b_{17} DemElast + b_{18} RunUp \\ & + b_{19} Year\ fixed\ effects + e \end{aligned}$$

Variable measurement is as follows:[51]

A continuous dependent variable (*DiscPrem*) is employed to capture the extent of the FTS premium (discount). It is calculated by dividing the FTS issue price by the average closing price prevailing on the five days prior to the FTS announcement, minus 1. The explanatory variables proxy for the FTS premium as a pricing mechanism of the tax benefits available to investors. Shareholder structure (*ShStructure*) is measured by scaling the number of shares held in free float by total shares outstanding.[52] As noted

[51] Continuous variables are winsorised at the 2% level, and the results are not sensitive to winsorisation at the 1% and 3% levels.
[52] Intintoli & Kahle (2010) also control for insider ownership/float.

in Section 1.3.2, individual investors are entitled to additional tax benefits which institutional investors are ineligible for. A series of project location binary variables (*BC*; *MN*; *ON*; *SK*; and *QC*) are also employed to capture the location of the firm's mineral properties. Each is coded =1 if the firm has a mineral property located in British Columbia, Manitoba, Ontario, Saskatchewan and/or Quebec respectively; zero otherwise. As noted in Section 1.3.2, these specific provinces offer individual tax resident investors additional tax credits (at varying rates) over and above the full tax deduction equivalent to the amount invested, but only if the FTS deal raises funds for a project within that province. All explanatory variables are measured at the most recent balance date before the FTS announcement.

Two variables are employed to control for firm prospectivity, which might also influence whether firms issue FTS at a premium. The first is Canadian exploration expenditure (*ExplorExp*), which is the firm's total exploration expenditure across all Canadian mineral exploration projects. The other is the firm's project count (*PrCount*), which is captured as the natural logarithm of the total number of Canadian projects.

Firm size (*FirmSize*) is measured as the natural logarithm of total assets. A series of commodity binary variables (*Prec*; *Base*; *Bulk*; and *Divers*) are employed to control for the firm's commodity focus. Each is coded =1 if the firm's commodity focus is precious metals/gemstones, base metals, bulk metals, and diversified respectively; zero otherwise. Following Bui, Ferguson & Lam (2021) commodity prices (*CommPrice*) are controlled by taking the annualised standard deviation of the monthly commodity prices of the firm's focus commodity. Accumulated losses (*AccumLoss*) are calculated as the natural logarithm of carry-forward losses.

Following prior SEO discounting literature, other potential drivers of SEO underpricing are also controlled for. Information asymmetry (*InfoAsymm*) is measured as the book

value of equity less convertible equity scaled by market value of equity (Armitage, Dionysiou & Gonzalez 2014).[53] Demand elasticity/price pressure (*DemElast*) is measured as the number of FTS offered divided by ordinary shares outstanding at the month-end prior to FTS issue (Armitage, Dionysiou & Gonzalez 2014; Corwin 2003; Kim & Shin 2004).[54] Share price run up (*RunUp*) is calculated as the cumulative share price return over the last 60 trading days before the FTS announcement.[55]

All control variables are measured at the most recent balance date before the FTS announcement, with the exception of *DemElast* and *RunUp* which are FTS deal-specific.

A summary of all variable measurements can be found at Attachment 2.2.

2.6 Results

2.6.1 Descriptive results

Table 2.8 reports *DiscPrem* by sub-industry, partitioning FTS issued at a discount and FTS issued at a premium respectively. Firstly, consistent with anecdotal evidence, the majority of FTS deals subject to the analysis are issued at a premium. The largest average discount is reported in the Precious Metals & Gemstones sector at -14.7% (median: -14.7%), while the smallest average discount is -1.5% (median: -1.5%) amongst Former Miners.[56] On the other hand, the largest average premium is reported amongst firms in the Gold sector at +21.3% (median: +19.3%), while the smallest average premium is observed in the Iron Ore sector at +1.5% (median: +1.5%).

[Insert Table 2.8]

[53] Firm size also controls for information asymmetry.
[54] Bobenhausen, Breuer & Salzmann (2020) and Mola & Loughran (2004) utilise a similar measure of demand elasticity, scaling the proceeds of the share issuance by market capitalisation.
[55] Asem et al. (2016) employs a similar measure of share price run up, however only calculates share price returns over 30 days. Other studies employ stock return volatility, measured as standard deviation of daily stock returns (Corwin 2003; Kim & Shin 2004; Melia, Docherty & Easton 2020).
[56] As mentioned previously, these firms were MEEs at the time of FTS issuance.

Table 2.9 reports *DiscPrem* by size quartile, again partitioning FTS issued at a discount and FTS issued at a premium. It can be seen the extent of the issuance discount reduces as firm size increases. This reflects the increased level of risk associated with smaller firms, thus their passing on of greater discounts to investors. On the other hand, the extent of the FTS premium applied across quartiles appears to be relatively stable.

[Insert Table 2.9]

Table 2.10 captures descriptive statistics pertaining to *DiscPrem* and its associated factors. *DiscPrem* has a mean (median) of 11% (11%), suggesting the majority of FTS deals are issued at a premium of at least 11%. *ShStructure* indicates a mean (median) of 77% (80%) of shares outstanding are held in free float. Amongst the project location indicator variables, 39% of the FTS deals captured in the sample are associated with firms who own a mineral property in British Columbia, 34% who own a mineral property in Ontario and 31% who own a mineral property in Quebec. Firms have an average of 5.25 projects located in Canada, and the majority of firms have at least 4. Amongst the commodity focus indicator variables, 34% of the FTS deals captured in the sample are associated with firms which have a commodity focus of precious metals, while 50% have a diversified commodity focus.

[Insert Table 2.10]

Table 2.11 provides a correlation matrix. Firstly, it appears that *DiscPrem* is negatively associated with FTS deals where firms have mineral projects located in Manitoba (significant at the $p<0.05$ level) and Ontario (significant at the $p<0.01$ level), and positively associated with firms which have mineral projects in Quebec (significant at the $p<0.01$ level). This result is of particular interest because Quebec does not offer a provincial tax credit like the other provinces, but rather a 120% tax deduction for

qualifying expenses incurred within the province. This result provides partial and preliminary support for H1. The positive and significant (p<0.01 level) association between the number of mineral properties held by a firm and projects located in Manitoba, Ontario, Saskatchewan and Quebec indicate firms with the highest number of projects have them located in these provinces. Firm size also appears to be positively associated with projects located in Manitoba, but negatively associated with projects in British Columbia, Ontario and Saskatchewan (p<0.01 level). It is also negatively associated with a firm commodity focus of precious metals and bulk commodities (p<0.01 and p<0.05 respectively), but positively associated with a diversified commodity focus (p<0.01). A diversified commodity focus appears to be positively and significantly (p<0.01) associated with projects located in British Columbia, Ontario and Quebec. Meanwhile, a precious metals commodity focus appears to have a negative and significant (p<0.01) association with projects located in British Columbia, Saskatchewan and Quebec.

[Insert Table 2.11]

2.6.2 Cross-sectional results

Table 2.12 captures the results of the cross-sectional regression analysis of factors affecting the FTS issuance premium (discount). Model 1 features all explanatory variables and has an Adjusted R^2 of 7.67%, with the F-statistic significant at the p<0.01 level. The first measure employed to proxy for the FTS premium as a pricing mechanism of the tax benefits available to investors is *ShStructure*, which returns an insignificant result. The other proxies are the project location indicator variables. Both Manitoba and Ontario return negative and significant (p<0.10 and p<0.01 respectively) coefficients which contradict the predicted sign. This is particularly interesting, given Ontario offers a 5% refundable tax credit and Manitoba offers a 30% non-refundable

tax credit to tax resident investors on eligible exploration expenditures incurred within the province. Furthermore, Quebec returns a positive and significant (p<0.05) coefficient, while British Columbia and Saskatchewan return insignificant results.[57] Taken together, these results suggest the FTS issuance premium plays a role in pricing tax benefits made available to investors via the FTS program, and that investors are willing to pay a higher premium for Quebec's offering of a 120% tax deduction on qualifying expenditures compared to the offering of tax credits in other provinces (whether refundable or not). These results provide partial support for H1.

The proxies for firm prospectivity (*ExplorExp* and *PrCount*) return insignificant results, providing no evidence the FTS issuance premium (discount) prices firm prospectivity. *Prec* and *Divers* return positive and significant (p<0.05 and p<0.01 respectively) coefficients, indicating the FTS issuance premium is higher where the firm's commodity focus is precious metals and/or diversified at the time of the FTS announcement. In terms of control variables, *DemElast* and *RunUp* return significant results consistent with the predicted sign, while *InfoAsymm* returns a positively and weakly significant result (p<0.10).

The variance inflation factors (VIFs) associated with Model 1 are reported in Table 2.13. Variables associated with commodity focus and prices demonstrate high VIFs (between 3.67 and 9.73), with the mean VIF for the model being 3.10. To ensure the risk of multicollinearity is mitigated, a reduced-form of Model 1 is undertaken. The results of Model 2 are reported in Table 2.12.

[Insert Table 2.13]

[57] British Columbia offers a 20% non-refundable tax credit to tax resident investors on eligible exploration expenditures incurred within the province, while Saskatchewan offers a 10% non-refundable tax credit.

Model 2 omits the control variable *CommPrice* and the indicator variables *Base* and *Bulk*. *CommPrice* is omitted due to the high VIF occurring in Model 1 (as reported in Table 2.13), while *Base* and *Bulk* are omitted since these commodities are least prevalent amongst the different commodity types in the sample.[58] Model 2 has an Adjusted R^2 of 7.72%, with the F-statistic significant at the $p<0.01$ level. *MN* and *Prec* increase in significance to the $p<0.05$ and $p<0.01$ levels respectively, and *AccumLoss* loses the weak significance reported in Model 1. All other results from Model 1 are robust to the modifications in the model, mitigating concerns regarding potential multicollinearity. The mean VIF of Model 2 is 2.31, with the VIFs for each individual variable ranging between 1.09 and 2.87. In untabulated results, incorporating the amount raised in an FTS deal (*AmtRaised*) as a proxy for the levels of qualifying expenditures (rather than capturing the effects of different provinces) returns a positive but insignificant coefficient, suggesting the amount raised in an FTS deal is not associated with the magnitude of the FTS issuance premium (discount).

Table 2.14 contains sensitivity tests of factors affecting the FTS issuance premium (discount) by modifying the definitions of mineral property and commodity variables based on the firm's flagship project. As such, the project location indicator variables are coded =1 if the firm's flagship project is located in the respective province; zero otherwise. *ExplorExp* is based on the exploration expenditure pertaining to the flagship project, the commodity focus indicator variables are coded =1 based on the firm's flagship project (zero otherwise), and *CommPrice* is based on the commodity focus of the flagship project.

[Insert Table 2.14]

[58] As per Table 2.10, *Base* =1 in 11% of observations and *Bulk* =1 in 0.005% of observations.

Model 1 defines the flagship project based on annual exploration expenditure; that is, the mineral project which incurs the highest exploration expenditure in a given firm-year. Model 1 features all explanatory variables[59] and has an Adjusted R^2 of 7.02%, with the F-statistic significant at the $p<0.01$ level. The only project location indicator variable returning a significant result is Quebec (positive and significant at the $p<0.01$ level). Consistent with the results reported previously, investors are willing to pay a higher premium to access Quebec's offering of a 120% tax deduction on qualifying expenditures. *FirmSize* is positive and significant at the $p<0.05$ level, demonstrating larger firms are more likely to issue FTS at a premium. *Prec* and *Base* are both positive and significant at the $p<0.10$ and $p<0.05$ levels respectively, suggesting these commodities are associated with higher FTS issuance premiums. *DemElast* and *RunUp* remain statistically significant consistent with the predicted signs. In untabulated results, the mean VIF for this model is 2.26, with individual variable VIFs ranging between 1.09 and 4.55.

Model 2 defines the flagship project based on the accumulated total of exploration expenditure; that is, the mineral project which has the highest accumulated running total of exploration expenditure in a given firm-year. Model 2 features all explanatory variables[60] and has an Adjusted R^2 of 7.55%, with the F-statistic significant at the $p<0.01$ level. All results in Model 2 are consistent with Model 1, confirming the results are robust to various definitions of flagship project. The mean VIF for this model is 2.24, with individual variable VIFs ranging between 1.10 and 4.49.

[59] With the exception of *Divers*, as each flagship project has a single commodity focus.
[60] With the exception of *Divers*, as each flagship project has a single commodity focus.

2.7 Conclusion

This chapter conducts an exploratory study of the determinants of the FTS issuance premium. Amongst the sample of FTS deals examined, the mean issuance premium is 11% and most FTS deals are issued at a premium of at least 11%. Furthermore, the average discount reported amongst discounted FTS deals is -8.0%, while the average premium amongst FTS deals issued at a premium is +18.5%. The largest premiums are observed in the Gold sub-industry, and the extent of FTS discounting is inversely related to firm size.

Unlike other Canadian provinces which offer provincial tax credits to eligible FTS investors, Quebec offers investors a 120% tax deduction on eligible exploration expenditures. Quebec is the only project location indicator variable which consistently demonstrates a positive and significant relationship to the extent of the FTS premium (discount), suggesting investors are willing to pay a premium to access this form of tax benefit (rather than tax credits offered in other provinces). This finding provides partial support for the conjecture that the FTS issuance premium is a pricing mechanism for the tax benefits FTS afford investors. No evidence is found to suggest the FTS issuance premium acts as a pricing mechanism for firm prospectivity.

These findings contribute to the SEO discounting literature by examining a relatively new type of SEO to understand the determinants of firms issuing equity at a premium (or discount) within the FTS context. It can be seen FTS generally do not conform to the pattern of SEO discounting observed amongst most types of SEOs across many jurisdictions. This chapter also contributes to the taxation economics literature, providing empirical evidence that FTS are an example of implicit taxes whereby taxes are capitalised into prices.

The primary limitation of this chapter is the sample attrition resulting from the time constraints imposed on the hand-collection of firm-year data pertaining to exploration and evaluation assets. Such data also includes the project location and commodity focus of Canadian mineral properties. Another limitation is the proxies employed to measure firm prospectivity are relatively weak compared to others employed in the literature.[61] This is also due to the time constraints imposed on the hand-collection of firm-year data from the financial reports and disclosure levels in Canada. Furthermore, the extent of the tax benefits afforded by FTS is likely to be dependent on the marginal tax rates of individual FTS investors, along with their provincial tax residency status, both of which are unobservable and thus cannot be measured.

Avenues for future research in this area could involve expanding upon the subsample testing conducted in this chapter.

[61] For example, Bui, Ferguson & Lam (2021) utilise 'exploration and evaluation additions' to capture grassroots exploration activities and 'exploration and evaluation acquisitions' to capture project acquisitions.

2.8 Appendix

Table 2.1: Number of FTS deals and issuers, 2001-2019

Year	No. of deals	% of total deals	No. of issuers	% of total issuers
2001	59	1	47	6
2002	101	2	73	9
2003	175	3	119	15
2004	218	4	152	19
2005	281	5	186	23
2006	323	6	202	25
2007	381	7	224	28
2008	348	6	234	29
2009	319	6	216	27
2010	451	8	239	30
2011	395	7	262	32
2012	291	5	175	22
2013	207	4	128	16
2014	238	4	140	17
2015	212	4	137	17
2016	324	6	199	25
2017	372	7	215	27
2018	317	6	186	23
2019	357	7	192	24
Total	5,369		808	

Table 2.2: Number of FTS deals by sub-industry, 2001-2019

	Calendar year of FTS deal																						
Sub-industry	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**Total issues**	**% of total**	**Total issuers**	**% of total**
Coal & Consumable Fuels	4	5	5	6	10	13	10	5	13	12	9	5	14	13	11	9	7	13	13	177	3.3	20	2.5
Copper				1	5	3	6	2	1	3	4	3		2		2	2	4	3	41	0.8	6	0.7
Diversified Metals & Mining	30	48	88	120	152	182	212	180	149	257	196	172	117	134	109	169	199	188	199	2,901	54.0	399	49.4
Gold	15	26	42	37	61	68	83	73	87	115	128	88	53	62	57	95	111	91	120	1,412	26.3	206	25.5
Integrated Oil & Gas					1										1	2	1			5	0.1	1	0.1
Oil & Gas Equipment & Services							1	2	2	3			1	1						10	0.2	2	0.2
Oil & Gas Exploration & Production	2	6	11	23	24	16	24	41	27	20	31	1	4	6	10	16	11	2	1	276	5.1	84	10.4
Precious Metals & Gemstones	5	11	18	15	21	26	30	27	26	28	17	18	14	15	14	18	19	17	19	358	6.7	47	5.8
Silver						2	4	5	6	3			1	1			1			23	0.4	2	0.2
Iron Ore							1	2	1	4	3									11	0.2	7	0.9
Former Miner	3	5	11	16	7	13	10	11	7	6	7	4	3	4	9	8	9	2	2	137	2.6	32	4.0
Unclassified															1	5	12			18	0.3	2	0.2
Total	59	101	175	218	281	323	381	348	319	451	395	291	207	238	212	324	372	317	357	5,369	100	808	100
% of total	1.1	1.9	3.3	4.1	5.2	6.0	7.1	6.5	5.9	8.4	7.4	5.4	3.9	4.4	3.9	6.0	6.9	5.9	6.6	100			

Table 2.3: Issue characteristics of FTS deals, 2001-2019

Issue characteristics	N	Mean	Median	SD	Min.	Max.	Skew.	Kurt.
Private placement	5,369	0.92	1.00	0.27	0.00	1.00	-3.06	7.41
Director part.	5,369	0.29	0.00	0.45	0.00	1.00	0.95	-1.09
Broker part.	5,369	0.08	0.00	0.26	0.00	1.00	3.22	8.35
Underwriter part.	5,369	0.02	0.00	0.12	0.00	1.00	7.76	58.34
Issue price (C$)	5,369	0.31	0.18	0.56	0.01	14.30	10.50	179.12
Discount/Premium	3,448	0.11	0.11	0.18	-0.33	0.54	-0.14	2.99
Issue size (units)	4,338	2.78	0.16	8.94	0.00	52.57	4.53	23.73
Issue size (C$000)	5,369	953.20	378.19	1,838	0.40	28,000	5.62	47.20
Issue size / MC	3,893	0.11	0.06	0.17	0.00	1.01	3.67	17.95
Time to issue (days)	4,614	31.16	21.50	40.32	0.00	652	4.86	43.29

Private placement	= 1 if FTS deal is issued via private placement; zero otherwise
Director part.	= 1 if directors participated in FTS deal; zero otherwise
Broker part.	= 1 if brokers participated in FTS deal; zero otherwise
Underwriter part.	= 1 if underwriters participated in FTS deal; zero otherwise
Issue price (C$)	= FTS issue price, per unit
Discount/Premium	= FTS issue price divided by the average closing price prevailing on the 5 days prior to the FTS announcement, minus 1
Issue size (units)	= total FTS shares offered scaled by ordinary shares outstanding at the month-end prior to FTS issue
Issue size (C$000)	= total dollar amount (in thousands) of capital raised from FTS issue
Issue size / MC	= total dollar amount of capital raised from FTS issue scaled by market capitalisation at the month-end prior to FTS announcement
Time to issue (days)	= difference between the FTS issue date and the FTS announcement date (days)

Table 2.4: Issue characteristics (mean) of FTS deals by sub-industry, 2001-2019

Sub-industry	Discount/ Premium	Issue size (units)	Issue size (C$000)	Issue size / MC	Time to issue (days)
Coal & Consumable Fuels	0.06	0.43	981.46	0.09	24.75
Copper	0.08	0.78	635.24	0.15	35.80
Diversified Metals & Mining	0.12	2.79	804.87	0.11	30.96
Gold	0.12	3.30	1,152.71	0.12	29.20
Integrated Oil & Gas	NA	NA	1,056.56	NA	0.00
Oil & Gas Equipment & Services	0.23	0.88	623.66	0.06	29.67
Oil & Gas Exploration & Production	0.06	1.66	1,641.03	0.10	38.00
Precious Metals & Gemstones	0.07	2.83	900.23	0.09	33.22
Silver	0.02	0.92	601.76	0.06	44.68
Iron Ore	0.12	1.08	2,070.52	0.30	30.60
Former Miner	0.07	2.48	897.95	0.14	40.63
Unclassified	NA	NA	503.64	NA	52.59
Total	0.11	2.78	953.20	0.11	31.16

Table 2.5: Issue characteristics (mean) of FTS deals by size quartile, 2001-2019

Size quartile (based on total assets)	Discount/ Premium	Issue size (units)	Issue size (C$000)	Issue size / MC	Time to issue (days)
Quartile 1	0.07	4.41	509.07	0.16	38.83
Quartile 2	0.10	2.52	568.89	0.12	31.93
Quartile 3	0.12	2.09	910.49	0.10	29.45
Quartile 4	0.14	1.84	1,779.57	0.07	24.12
Total	0.11	2.78	953.20	0.11	31.16

Table 2.6: Firm characteristics of FTS issuing firms, 2001-2019

Firm characteristics		N	Mean	Median	SD	Min.	Max.	Skew.	Kurt.
Age		4,956	17.02	13.00	14.79	0.00	96.00	1.75	7.13
Size	MC	4,800	11.30	5.20	16.20	0.22	81.10	2.71	10.67
	TA	4,955	7.74	3.60	11.20	0.05	57.00	2.66	10.64
	Ln MC	4,800	16.24	15.47	1.42	12.29	18.21	-0.18	2.70
	Ln TA	4,955	15.86	15.10	1.78	10.71	17.86	-0.53	2.88
Growth & investment	BVE / MVE	4,800	0.89	0.50	1.41	-3.55	6.84	2.34	10.53
	CapEx / TA	4,950	0.18	0.10	0.21	0.00	0.92	1.59	5.40
Liquidity	CA / CL	4,948	6.97	2.58	12.29	0.00	73.88	3.46	16.62
Profitability	FCF / TA	4,950	-0.32	0.00	1.38	-10.04	0.80	-4.88	30.09
	EBITDA / TA	4,950	-0.97	-0.22	2.87	-25.92	0.14	-6.21	47.13
Cash holdings	Cash burn	4,747	-0.03	0.00	0.44	-2.54	0.82	-3.03	17.90
	Cash / TA	4,947	0.22	0.10	0.26	0.00	0.97	1.49	4.24
Leverage	TD / TA	4,950	0.14	0.00	0.89	0.00	14.23	12.18	171.9
	TD / (TD+MVE)	4,800	0.04	0.00	0.11	0.00	0.77	3.94	20.26
Resource		2,125	0.46	0.00	0.50	0.00	1.00	0.17	1.03
Reserve		2,125	0.05	0.00	0.22	0.00	1.00	4.07	17.55
Precious		2,125	0.51	1.00	0.50	0.00	1.00	-0.04	1.00
Base		2,125	0.15	0.00	0.36	0.00	1.00	1.92	4.70
Bulk		2,125	0.01	0.00	0.08	0.00	1.00	12.20	149.79
Diversified		2,125	0.09	0.00	0.28	0.00	1.00	2.89	9.34
Other		2,125	0.11	0.00	0.31	0.00	1.00	2.56	7.56
Shareholder structure		4,155	0.76	0.81	0.20	0.00	1.00	-1.78	6.80
Board size		4,883	5.28	5.00	2.54	1.00	12.00	0.41	2.90
Board independence		4,883	0.27	0.25	0.26	0.00	1.00	0.69	2.75
No. of FTS to CE deals		5,369	0.36	0.33	0.39	0.00	1.00	0.55	1.82
Value of FTS to CE deals		5,369	0.34	0.17	0.38	0.00	1.00	0.64	1.84

Descriptive variable definitions can be found at Attachment 2.1.

Table 2.7: Reconciliation of FTS deals subject to the premium analysis

Selection criteria	No. of FTS deals
Number of FTS deals available during the period 2001 to 2019	5,369
Less: FTS deals where data is unavailable to calculate the dependent variable	(1,921)
Less: FTS deals where data is unavailable for one or more explanatory variables	(2,378)
Total number of FTS deals subject to premium analysis	1,070

Table 2.8: Discount/premium by sub-industry

	Discounted FTS deals			Premium FTS deals		
Sub-industry	**N**	**Mean discount**	**Median discount**	**N**	**Mean premium**	**Median premium**
Coal & Consumable Fuels	12	-0.078	-0.066	25	0.131	0.106
Copper	NA	NA	NA	2	0.053	0.053
Diversified Metals & Mining	135	-0.106	-0.061	510	0.183	0.163
Gold	67	-0.133	-0.114	195	0.213	0.193
Integrated Oil & Gas	NA	NA	NA	NA	NA	NA
Oil & Gas Equipment & Services	NA	NA	NA	NA	NA	NA
Oil & Gas Exploration & Production	10	-0.128	-0.145	18	0.136	0.116
Precious Metals & Gemstones	28	-0.147	-0.147	41	0.149	0.104
Silver	12	-0.087	-0.068	7	0.180	0.190
Iron Ore	NA	NA	NA	2	0.015	0.015
Former Miners	1	-0.015	-0.015	5	0.169	0.106
Total	265	-0.080	-0.116	805	0.185	0.159

Table 2.9: Discount/premium by size quartile

	Discounted FTS deals			Premium FTS deals		
Size quartile (based on total assets)	**N**	**Mean discount**	**Median discount**	**N**	**Mean premium**	**Median premium**
Quartile 1	76	-0.137	-0.110	192	0.179	0.124
Quartile 2	68	-0.123	-0.091	199	0.185	0.168
Quartile 3	60	-0.107	-0.069	208	0.190	0.176
Quartile 4	61	-0.089	-0.061	206	0.185	0.159
Total	265	-0.080	-0.116	805	0.185	0.159

Table 2.10: Discount/premium and associated factors

Factors	N	Mean	Med.	SD	Min.	Max.	Skew.	Kurt.
DiscPrem	1,070	0.11	0.11	0.18	-0.33	0.54	-0.12	3.13
ShStructure	1,070	0.77	0.80	0.17	0.15	0.99	-1.14	4.26
BC	1,070	0.39	0.00	0.49	0.00	1.00	0.46	1.22
MN	1,070	0.09	0.00	0.29	0.00	1.00	2.85	9.13
ON	1,070	0.34	0.00	0.48	0.00	1.00	0.66	1.43
SK	1,070	0.11	0.00	0.31	0.00	1.00	2.52	7.35
QC	1,070	0.31	0.00	0.46	0.00	1.00	0.80	1.64
ExplorExp (C$000)	1,070	1,547	494	3,222	-4,331	15,700	2.33	10.27
PrCount	1,070	1.66	1.39	0.82	0.00	3.66	0.09	2.61
Project count	1,070	5.25	4.00	5.16	1.00	39.00	3.12	16.30
FirmSize	1,070	16.16	15.74	0.21	10.99	17.96	-0.59	3.55
Total assets (C$000)	1,070	10,400	6,875	12,100	59.00	63,000	2.45	9.76
Prec	1,070	0.34	0.00	0.47	0.00	1.00	0.67	1.46
Base	1,070	0.11	0.00	0.32	0.00	1.00	2.46	7.04
Bulk	1,070	0.00	0.00	0.07	0.00	1.00	14.53	212.0
Divers	1,070	0.50	1.00	0.50	0.00	1.00	-0.01	1.00
CommPrice	1,070	8.84	7.90	5.14	1.98	28.13	1.12	4.47
AccumLoss	1,070	14.96	15.04	1.06	12.15	17.18	-0.38	3.08
Accumulated losses (C$000)	1,070	3,141	3,402	5,465	189.09	28,919	2.27	8.81
InfoAsymm	1,070	0.95	0.68	1.18	-1.81	17.36	4.75	47.74
DemElast	1,070	1.74	0.19	6.67	0.00	52.57	6.41	46.08
RunUp	1,070	0.01	-0.02	0.41	-0.68	1.50	1.12	5.27

Variable definitions can be found at Attachment 2.2.

Table 2.11: Correlation matrix of the dependent and explanatory variables

Variables	Disc Prem	Sh Struct.	BC	MN	ON	SK	QC	Explor Exp	Pr Count	Firm Size	Prec	Base	Bulk	Divers	Comm Price	Accum Loss	Info Asymm	Dem Elast	Run Up
DiscPrem	1.00																		
ShStructure	-0.05	1.00																	
BC	0.01	0.10 ***	1.00																
MN	-0.07 **	0.12 ***	0.00	1.00															
ON	-0.10 ***	-0.01	-0.23 ***	0.07 **	1.00														
SK	-0.02	0.13 ***	-0.02	0.07 **	-0.04	1.00													
QC	0.08 ***	-0.09 ***	-0.37 ***	-0.09 ***	0.10 ***	-0.10 ***	1.00												
ExplorExp	0.03	-0.12 ***	-0.06 *	0.06 *	-0.04	-0.08 ***	-0.05	1.00											
PrCount	0.02	0.07 **	-0.09 ***	0.17 ***	0.27 ***	0.12 ***	0.26 ***	-0.01	1.00										
FirmSize	0.08 ***	-0.10 ***	-0.11 ***	0.12 ***	-0.05 *	-0.12 ***	0.04	0.51 ***	0.15 ***	1.00									
Prec	-0.02	-0.06 *	-0.10 ***	-0.05	0.04	-0.16 ***	-0.09 ***	-0.09 ***	-0.33 ***	-0.11 ***	1.00								
Base	-0.08 **	-0.07 **	0.03	-0.01	-0.16 ***	0.15 ***	-0.13 ***	0.17 ***	-0.17 ***	-0.00	-0.26 ***	1.00							
Bulk	-0.04	0.04	0.03	0.03	-0.05	0.02	-0.05	-0.03	-0.06 *	-0.07 **	-0.05	-0.02	1.00						
Divers	0.09 ***	0.05 *	0.11 ***	0.05	0.12 ***	0.05 *	0.18 ***	-0.04	0.50 ***	0.09 ***	-0.72 ***	-0.36 ***	-0.07 **	1.00					
CommPrice	-0.06 *	-0.09 ***	-0.02	-0.07 **	-0.04	0.05 *	-0.04	0.09 ***	0.02	0.09 ***	-0.37 ***	0.42 ***	-0.01	0.03	1.00				
AccumLoss	0.05 *	-0.02	-0.16 ***	-0.01	-0.04	-0.00	0.23 ***	0.07 **	0.02	0.34 ***	0.02	-0.02	-0.06 **	-0.02	-0.14 ***	1.00			
InfoAsymm	0.02	0.05 *	0.04	0.04	-0.02	-0.10 ***	-0.03	0.02	0.10 ***	0.32 ***	-0.02	-0.02	-0.03	0.03	0.10 ***	0.11 ***	1.00		
DemElast	-0.09 ***	0.13 ***	0.06 **	0.01	-0.03	-0.05	-0.07 **	0.02	-0.03	-0.00	0.05	-0.02	-0.04	-0.01	-0.01	-0.04	0.04	1.00	
RunUp	0.16 ***	0.03	0.10 ***	0.02	-0.04	0.06 *	-0.06 *	0.02	0.00	0.07 **	0.00	-0.04	0.06 *	0.03	-0.04	0.04	-0.06 **	-0.01	1.00

Variable definitions can be found at Attachment 2.2.

Table 2.12: Cross-sectional regression model of factors affecting discount/premium

Variables	Predicted sign	Model 1 DiscPrem	Model 2 DiscPrem
Intercept	?	-0.121	0.008
		(0.128)	*(0.109)*
ShStructure	+	0.001	-0.005
		(0.035)	*(0.034)*
BC	+	-0.002	-0.001
		(0.013)	*(0.013)*
MN	+	-0.037*	-0.039**
		(0.019)	*(0.019)*
ON	+	-0.041***	-0.040***
		(0.013)	*(0.013)*
SK	+	-0.001	-0.001
		(0.018)	*(0.018)*
QC	+	0.030**	0.029**
		(0.014)	*(0.014)*
ExplorExp	+	0.000	0.000
		(0.000)	*(0.000)*
PrCount	+	-0.003	-0.003
		(0.008)	*(0.008)*
FirmSize	+	0.008	0.009
		(0.006)	*(0.006)*
Prec	?	0.071**	0.045***
		(0.034)	*(0.017)*
Base	?	0.023	
		(0.032)	
Bulk	?	-0.077	
		(0.084)	
Divers	?	0.087***	0.064***
		(0.032)	*(0.018)*
CommPrice	+	0.002	
		(0.003)	
AccumLoss	-	-0.005	-0.005
		(0.007)	*(0.007)*
InfoAsymm	-	0.009*	0.008
		(0.005)	*(0.005)*
DemElast	-	-0.002**	-0.002**
		(0.001)	*(0.001)*
RunUp	+	0.072***	0.071***
		(0.013)	*(0.013)*
Year fixed effects		Yes	Yes
N		1,070	1,070
F-value		3.78***	4.08***
Adjusted R^2		7.67%	7.72%

Variable definitions can be found at Attachment 2.2.

Table 2.13: Variance inflation factors

Factors	**Model 1** DiscPrem	**Model 2** DiscPrem
ShStructure	1.22	1.19
BC	1.39	1.37
MN	1.12	1.11
ON	1.32	1.31
SK	1.20	1.20
QC	1.49	1.48
ExplorExp	1.58	1.56
PrCount	1.69	1.66
FirmSize	2.18	2.15
Prec	9.73	2.46
Base	3.67	
Bulk	1.20	
Divers	9.67	2.87
CommPrice	6.21	
AccumLoss	1.91	1.89
InfoAsymm	1.45	1.89
DemElast	1.12	1.12
RunUp	1.10	1.09
Mean variance inflation factor	3.10	2.31

Table 2.14: Sensitivity testing of factors affecting discount/premium using flagship project

Variables	Predicted sign	Model 1 DiscPrem	Model 2 DiscPrem
Intercept	?	-0.176	-0.134
		(0.118)	*(0.121)*
ShStructure	+	0.008	0.011
		(0.035)	*(0.036)*
BC	+	0.020	0.020
		(0.016)	*(0.016)*
MN	+	-0.036	-0.036
		(0.030)	*(0.030)*
ON	+	0.011	-0.009
		(0.018)	*(0.018)*
SK	+	-0.024	-0.012
		(0.025)	*(0.026)*
QC	+	0.052***	0.067***
		(0.016)	*(0.017)*
ExplorExp	+	0.000	0.000
		(0.000)	*(0.000)*
FirmSize	+	0.015**	0.015**
		(0.006)	*(0.006)*
Prec	?	0.043*	0.033
		(0.022)	*(0.023)*
Base	?	0.046**	0.053**
		(0.021)	*(0.021)*
Bulk	?	-0.085	-0.09
		(0.068)	*(0.069)*
CommPrice	+	0.001	0.000
		(0.002)	*(0.002)*
AccumLoss	-	-0.007	-0.010
		(0.007)	*(0.007)*
InfoAsymm	-	0.003	0.005
		(0.005)	*(0.005)*
DemElast	-	-0.002**	-0.002*
		(0.001)	*(0.001)*
RunUp	+	0.070***	0.075***
		(0.013)	*(0.014)*
Year fixed effects		Yes	Yes
N		1,033	1,021
F-value		3.60***	3.78***
Adjusted R^2		7.02%	7.55%

Variable definitions can be found at Attachment 2.2.

Figure 2.1: Number of FTS deals and issuers, 2001-2019

Figure 2.2: Number of FTS deals issued by each firm, 2001-2019

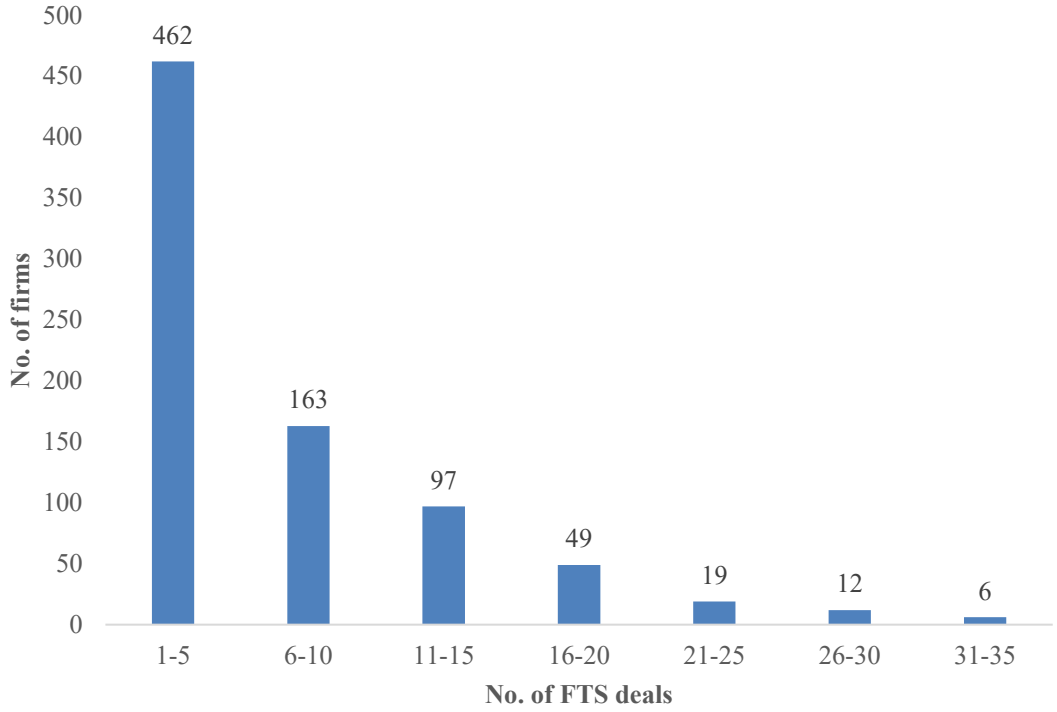


Figure 2.3: Number of FTS deals issued by each firm per year, 2001-2019

Figure 2.4: Number of FTS announcements by month, 2001-2019

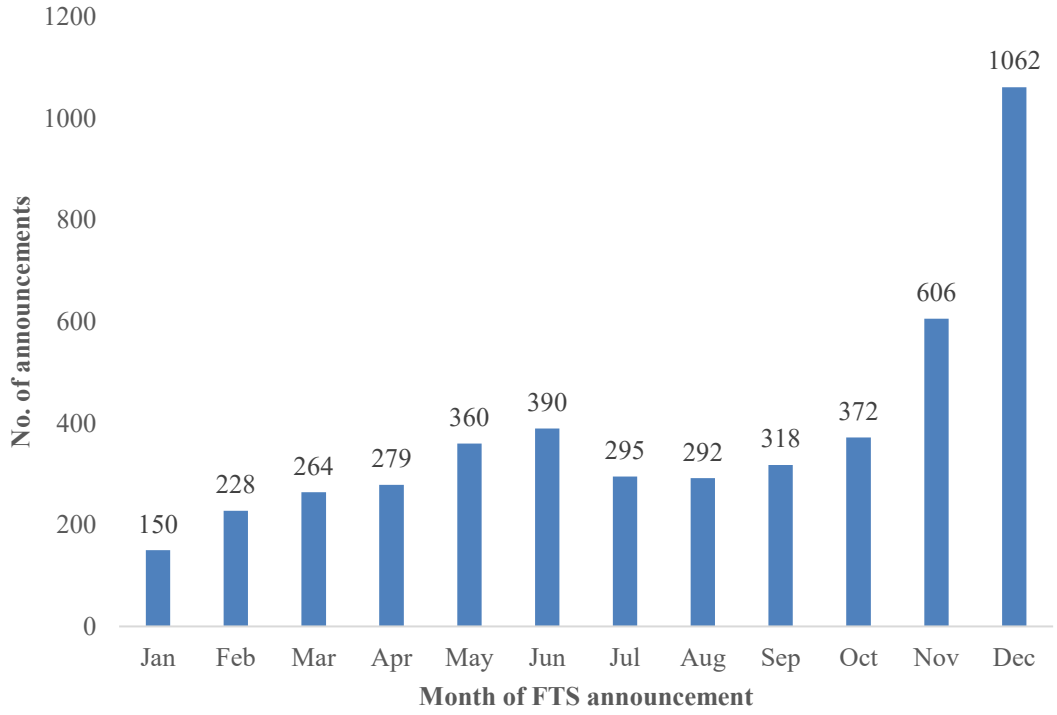


Figure 2.5: Number of FTS issues by month, 2001-2019

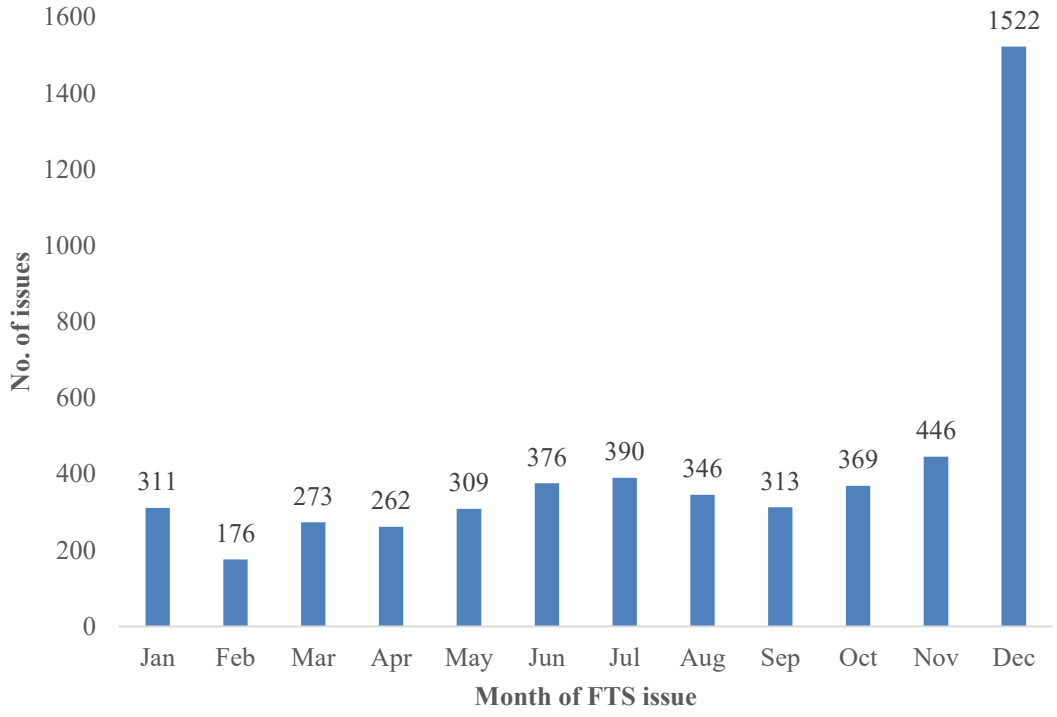
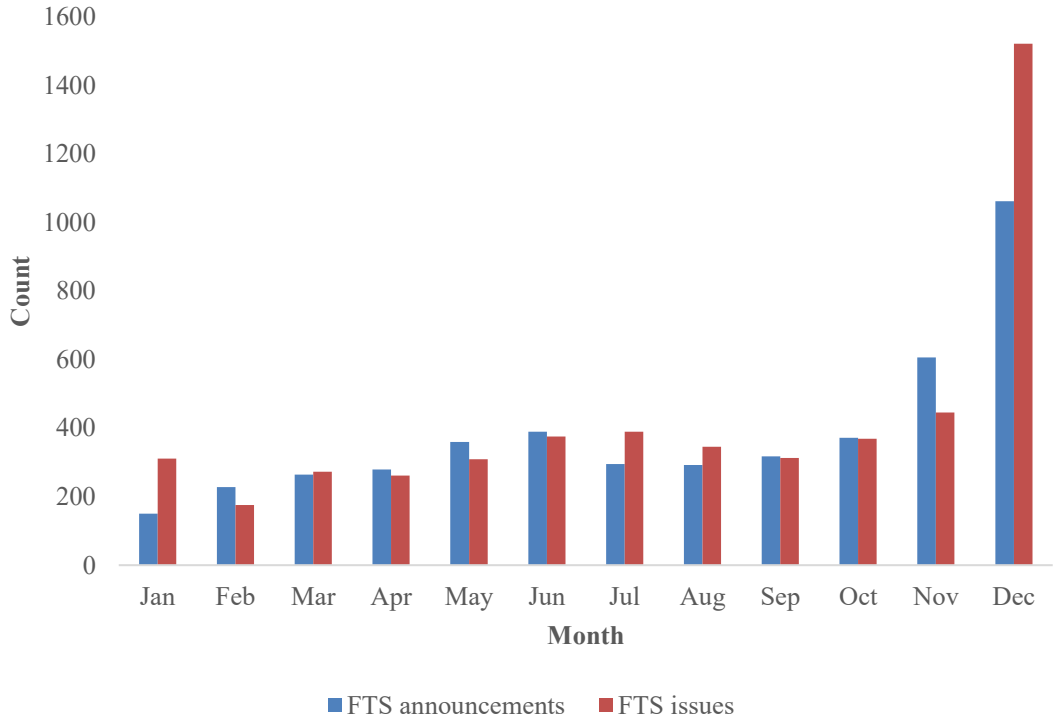


Figure 2.6: Number of FTS announcements and issues by month, 2001-2019



Attachment 2.1: Descriptive variable measurements

Variable	Measurement
Age	= difference between firm incorporation date and FTS issue date (years)
MC	= market capitalisation (C$m)
TA	= total assets (C$m)
Size (Ln MC)	= natural logarithm of market capitalisation*
Size (Ln TA)	= natural logarithm of total assets*
Growth & investment (BVE / MVE)	= book value of equity less convertible equity scaled by market value of equity*
Growth & investment (CapEx / TA)	= capital expenditure scaled by total assets*
Liquidity (CA / CL)	= current assets divided by current liabilities*
Profitability (FCF / TA)	= net cash from operations less net cash from investing activities less total dividends paid out less repayment of borrowings scaled by total assets*
Profitability (EBITDA / TA)	= earnings before interest and tax less depreciation and amortisation scaled by total assets*
Cash holdings (Cash burn)	= cash in the current period* less cash in the prior period scaled by total assets
Cash holdings (Cash / TA)	= cash scaled by total assets*
Leverage (TD / TA)	= book value of total debt scaled by total assets*
Leverage (TD / (TD+MVE))	= book value of total debt divided by the book value of total debt plus the market value of equity*
Resource	= dummy variable =1 if firm reports measured and indicated and/or inferred mineral resource; zero otherwise*
Reserve	= dummy variable =1 if firm reports proven and/or probable mineral reserve; zero otherwise*
Prec	= dummy variable =1 if firm commodity focus is precious metals/gemstones; zero otherwise*
Base	= dummy variable =1 if firm commodity focus is base metals; zero otherwise*
Bulk	= dummy variable =1 if firm commodity focus is bulk metals; zero otherwise*
Divers	= dummy variable =1 if firm commodity focus is diversified across different minerals; zero otherwise*
Other	= dummy variable =1 if firm commodity focus is other than precious/base/ bulk/diversified; zero otherwise*
ShStructure	= shares held in float scaled by total shares outstanding*
Board size	= number of directors on the board*
Board independence	= proportion of independent directors on the board*
No. of FTS to CE deals	= number of FTS deals scaled by total number of common equity deals*
Value of FTS to CE deals	= value of FTS deals scaled by total value of common equity deals*

* Values taken at the balance date prior to FTS announcement

Attachment 2.2: Variable measurements

Variable	Measurement
DiscPrem	= FTS issue price divided by the average closing price prevailing on the 5 days prior to the FTS announcement, minus 1
ShStructure	= shares held in free float scaled by total shares outstanding*
BC	= dummy variable =1 if firm has a project located in British Columbia; zero otherwise*
MN	= dummy variable =1 if firm has a project located in Manitoba; zero otherwise*
ON	= dummy variable =1 if firm has a project located in Ontario; zero otherwise*
SK	= dummy variable =1 if firm has a project located in Saskatchewan; zero otherwise*
QC	= dummy variable =1 if firm has a project located in Quebec; zero otherwise*
ExplorExp	= total Canadian exploration expenditure across all projects*
PrCount	= natural logarithm of total number of projects*
FirmSize	= natural logarithm of total assets*
Prec	= dummy variable =1 if firm commodity focus is precious metals/gemstones; zero otherwise*
Base	= dummy variable =1 if firm commodity focus is base metals; zero otherwise*
Bulk	= dummy variable =1 if firm commodity focus is bulk metals; zero otherwise*
Divers	= dummy variable =1 if firm commodity focus is diversified across different minerals; zero otherwise*
CommPrice	= annualised standard deviation of monthly commodity prices of firm focus commodity*
AccumLoss	= natural logarithm of carry-forward losses*
InfoAsymm	= book value of equity less convertible equity scaled by market value of equity*
DemElast	= number of FTS offered divided by ordinary shares outstanding at the month-end prior to FTS issue
RunUp	= cumulative share price return over the last 60 trading days before the FTS announcement

* Values taken at the balance date prior to FTS announcement

3.0 SHARE PRICE REACTIONS TO ANNOUNCEMENTS OF FLOW-THROUGH SHARE ISSUES

3.1 Introduction

This chapter examines firm share price reactions to announcements of flow-through share (FTS) placements in comparison to other seasoned equity announcements by the same firms. The chapter is organised as follows. Firstly, the motivation for this chapter and contribution to the literature is presented in Sections 3.1.1 and 3.1.2. Section 3.2 contains a literature review which discusses the existing evidence of the announcement effects of various types of security issues, including debt and equity. Section 3.3 details the hypothesis to be tested. This is followed by a discussion of the research methodology in Section 3.4 including variable measurements, namely, offering size, share price run up, offer premium and an indicator identifying FTS placements. Lastly, the findings are discussed in Section 3.5 and Section 3.6 concludes.

3.1.1 Motivation

Little is known empirically about FTS as there is limited published research in the area.[62] Prior descriptive evidence focuses on rates of return for investors and the pricing of FTS relative to pricing of common shares.[63] Chapter 2 of this thesis examines the determinants of the FTS issuance premium. FTS represent a form of seasoned equity offering (SEO), and the objective of this chapter is to understand how the market responds to the announcement of FTS deals compared to other types of SEO.

[62] Empirical evidence is limited to studies of how efficient FTS are as a mechanism for delivering the value of income tax deductions to issuing firms, and the cost effectiveness for both issuers and investors. Jenkins (1990) suggests that the tax revenues foregone in enabling the FTS program outweigh the net benefits obtained by the FTS issuer. On the other hand, Jog, Lenjosek & McKenzie (1996) argue FTS can be cost effective for issuers and are similarly effective to other equity-based financings (such as retained earnings and common shares).

[63] Jog (2016) suggests that while FTS carry tax benefits for investors and have encouraged exploration activity, they do not generate 'reasonable and positive' (p. 18) rates of return for investors.

An example of an FTS announcement can be found at Attachment 3.2. Key features of the announcement include basic details such as the number of FTS to be issued, the issue price and the total proceeds to be raised. Other characteristics of the deal which are typically disclosed include whether the issue is to be conducted via private placement, whether the deal is brokered and/or underwritten, and whether any directors intend to participate. Sometimes other parties to the transaction (such as finders and advisors) are mentioned.

Mineral exploration entities (MEEs) face a high level of risk in terms of the likelihood of discovering a commercially viable mineral resource. To quantify the probability of exploration success, Bartrop & Guj (2009) estimate there is a 0.9% chance of discovering an economically viable orebody in a greenfield exploration project, only a 0.3% chance of discovering a major orebody, and an even lower 0.07% chance of discovering a world-class orebody. The high levels of risk and the slim likelihood of success involved establish a difficult environment for firms to incentivise investment into their projects, which lends itself to high levels of project failure in the sector (Ferguson, Clinch & Kean 2011). This both contributes to, and is exacerbated by, high levels of information asymmetry between shareholders and management in the mineral exploration setting (Bui, Ferguson & Lam 2021; Ferguson & Lam 2021; Ferguson & Scott 2011).

The MEE information problem revolves around managers holding superior private technical information about the firm's mineral projects unknown to shareholders and the market. This is characteristic of the agency relationship, where agents are closer to subject matter than principals, and thus the information available to the participants is

unequal (Arrow 1985; Pratt & Zeckhauser 1985).[64] Furthermore, MEEs are mostly evaluated based on their ore reserves and/or their discovery prospects (Bui, Ferguson & Lam 2021), and it is difficult to predict whether a project will be amongst the 0.9% which successfully discovers an economically viable orebody at the grassroots exploration phase (Bartrop & Guj 2009). These information asymmetries also give rise to agency problems and the risk of moral hazard, where managers might organise opportunities, costs and risks in a manner which serves their own interests at the expense of investors (Arrow 1985; Iddon, Hettihewa & Wright 2013). While investors may see some returns, they might only represent a fraction of the gains created by their investment (Iddon, Hettihewa & Wright 2013). All of these factors are features of the MEE setting,[65] and would contribute to the reluctance of prospective investors who may not be trained in the scientific and technical aspects of the exploration industry, or familiar with the technical terminology.

Such information asymmetries pose a challenge for MEEs because they are reliant on equity funding (Bui, Ferguson & Lam 2021). From the perspective of the pecking order theory (Myers & Majluf 1984), Canadian MEEs are without sources of internal funding (that is, retained earnings) and typically are unable to obtain large amounts of private debt finance until the mine development phase. Thus, MEEs rely on external equity financing such as FTS to fund exploration activities. By enabling the FTS program, the Canadian Government effectively co-invests in mineral exploration activities in Canada

[64] In the MEE setting, principals (shareholders) are unable to observe whether their agents (management) are making appropriate decisions. Theoretically, there are two avenues which mitigate this problem: monitoring and incentives, which each have their own implications as outlined by Pratt & Zeckhauser (1985) and Arrow (1985). When monitoring is costly it is engaged to a lesser extent and/or lower quality. On the other hand, compensation is rarely related to productivity which demotivates workers. Ideally output would be maximised if individuals were paid relative to their marginal productivity, however this is difficult to quantify and implement.

[65] These characteristics are similar to high-tech microcap firms in the US which rely on external equity obtained through private placements because of external financing constraints (Brown & Floros 2012).

by mitigating investor losses (through tax incentives),[66] in the likely event the MEE is unsuccessful in making an economic mineral discovery. While private investors are interested in financial returns, governments are largely interested in the generation of positive externalities (Bai et al. 2022). MEEs represent the potential generation of significant positive externalities through employment creation and high tax revenues in the event a mining exploration project is successful.

Due to the nature of their operations, MEEs can be likened to microcap biotechnology research and development (R&D) firms. These biotech firms are faced with high levels of inherent risk and in turn require high levels of investment to fund R&D activities for a chance to bring safe and effective products to market. Anecdotal evidence describes Australia as a 'leading destination for biotech innovation' due to the Australian Government's R&D Tax Incentive program (Qi et al. 2021). The program provides a refundable tax incentive of up to 43.5% of eligible R&D expenditure for firms with a turnover of less than A$20 million, and evidences the need for governments to incentivise investment into these high-risk sectors by way of tax breaks.

MEEs can be regarded as R&D firms because of the extensive research, scoping and testing which goes into locating and determining the commercial viability of a mineral resource.[67] These activities result in intangible assets. Ferguson & Lam (2021)

[66] According to Pratt & Zeckhauser (1985), "the theory of market failure [has] helped provide an intellectual justification for government interventions in the marketplace. Some of these interventions... are intended to facilitate the functioning of the private market" (p. 22). This is further justified in industries with high levels of information asymmetry where customers are met with difficulties judging output and agency problems arise (Pratt & Zeckhauser 1985). The FTS program can be seen as a means of soft government intervention in the mineral exploration market in an effort to mitigate agency problems associated with information asymmetry, and thus encourage private investment.

[67] According to the JORC Code (Joint Ore Reserves Committee 2012), "a company must disclose all relevant information concerning exploration results, mineral resources or ore reserves" (p. 9). The Code establishes minimum standards, recommendations and guidelines for reporting this information, and is incorporated into the listing rules of the Australian Securities Exchange and New Zealand Stock Exchange. This involves correctly classifying tonnage and grade estimates to capture the level of geological confidence and the appropriate degree of technical and economic evaluation. Any mineral resource discovered should be estimated using geoscientific information and any relevant input from other discipline areas. As levels of geological knowledge and confidence increase with respect to a

specifically liken MEEs to biotechnology firms due to their long project life cycles, high levels of information asymmetry and high risk profile. As demonstrated in Attachment 3.3, mining projects have long life cycles which consist of many phases and stages, including exploration, scoping and feasibility, development, production and post-production. For example, gold projects are estimated to span approximately 10 years from the discovery stage to the production stage,[68] while base metal projects (such as copper, lead, zinc and nickel) generally span 15-25 years (Ferguson & Lam 2021). These are similar project lifespans to those of biotechnology firms, which span approximately 10-20 years as reported by Lerner, Shane & Tsai (2003) and Robinson & Stuart (2007).

In most cases, the process of an MEE conducting exploration activity and generating geological knowledge and confidence sufficient to estimate the size and extent of a mineral deposit takes many years. These in-ground resources are not guaranteed to be economic despite extensive feasibility studies (Ferguson & Lam 2021).[69] Information asymmetries are also observed amongst biotechnology firms. Information issues are also argued to be correlated across firms (Lerner, Shane & Tsai 2003). As such, unexpected bad news involving one firm can lead investors to reassess their previous understanding/beliefs of the viability of R&D for the industry as a whole.

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resource (and it becomes considered as 'indicated' and/or 'measured'), ore reserve levels can be identified and considered in light of modifying factors which determine the viability of extracting the ore. These factors include: "mining, processing, metallurgical, infrastructure, economic, marketing, legal, environment, social and government" (p. 9). Refer to excerpt in Attachment 3.4.
Canadian mining firms are subject to mandatory disclosure requirements under the Canadian Institute of Mining, Metallurgy, and Petroleum (CIM) standards. National Instrument 43-101 (NI43-101) establishes minimum standards pertaining to the disclosure of technical information, and considers the JORC Code to be an 'acceptable foreign code' which defines mineral resources and reserves in a consistent and comparable manner (Canadian Securities Administrators 2011).

[68] With reference to the diagram in Attachment 3.3, these are Stages 3 and 21 respectively.

[69] With reference to the diagram at Attachment 3.3, this relates to the Scoping and Feasibility Phase.

An example of these information problems involves Bre-X Minerals, where the company's claims of having discovered the world's largest gold deposit in Indonesia were proven fraudulent in 1997. Despite neither Bre-X nor its sister companies being listed on the Vancouver Stock Exchange,[70] the Vancouver Composite Index fell from 1,307.99 on 20 March 1997 (just prior to first reports that independent tests were inconsistent with Bre-X company claims) to 1,003.53 by 5 May 1997 (when an independent consulting firm issued its final report confirming Bre-X assay results were fraudulent). The Index continued to drop thereafter, reflecting the impact of a loss in investor confidence in MEEs (which were unaffiliated with Bre-X). As MEEs are mostly evaluated based on their ore resources and reserves and/or their discovery prospects (Ferguson & Pundrich 2015), stock values are sensitive to investor sentiment, usually driven by commodity prices. If investors are bearish on the sector, firms face increased difficulty in funding exploration activities, limiting their chances of moving projects through the mine life cycle. Brown Jr & Burdekin (2000) conduct an event study analysing this particular case and find the Bre-X scandal was responsible for the collapse in investor confidence across the entire mining sector, with smaller MEEs being most impacted. They note a single instance of fraud and misinformation can cause investors to re-evaluate the quality and accuracy of information released by similar firms, highlighting that information problems are correlated across firms.

Lastly, the high levels of risk faced by MEEs are evident in the fact the estimated probability of discovering an economically viable orebody in a greenfield exploration project is 0.9%, which reduces further for a major orebody and a world-class orebody (Bartrop & Guj 2009). Similarly low success rates are reported in the case of pharmaceutical R&D (Robinson & Stuart 2007). For example, for every 5,000-10,000

[70] At the time, the majority of firms listed on the Vancouver Stock Exchange were MEEs.

pharmaceutical compounds identified, only 250 reach pre-clinical testing (that is, 2.5%-5%). Furthermore, only approximately 20% of drugs which commence first phase trials are ultimately approved by the regulatory body.

In light of MEE similarities with R&D firms, the FTS program represents the Canadian Government's means of de-risking, and subsequently incentivising investment into, the high-risk junior mineral exploration sector. It does so by granting tax benefits to the initial purchaser of FTS, which include: a tax deduction for the amount of qualifying expenditures renounced by the firm up to the amount invested by the FTS holder; a 15% federal tax credit for certain 'grassroots' expenses incurred and renounced to the FTS holder (eligible to be carried forward and back);[71] provincial tax credits of varying rates (depending on location);[72] and concessional capital gains tax treatment upon disposal of the FTS. Following the Bai et al. (2022) conceptual framework, while the Canadian Government does not have a direct ownership stake in any MEE, it allows private investors the opportunity to participate at a subsidised rate through favourable policy arrangements which enable tax-effective exposure to mining project upside, while providing a degree of downside protection. This approach makes investment more affordable for private parties without exposing the Government to downside risk and jeopardising public resources.

Providing a framework for a tax-effective form of investment in this sector enables the Canadian Government to provide implicit assurance and implicit monitoring to mitigate governance issues (such as moral hazard and adverse selection concerns due to high information asymmetry) (Akerlof 1970). This incentive-based investment framework may cause the announcement effects for FTS issuers to be higher compared to other

[71] Available to individual investors only (that is, single persons or individual members or a partnership, not corporations).
[72] Available to individual tax-resident investors in specific Canadian provinces only.

forms of SEO. The framework implemented by the Canadian Government limits moral hazard downsides caused by high information asymmetry[73] through legislation on the acceptable use of FTS proceeds and timeframes on when eligible expenditure must be incurred and renounced to investors.[74] Where firms fail to comply with these provisions (by improper use of FTS proceeds or failing to incur and renounce eligible expenditure within the established timeframe), firms are liable to indemnify FTS investors for additional taxes payable by them as a result of their inability to claim the MEE's eligible expenditures in their tax return (up to the amount invested by them personally).[75] The tax benefits provided achieve a two-fold purpose. Firstly, they mitigate investor losses in the likely event the exploration activity of the MEE is unsuccessful. Conversely in cases where exploration activity is successful, investors gain from investment upside and are subject to concessional capital gains tax treatment upon disposal of the FTS. As such, the Canadian Government effectively co-invests in FTS placements through this investment framework designed to alleviate high information asymmetry and provide tax-effective exposure to mining project upside.

By examining the share price reaction to FTS announcements, a better understanding of the market's perception of the FTS program can be established. Since the Canadian Government aims to de-risk investment in Canadian MEEs through the provision of tax breaks (rendering FTS a relatively attractive investment), it would be reasonable to expect a positive share price reaction to the announcement of an FTS deal (contrary to the typically negative market reaction to SEOs documented in the literature). This

[73] Forms of government support can be an effective means of mitigating under-supply in innovation due to information asymmetries which can lead to adverse selection and/or moral hazard issues (Brander, Du & Hellmann 2015), given that expected agency costs increase where assets become less tangible, and growth options and asset specificity increase (Gompers 1995). This is the case in the MEE context.
[74] According to Bernstein, Giroud & Townsend (2016), a reduction in monitoring costs should translate to better venture firm performance.
[75] A written subscription agreement which governs the issuance of FTS must be in place between the FTS issuing firm and FTS investors. Terms pertaining to indemnification are included therein.

subsequently leads to a better understanding of how third party assurance in the form of Canadian Government support of FTS issuance assists in mitigating the risks associated with investment in the MEE space.

3.1.2 Contribution

FTS are a frequently issued type of SEO designed to boost investment in the high risk mineral exploration industry. The level of inherent risk (likely to deter investors) is largely driven by long project lifecycles, slim chances of exploration success, and a highly technical information environment. As such, the primary objective of the FTS program is to incentivise investment through the availability of several tax benefits, including accelerated tax deductions up to the amount invested; federal tax credits equivalent to 15% of certain qualifying exploration expenditures renounced to FTS holders; provincial tax credits between 5% and 30% (depending on location and tax status) of qualifying expenditures renounced to investors; and concessional capital gains tax treatment upon disposal of the FTS. These tax benefits mitigate the risks of investing in MEEs by reducing the investor's federal and provincial tax liabilities, thus lowering the effective tax rate paid by the investor on their taxable income. As such, the tax benefits associated with FTS not only mitigate the risks involved in investing in MEEs, but are also beneficial to the investor's entire income base from a tax minimisation perspective. As such, this thesis contributes to a body of literature where governments intervene in markets demonstrating high information asymmetry.

As mentioned above, limited published empirical research exists which studies FTS. However, the broader SEO literature is extensive and covers the share price reaction to various types of SEOs, including public and private issues of common stock, preferred stock, convertible preferred stock, and rights issues. Given that SEOs raised US$1,146 billion for US companies alone between 2000 and 2011 (Veld, Verwijmeren &

Zabolotnyuk 2020), it is evident they make an economically significant contribution to capital markets in general. This thesis contributes to the extant SEO literature by examining the market reaction to the announcement of FTS issues which are distinguished from examples in the prior SEO literature by the specific tax incentives obtained by the investor. FTS deals are effectively a co-investment by the Canadian Government in mineral exploration, and work to mitigate the high levels of information asymmetry present in the MEE sector while providing investors with tax effective exposure to project upside. As noted in previous chapters, FTS are largely issued by way of private placements[76] since FTS issuers face external financing constraints. Studying this share price reaction will serve to enhance understanding around the impact and market perceptions of FTS, and extend the coverage of the SEO and PIPEs literature to include FTS.

3.2 Background literature

3.2.1 Share price reaction to the announcement of security issues

Prior research has documented the share price reaction to the announcement of various types of SEOs, which are typically associated with negative market reactions. The cross-sectional regressions conducted in these studies indicate the type of security announced is the most important determinant of the subsequent share price reaction. The significant price reaction to the announcement of security issues confirms these announcements typically convey substantial new information to the market. The SEO anomaly has also proven to be one of the most robust capital market anomalies, being present across many studies in various jurisdictions over a long period of time.

[76] Also referred to in the literature as 'private investments in public equities' (PIPEs).

Veld, Verwijmeren & Zabolotnyuk (2020) conduct a meta-analysis using a sample of results collated from 199 studies from different jurisdictions examining event period abnormal returns associated with SEO announcements.[77] The key findings include: generally US SEOs are associated with more negative abnormal returns; information asymmetry is not found to have a significantly negative effect on announcement returns; private placements are associated with less negative announcement returns; and SEOs issued to pay off debt are associated with more negative announcement returns (pp. 118-119).

Smith (1986) summarises literature pertaining to the announcement effect of various SEOs, specifically public issues of common stock, preferred stock, convertible preferred stock, straight and convertible debt. Three key generalisations arise: average abnormal returns are non-positive; abnormal returns associated with announcements of common stock issues are negative and larger than for preferred stock or debt issues; and abnormal returns for announcements of convertible securities are negative and larger in absolute value than non-convertible securities. US research consistently reports an average negative and significant stock price response of about -2% to the announcement of common stock and convertible debt offerings (Asquith & Mullins 1986; Eckbo & Masulis 1992; Hansen & Crutchley 1990; Helou & Park 2001; Heron & Lie 2004; Korajczyk, Lucas & McDonald 1990; Masulis & Korwar 1986; Mikkelson & Partch 1986; Veld, Verwijmeren & Zabolotnyuk 2020).

Asquith & Mullins (1986) find stock prices fall in association with external equity financing by firms. This could explain managerial reluctance to issue equity, and indirectly supports the pecking order theory (Myers & Majluf 1984). A recent study considering the impact of the COVID-19 pandemic in the Chinese setting also suggests

[77] The mean (median) abnormal return reported for SEOs is -0.98% (-1.39%).

investors respond more negatively to SEO announcements where firms are located in regions highly impacted by the pandemic, relative to those which are less impacted (Xiao & Xi 2021).

Prior research finds the issue method is one of the key determinants of share price reaction in respect of equity issues (Armitage 1998; Burton, Lonie & Power 1999; Eckbo & Masulis 1992). Whether equity is issued in public or private markets also influences the share price reaction. Gomes & Phillips (2012) conjecture abnormal returns should be positively (negatively) related to the degree of information asymmetry for private (public) offerings, and increasingly strong where a security is more sensitive to information. This has implications for the FTS context, suggesting that more positive abnormal returns should be expected owing to the employment of private placements in a high information asymmetry setting.

Private placements are known to be an important source of financing for small firms which rely on highly specialised capital to operate, since they are unable to internally finance investment and face difficulty obtaining finance externally (Brown & Floros 2012). Wruck (1989) finds a positive two-day market reaction of 1.9% following the announcement of a private placement. Subsequent studies confirm this finding of significantly positive announcement effects in respect of private placements, which is consistently positive across countries including the US, the UK, Sweden, China and Japan (Cronqvist & Nilsson 2005; Hertzel et al. 2002; Hertzel & Smith 1993; Huang et al. 2021; Kang & Stulz 1996; Krishnamurthy et al. 2005; Liu et al. 2016; Slovin, Sushka & Lai 2000; Wu, Wang & Yao 2005).

Akhigbe & Whyte (2015) explore internal capital market efficiency as a means of mitigating the negative announcement returns commonly reported around SEOs. They report a positive and significant relation between internal capital market efficiency and

abnormal returns around SEO announcements, which is most apparent among firms with more diversity in their SIC segment codes, but reporting fewer segments. Essentially, this diversification in segments is perceived by the market as reducing the uncertainty around the value of assets-in-place and being indicative of a more efficient firm.

Armitage (1998) discusses the emerging equity financing paradox, whereby a large proportion of firms issuing common stock do so by employing the relatively more expensive issuance method. The issuance method is more expensive in terms of direct costs and the negative share price reaction. For example, US firms mainly employ non-rights issues despite rights issues appearing to be cheaper, and UK firms mainly employ underwritten rights issues although underwriting increases direct costs. Companies might make this decision to signal the greatest credibility, or 'degree of certification' in the respective domestic market,[78] thereby encouraging a positive share price reaction.

The degree of certification is a potential explanation accounting for the differences in announcement effects between countries. For example, the literature documents a significantly negative stock price reaction of about -3% in the US setting following an SEO announcement[79] (Asquith & Mullins 1986; Helou & Park 2001; Masulis & Korwar 1986; Mikkelson & Partch 1986), which differs from the positive or insignificantly negative stock price reaction documented in Europe and Japan (Bohren, Eckbo & Michalsen 1997; Gajewski & Ginglinger 2002). Differences in certification arise from differences in the equity offering terms, which can mitigate or strengthen the weight of underwriter certification in regard to the respective offering (Slovin, Sushka

[78] For example, US firms typically employ non-rights issues although they appear to be more costly. On the other hand, UK firms typically issue underwritten rights despite underwriting increasing direct costs of the respective issue.

[79] Negative announcement price effects are observed following SEO announcements in China, subject to a different regulatory system to the US and Europe (Shahid et al. 2010).

& Lai 2000). For example, in the US and Canadian settings firms can adjust the price and size of the equity offering after the initial announcement is made. Chan et al. (2018) find investment bankers revise SEO offering sizes upwards to signal firm quality to their buy-side clients, and that these firms experience positive returns throughout the registration period and on the offer date. Meanwhile, Slovin, Sushka & Lai (2000) argue the flexibility afforded firms in such jurisdictions mitigates the weight of the respective underwriter's certification.

On the other hand, other jurisdictions mandate definitive offering terms at the initial announcement, thereby strengthening the weight of the underwriter's certification. As such, stronger certification is seen to reduce the negative announcement effect and provides a plausible explanation for differences in the stock price reaction observed across countries. Larger mature firms are observed to contract with prestigious investment bankers, while small high-growth firms typically engage non-prestigious underwriters, which can be expected to impact the perceived degree of certification (Schadler & Manuel 1994). This thesis extends prior underwriter certification literature by arguing the Canadian Government provides implicit assurance to FTS issuers through a favourable tax framework.

Brown, Ferguson & Stone (2008) study the announcement effect on a sample of share purchase plans (SPPs) in the Australian context. They find share prices react negatively to the announcement of an SPP issue, and that the magnitude of the reaction is related to the relative size of the SPP issue, share price run up, the extent of the discounted SPP issue price, industry and whether non-existing shareholders are able to purchase shares to therefore become eligible to partake in the SPP. It is suggested that the announcement of an SPP by a mining firm is interpreted as a positive signal by the market (Brown, Ferguson & Stone 2008). This could be driven by the market perception that increased

fundraising by mining firms translates to increased mineral exploration, and thus raises the probability of mineral discovery. It is noted that SPPs accompanied by private placements experience a less negative announcement effect.

According to Brown, Ferguson & Sherry (2010), MEEs which lose value during the year exhibit higher trading volumes at the financial year-end, which is indicative of such firms being vulnerable to tax-loss selling.[80] Taken together with the findings of Brown, Ferguson & Stone (2008), there is a possibility that investors react positively to MEE fundraising, but where those firms subsequently lose value, investors dispose of their MEE holdings and offset their losses against capital gains accrued on other shares in their portfolio. As such, there is a possibility that higher announcement returns are generated by investors purchasing FTS with the tax benefits in mind. Investors benefit from exposure to exploration upside as well as a tax shield available for any capital losses, which can be carried forward indefinitely (or backward up to three years) and offset against other capital gains. This is supported by prior literature which notes investors may intentionally invest in stocks with potential to yield tax losses (Brown & Ferguson 2005).

3.2.2 Theories explaining share price reaction

The extant literature posits a number of theories which attempt to explain the US phenomenon whereby the firm's announcement of a public offering exhibits a negative share price reaction. These theories include the signalling, information asymmetry and agency theory hypotheses.

[80] 'Tax-loss selling' refers to the disposal of shares which have fallen below their original purchase price as a means of realising capital losses which can be offset against other capital gains. FTS are insulated against tax-loss selling activity because upon disposal a capital gain is always realised. This is because the amount invested by the FTS holder has already been renounced to them by the MEE and claimed as a tax deduction in the investor's tax return. This renders the cost base of the FTS as nil, meaning the proceeds of the sale are fully taxable (subject to the Canadian capital gains tax inclusion rate of 50%). Furthermore, a holding period ranging between 4 months and 2 years also applies to FTS.

3.2.2.1 Signalling theory and managerial shareholdings

Leland & Pyle (1977) present a signalling model which predicts changes in managerial shareholdings produce similar changes in firm value. Since investors assume managers are more informed regarding the firm's expected future cash flows, managers' fractional ownership in the firm is perceived by investors to represent a signal of firm value. Rational managers would not hold a substantial portion of the firm's shares if they knew the firm's current value is high relative to anticipated future cash flows. As such, an equity issue which reduces managers' shareholding conveys a negative signal regarding firm value.

Masulis & Korwar (1986) examine a subsample of 56 equity offerings which feature a primary equity issue alongside a secondary offering by the firm's management. The subsample returns an announcement period return of -4.5%, whereas the total sample average return is -3.1%, demonstrating that a reduction in management shareholdings results in a negative announcement effect.

3.2.2.2 Signalling and implied changes in expected net operating cash flow

Miller & Rock (1985) propose a signalling model which suggests that changes in outside financing act as a signal to investors of opposite changes in the firms' earnings. Smith (1986) extends this argument in a study which examines the impact of announcements on implied changes in expected cash flows. The study finds evidence consistent with the hypothesis that market participants interpret changes in operating cash flows from SEO announcements which do not explicitly associate sources with specific uses of funds. The argument for equity issuance predicts a negative share price reaction in proportion to the dollar value of the announced SEO.

3.2.2.3 Information asymmetry hypothesis

The adverse selection model of Myers & Majluf (1984) assumes that investors believe managers hold superior private information, and as such, managers will only issue equity when they have reason to believe the current share price is overvalued. In response, a negative announcement effect is predicted for SEOs because investors perceive the stock to be overvalued at its current price. Negative reactions are seen to be more prevalent among firms which demonstrate greater information asymmetry between managers and shareholders. Studying a sample of debt and equity issues in Canada, Dong et al. (2012) find that firms issue equity when their shares are overvalued, but only in cases where firms are not financially constrained.

Hertzel & Smith (1993) consider private placements in view of the information asymmetry hypothesis. They argue private placement investors can assess the value of the firm by way of their negotiations with management at a cost (reflected in the share price discount), suggesting private placements can mitigate the underinvestment problem where firms are undervalued. As such, when private placements are announced they imply favourable information regarding the value of the firm, which could account for the positive share price reaction recorded in some jurisdictions. This notion is supported by Sony & Bhaduri (2022) who find private placements are chosen (instead of rights issues) in cases where firms face greater information asymmetry, as private placements allow firms to bypass information costs and potentially signal private information to usually larger investors. These costs are circumvented by the firm and taken up by private investors instead. In contrast, Burton, Lonie & Power (1999) argue the information asymmetry model cannot predict share price movements when equity issues are only made available to existing shareholders, as there are different incentives and implications of issuing equity to new and existing investors, as suggested by Myers & Majluf (1984).

3.2.2.4 Agency theory hypothesis

When a larger proportion of share ownership is held by management, Jensen & Meckling (1976) posit the agency conflict is reduced between managers seeking utility maximisation, compared to external investors seeking value maximisation. When a public offering is issued, the cash under the control of management increases without a corresponding increase in monitoring. This would increase agency conflicts, and is expected to induce a negative share price reaction. In a private placement scenario, whereby a successful placement would result in increased monitoring of management by larger and more sophisticated shareholders, agency theory predicts a positive share price reaction.

3.2.3 Factors affecting the share price reaction to a seasoned equity offering announcement

The extant literature provides evidence of a number of factors affecting the announcement returns of SEOs. Such factors include the offering size, share price run up, discount, leverage, industry, use of proceeds, director participation and the presence of an underwriter.

3.2.3.1 Relative offering size

Research indicates that relative offering size has a positive relation with the degree of information asymmetry. Consistent with the signalling hypothesis outlined above, Masulis & Korwar (1986), Gajewski & Ginglinger (2002) and Bayless & Chaplinsky (1996) find the share price decrease on the date of the announcement is positively related to the size of the equity offering. Fama & French (2008) find larger net issues of stock are associated with lower future returns, and this is consistent across microcaps, small stocks and large stocks. These findings are not supported by Marsh (1979),

Mikkelson & Partch (1986) and Barclay & Litzenberger (1988), who find no significant relationship between the share price reaction and the offering size.

Large variations in SEO sizes are reported across different security offering methods (Burton, Lonie & Power 1999; Eckbo & Masulis 1992). Burton, Lonie & Power (1999) find the issue method directly influences the market reaction to SEO announcements, rather than the issue size itself.

3.2.3.2 Share price run up

Consistent with the information asymmetry hypothesis, a negative relationship exists between share price announcement returns and prior share returns at various measurement windows (Gajewski & Ginglinger 2002; Helou & Park 2001; Masulis & Korwar 1986). According to information asymmetry explanations, this could arise due to managers delaying equity issues until they believe the stock is no longer undervalued.

3.2.3.3 Discount

The information asymmetry hypothesis suggests it is more costly for investors to evaluate firms which exhibit greater information asymmetries, therefore the additional cost gives rise to larger share price discounts. It also conjectures a negative relation between the discount and the share price reaction to the announcement. These inferences are supported by the findings of Slovin, Sushka & Lai (2000) and Hertzel & Smith (1993). On the contrary, Marsh (1980), Eckbo & Masulis (1992) and Gajewski & Ginglinger (2002) find evidence that the discount has no effect on the market reaction to the offering announcement. It is also noted that underpricing is positively related to the relative offer size, particularly amongst securities with relatively inelastic demand (Corwin 2003). This aspect of the prior SEO literature is interesting as most FTS issues

are priced at a premium, reflecting the sizeable tax benefits associated with the issues which are effectively underwritten by favourable tax policy.

3.2.3.4 Leverage

Masulis & Korwar (1986) find a positive relationship between equity offering announcement returns and firm leverage changes. However, collinearity is found between changes in leverage and the issue size, making it difficult to assess which variable is mostly associated with the share price reduction. In addition to collinearity, Asquith & Mullins (1986) identify further issues relating to the association between share price reactions and changes in capital structure. Firstly, new equity issues typically only comprise a small proportion of total capital, meaning the impact on financial leverage is small relative to the reduction in equity value associated with the given stock issue. Additionally, changes in leverage levels caused by the issuance of equity could be transient. It is unlikely that leverage will play a role in FTS issues as MEEs typically source little debt prior to project financing apart from small seed loans for feasibility studies, small bridge loans for acquisitions and small director loans for working capital (Ferguson & Lam 2021; Myers & Majluf 1984).

3.2.3.5 Industry

Smith (1986) indicates the abnormal returns related to securities issued by industrial firms are typically larger than those issued by utility firms (in absolute value terms). Consistent with this view, Masulis & Korwar (1986) and Asquith & Mullins (1986) report a significantly larger share price reaction for industrial firms[81] (-3.3% and 2.7%) than for regulated public utility firms (-0.7% and -0.9%). The authors distinguish

[81] Industrial firms exclude banking, insurance and other financial firms, and transportation and utility firms (Mikkelson & Partch 1986).

between industrial and utility firms due to differences in the respective regulatory frameworks, where utility firms are subject to less information asymmetry. As such, the security issuances of utility firms are better anticipated by the market, explaining why the share price reaction is larger for industrial firms than utility firms.

3.2.3.6 Use of proceeds

Mikkelson & Partch (1986) establish five respective categories which describe the reasons giving rise to equity offerings. They find the average decrease in the share price is greater where the stated purpose of the issue is to refinance debt (-4.19%), as opposed to funding capital expenditures (-1.32%). The share price is demonstrated to react favourably where firms state their intention to finance new investments (Gajewski & Ginglinger 2002; Hertzel & Smith 1993).

Walker, Yost & Zhao (2016) extend these findings to test whether firms following through on their stated use of proceeds in prior SEO issues works to establish credibility for subsequent SEOs in the future. Firstly, their results suggest firms which state investment in new projects as their use of proceeds experience relatively more positive announcement returns in response to subsequent SEO announcements. Furthermore, they find firms not making these statements but regularly using SEO proceeds to fund new projects experience positive returns in response to subsequent SEO announcements. These findings suggest markets take into account the potential agency costs of equity issuances and firms' historical use of proceeds, regardless of what is (or is not) stated in the SEO announcement. Duca (2016) reports similar findings consistent with the view that market feedback impacts investor beliefs and perceptions around firm investment opportunities in subsequent SEOs.

On the other hand, Masulis & Korwar (1986) and Barclay & Litzenberger (1988) demonstrate the use of equity issuance proceeds has no significant effect on average announcement returns. Meanwhile, Kim & Purnanandam (2014) posit that investor confidence in management's stated use of proceeds stems from the strength of the firm's corporate governance. They find the market reaction to SEOs is positively and significantly related to the strength of governance.

In the context of FTS issues, financing proceeds legally must be used to incur 'grassroots' and pre-production expenditures to be eligible for flow-through to investors, as discussed in Section 1.3.1. This reduces information asymmetry and removes moral hazard in relation to the use of proceeds. As such, whether this use of proceeds is stated in the announcement or not, the market knows ex-ante the required use of funds when an announcement is made, thus reducing use of proceeds risk and contributing to positive announcement FTS returns.

3.2.3.7 Director participation

New equity offerings usually impact the fractional shareholdings of firm directors. According to prior research, whether directors participate in an equity offering or not has different implications on the announcement effect. For example, a negative relationship is identified between the announcement effect and decreases in management shareholdings in the case of industrial firms (Masulis & Korwar 1986). This is supported by the findings of Gajewski & Ginglinger (2002), who find the share price reaction is negatively related to the proportion of the new equity issue made available to external investors. When the proportion of insider participants is greater the market responds more favourably to the new issue, while the share price shows no reaction to the proportion of common stock held by the largest 20 shareholders (Bohren, Eckbo & Michalsen 1997). Furthermore, insider ownership comprising 30% or less is

seen to mitigate the negative stock price reaction during the two-day announcement period (Muhtaseb & Philippatos 1991). These findings are consistent with both the agency theory and the changes in management shareholdings signalling hypotheses.

Wruck (1989) posits private placements can result in an external blockholder emerging who monitors management (acting as a governance mechanism), and can therefore increase firm value. It may reduce ex ante investor scepticism regarding the pricing of the offer (Eckbo, Masulis & Norli 2007). Cross-sectional analysis suggests the announcement effect of a private placement is strongly correlated with the resulting change in ownership concentration. Both Wruck (1989) and Morck, Shleifer & Vishny (1988) find ownership effects are less prevalent in smaller firms. On the other hand, Hauser, Kraizberg & Dahan (2003) note small public firms are often managed by majority owners in the US and elsewhere, and focus on the incentive majority insiders have to engage in insider trading around SEOs. They find a strong post-announcement share price change due to insider trading, suggesting majority insiders purchase shares before the offering to preserve and/or increase their ownership of the firm. An interesting question therefore is to what extent do management ownership signals still matter to the market where high risk SEOs are effectively underwritten by government tax incentives.

3.2.3.8 Underwriter participation

Underwriting securities reduces information asymmetry and adds value to investors' assessment of the securities. Helou & Park (2001) and Pandes (2010) find underwriter reputation reduces the magnitude of the negative share price reaction to the announcement, thereby confirming investment bankers perform a signalling role.

As discussed above, differences in underwriter certification arise from differences in the equity offering terms, which can mitigate or strengthen the weight of certification in regard to the respective offering and influence the share price reaction (Slovin, Sushka & Lai 2000). Underwriter certification increases in the UK and France since the offering terms are fixed (leading to a positive share price reaction), while a -3% share price reaction is recorded in the US where announcements can be adjusted and therefore underwriter certification is mitigated (Gajewski & Ginglinger 2002; Slovin, Sushka & Lai 2000). This suggests the signal quality of underwriter certification only works to partially reveal the issuing firm's actual quality (Eckbo, Masulis & Norli 2007).

The provision of the FTS program enables the Canadian Government to function in a manner that has some similarities to an underwriter. For example, the Canadian Government provides implicit assurance to investors that MEE investment downside associated with governance issues (such as moral hazard and adverse selection concerns due to high information asymmetry) is limited,[82] while providing tax effective exposure to exploration project upside. This may be reason to expect higher returns from FTS issuers compared to other forms of SEO.

Ferguson & Pundrich (2015) study market reactions to mandatory specialist non-financial assurance. They argue the assurance role of Competent Persons when making public disclosures of non-financial information under regulatory codes (such as the JORC Code and NI43-101) resembles the assurance role of auditors of financial reports. Under these disclosure framework codes, Competent Persons[83] are responsible for the

[82] Downsides are limited through specifications on the use of proceeds and requirements around the timeframe within which eligible expenditures must be incurred and renounced to investors. They are also limited through tax benefits including accelerated tax deductions up to the amount invested, federal and provincial tax credits, and concessional capital gains tax treatment.

[83] Under NI43-101 (Canadian Securities Administrators 2011), Competent Persons must be 'an individual who is an engineer or geoscientist with at least five years of experience in mineral exploration, mine development or operation or mineral project assessment, or any combination of these, has

quality and accuracy of technical disclosures of mining companies. Weak evidence is found suggesting specialist assurance is positively associated with market reactions around reserve disclosures.

The use of non-GAAP performance measures is widespread, and companies increasingly believe investors make decisions and evaluate firm performance on a range of non-GAAP measures (Arena, Catuogno & Moscariello 2020). Such measures could have low information content and possibly mislead investors (Anderson, Hobson & Sommerfeldt 2022). Anderson, Hobson & Sommerfeldt (2022) investigate the effect of auditing non-GAAP performance measures by studying whether an audit of such measures creates a false sense of assurance from an investor's perspective. They find investors appropriately use informative non-GAAP measures in their investment-related decisions irrespective of whether the measure is audited, and disregard less informative non-GAAP measures when they are not audited. However, investors inappropriately use less informative non-GAAP measures when they are audited. This suggests the auditing of non-GAAP measures signals more than what is intended to investors, resulting in investors perceiving uninformative (but audited) non-GAAP measures to be useful in their investment decisions.

Applying this to the FTS context, the MEEs which issue FTS are subject to mandatory disclosure requirements under NI43-101 which must be endorsed by a Competent Person. Since there is only weak evidence suggesting specialist assurance is positively associated with market reactions around reserve disclosures (Ferguson & Pundrich 2015), most likely due to the backward-looking nature of resource and reserve disclosures, and investors sometimes inappropriately use less informative non-GAAP

experience relevant to the subject matter of the mineral project, and is in good standing with a professional association' (McCombe 2007).

measures simply because they are audited (Anderson, Hobson & Sommerfeldt 2022), the FTS framework bridges the gap between investor hesitancy and specialist assurance around mineral disclosures. While disclosures of mineral resource and reserves information are mandatory, investors being less informed regarding scientific and technical aspects of the exploration industry, or unfamiliar with the technical terminology, may contribute to their reluctance to invest in MEEs. As such, the Canadian Government effectively co-invests in FTS issues by providing a framework which mitigates MEE investment downside, while providing tax effective exposure to exploration project upside.

3.2.3.9 Firm size

Wu, Wang & Yao (2005) examine the Hong Kong setting and document a significant firm size effect, whereby the smaller the size of the issuing firm, the more positive the announcement effect of the new issue. This is seen amongst public and private equity placements. From the private placement perspective, the positive announcement effect could be driven by the reduction in information asymmetry around the new investment opportunities being pursued by small firms. Denis (1994) also notes a significantly positive relationship between firm growth opportunities and announcement effects driven by a subset of small, young, high growth firms examined in a sample of US industrial firms.

3.3 Hypothesis

FTS are an industry-specific equity issuance which carry tax benefits that distinguish them from other types of equity offerings. Like other types of SEO, FTS offerings are

announced ahead of their issuance.[84] This presents an opportunity to compare the FTS announcement effect with that of other SEOs.[85]

FTS are largely issued by way of private placements which are documented in the extant literature to be associated with a positive announcement effects (Cronqvist & Nilsson 2005; Hertzel et al. 2002; Hertzel & Smith 1993; Kang & Stulz 1996; Krishnamurthy et al. 2005; Slovin, Sushka & Lai 2000; Wu, Wang & Yao 2005). In contrast, FTS are specific to firms which exhibit high levels of information asymmetry. This is due to several factors, including extended project lifecycles, the low probability of exploration success, difficulties and lengthy timeframes involved in estimating the size and extent of a mineral deposit if it were to be discovered, and managers holding superior private technical information about mineral projects unknown to shareholders who may or may not have a sound technical understanding of the industry. High information asymmetry is typically associated with negative SEO announcement effects. Thus, the information asymmetry argument is a reason to expect negative market reactions to FTS announcements (Leland & Pyle 1977). FTS are also subject to minimum holding or escrow periods, which a study specific to the US setting finds reduces investor returns the longer holding periods extend (Lim, Schwert & Weisbach 2021).[86]

In light of these competing theoretical and empirical perspectives, FTS carry entitlements to several tax benefits for FTS holders which render FTS a relatively de-

[84] FTS announcements are made, on average, one month before issue (refer Table 2.3).
[85] While the share price reaction captures the reaction of existing shareholders (rather than prospective shareholders) to an FTS announcement, it is reasonable to assume many prospective FTS holders are existing shareholders in a given firm. This is because Canadian rules regarding private placements mandate firms can only offer private placements to sophisticated investors and/or existing shareholders (Bennett Jones 2017).
[86] Maynes & Pandes (2011) study the impact of legislation enacted in Canada on 30 November 2001 which reduced private placement resale restrictions. While their results find that shortening the holding period on common shares purchased via private placements reduced the likelihood of smaller firms with greater information asymmetry issuing common stock via private placements, it should be noted the sample under investigation excludes FTS deals. As such, it is improbable that the findings apply to FTS issuing firms, especially as the majority of FTS deals are issued via private placement and confined to the extractive industries.

risked (thus attractive) investment in a high-risk environment. These tax benefits include accelerated tax deductions up to the amount invested, federal and provincial tax credits, and concessional capital gains tax treatment upon the disposal of FTS; effectively forming government co-investment in the mineral exploration activities undertaken. While the literature documents mixed evidence on the impact of the stated use of proceeds on the share price reaction, it is a legal requirement that proceeds from FTS deals be devoted to exploration activities within a strictly specified timeframe.[87] A firm's commitment to the FTS program in light of these requirements signals to the market that the firm is committed to exploration activities within a reasonable timeframe. Despite the fact MEEs are heavily reliant on equity financing, thus have limited incentive to misuse proceeds and incur reputational damage, these features of the Canadian Government's framework provide implicit assurance for investors (especially those which are less technically adept regarding the exploration industry) that the downsides of significant moral hazard and information asymmetry for MEEs are limited, while investors gain from any exploration project upside. This is further supported by the incurrence of penalties and liabilities to indemnify investors should a firm fail to adhere to the FTS use of proceeds and timeframe requirements (in addition to reputational damage).[88]

As exploration is a value-generating activity which increases the prospects of a mineral discovery, there are good reasons to expect higher returns from FTS issuers upon the announcement of an FTS deal compared to a common equity deal. However, there are also information asymmetry arguments to suggest negative market reactions to any type

[87] Firms have 24 months to incur eligible exploration expenditures, however this has been extended by a further 12 months on account of the impact of COVID-19 on the operations of the mining sector. The extension applies to FTS deals issued after February 2018 and before 2021.

[88] On the other hand, MEEs which misuse and/or squander SEO proceeds will eventually incur reputational damage, thus making it difficult to raise equity financing in the future (Bui, Ferguson & Lam 2021). Penalties and investor indemnification would not apply.

of equity announcement made by MEEs. In contrast, there are tax benefits and use of proceeds arguments to suggest positive market reactions to FTS announcements over and above other SEO announcements. Thus, H1 is expressed as follows:

H1: *The share price reaction to the announcement of FTS deals is greater than other SEO announcements by the same firms*

Testing this hypothesis will improve understanding of how the market reacts to FTS deals, and represents an opportunity to extend the coverage of the SEO and PIPEs literature to include FTS. This is important as the market reaction is a likely indicator of how well the market perceives the FTS program as a means of incentivising high risk exploration investment, and whether the tax benefits available to investors are perceived to alleviate underlying risks involved in investing in MEEs. Furthermore, testing this hypothesis provides an opportunity to facilitate comparisons with other types of SEO deals given the unique tax benefits offered by FTS and their underlying government endorsement.

3.4 Research design

This chapter will compare the share price reaction to the announcement of an FTS issue to that of other SEO announcements by analysing abnormal returns over the announcement window of Day -3 to 0. Following Brown, Ferguson & Stone (2008) and Gajewski & Ginglinger (2002), abnormal returns are measured by calculating the difference between the (log of the) stock return and the (log of the) market return over the announcement window, where the market return is calculated using the TSX Venture Composite Index. The abnormal return is calculated as follows:

$$AR = \ln(P_t/P_{t*}) - \ln(M_t/M_{t*})$$

Where:

AR = the abnormal stock return

P_t = the price of the stock at time *t*

M_t = the price of the market at time *t*

t* = the estimation period prior to the event window

t = the final day of the event window

The announcement window of Day -3 to 0 is adopted as the dependent variable, while a more standard announcement window of Day -1 to 0 adopted in a number of prior studies (Asquith & Mullins 1986; Brown, Ferguson & Stone 2008; Burton, Lonie & Power 1999; Slovin, Sushka & Lai 2000) is employed in the sensitivity analysis. An estimation period of 100 days prior to the event is employed in this study to allow sufficient estimation of the firm's normal stock performance.[89] This follows studies investigating event study result sensitivity, which indicate results are insensitive to varying estimation windows provided the estimation period is at least 100 days (Armitage 1998; Park 2004).

The magnitude of the abnormal return is regressed on the cross-sectional determinants of abnormal returns, and the model is specified as follows:

$$Return = b_0 + b_1 OfferSize + b_2 FirmSize + b_3 RunUp + b_4 DiscPrem + b_5 FTS + e$$

Variable measurement is as follows:[90]

[89] An extended estimation window is not employed to mitigate sample attrition based on insufficient data availability throughout extended estimation periods.

[90] Continuous variables are winsorised at the 2% level, and the results are not sensitive to winsorisation at the 1% and 3% levels.

The model employs the four-day abnormal return event window (Day -3 to 0) of the equity announcement as the dependent variable (*Return*). Relative offering size (*OfferSize*) is measured as the number of shares to be issued as disclosed in the equity announcement, divided by the number of shares outstanding at the month-end prior to the announcement plus the number of shares to be issued. This is consistent with the general approaches taken by Brown, Ferguson & Stone (2008), Helou & Park (2001) and Asquith & Mullins (1986). Firm size (*FirmSize*) is measured as the natural logarithm of total assets. Share price run up (*RunUp*) is calculated as the cumulative share price return over the 60 trading days prior to the announcement, following Brown, Ferguson & Stone (2008) and Helou & Park (2001). Offer premium (*DiscPrem*) is calculated as the offer price scaled by the firm's average closing price over the five trading days prior to the announcement, minus 1. The explanatory variable of interest identifies FTS issuances (*FTS*) using an indicator variable coded =1 if the deal represents an FTS offering; zero otherwise.

The data relating to FTS deals is obtained from the FTS announcement released to the market. The FTS announcements are manually collected from Factiva based on the sample of FTS deals hand-collected from the financial reports[91] of TSX Venture Exchange (TSXV) listed companies. The announcements are identified by company name and employing search terms which specify FTS deals issued on the TSXV between 2001 and 2019.

All other data is obtained from the S&P Capital IQ database, including data relating to other SEO announcements and data required to calculate abnormal returns. This

[91] Company financial reports are obtained from the SEDAR database. The announcements are subsequently collected from Factiva because the financial reports do not disclose details such as announcement date, director and/or broker participation.

includes daily stock prices, daily values of the TSX Venture Composite Index, and number of outstanding shares.

Table 3.1 reconciles the sample of FTS and other SEO deals subject to market reaction testing and describes the data attrition. An announcement date cannot be determined for 753 deals as the FTS announcement for those deals cannot be located in Factiva records.[92] Insufficient price data is available to calculate share price returns in relation to 672 deals, either within the estimation or event windows. Data is also unavailable with respect to one or more control variables in relation to 776 FTS deals. As such, 3,168 remaining FTS deals are utilised in market reaction tests. In contrast, 10,619 standard SEO deals are reported in the S&P Capital IQ database for the same sample of FTS issuing firms. An announcement date is not recorded for 302 deals and insufficient price data is available for 1,685 deals. Data is also unavailable with respect to one or more control variables in relation to 472 other SEO deals, leaving 8,160 non-FTS deals available for market reaction analysis.

[Insert Table 3.1]

3.5 Results

3.5.1 Descriptive results

Table 3.2 Panel A captures the share price reaction to both FTS and other SEO announcements over various event windows. Over the four-day announcement period (Day -3, 0) there is a mean announcement effect of +1.2% and +1.8% for FTS and other SEO deals respectively, both of which are significant at the $p<0.01$ level using both a *t*-test and Wilcoxon signed-rank test. Comparing these announcement effects using

[92] As the sample of FTS deals are initially hand-collected from the firm financial reports available on the SEDAR database, details such as the announcement date are subsequently obtained from the FTS announcements available on Factiva. Some FTS announcements cannot be located on Factiva, thus the announcement date cannot be determined.

statistical difference tests, the *t*-test reports these results are statistically different at the $p<0.05$ level. A total count positive statistic indicates that 50.7% of FTS deals and 52.0% of other SEO deals report a positive return within this announcement window. These overall positive results suggest announcements made by FTS issuers have positive reactions in a small majority of cases, in contrast to the negative market reactions to SEO announcements previously documented.

The average returns recorded over the other announcement windows report consistent results, although the average returns recorded five days before (Day -5, -2) the FTS and other SEO announcements are not statistically different. These results do not support H1, given the mean excess return for other SEO deals is greater than that of FTS deals announced by the same group of firms.

Table 3.2 Panel B captures the share price reaction to other SEO deals amongst non-FTS issuing firms.[93] Notably, the difference tests conducted between the SEO announcements of non-FTS issuing firms and standard SEO announcements of FTS issuing firms reveal the respective share price reactions are not statistically different. Taken together with the results of Panel A, these results suggest standard SEO deals are more attractive to MEE investors, despite the tax benefits afforded by FTS.

[Insert Table 3.2]

While negative returns are usually observed among firms with high information asymmetry (such as MEEs), these preliminary results are consistent with Hertzel & Smith (1993) who posit that when private placements[94] are announced they imply favourable information regarding the value of the firm (thereby mitigating information

[93] These firms are MEEs also listed on the TSXV, however are not recorded to have ever issued FTS.
[94] 98% of the FTS deals and 99% of the other SEO deals under examination were issued via private placement (refer Table 3.5).

asymmetry). They are consistent with an agency theory interpretation, which predicts a positive share price reaction in the case of successful private placements as it results in increased monitoring of management through blockholders and larger shareholders. This applies to both FTS and other SEO issues in this case. Furthermore, in the FTS context, is also could reflect government endorsement of FTS through tax benefits for FTS subscribers.

Additional analysis of the share price reaction is conducted by sub-industry[95] and is reported in Table 3.3. Amongst FTS deals, the mean excess return for each respective sector within the announcement period (Day -3 to 0) ranges between -9.3% and +2.9% across all sectors. The lowest returns of -9.3% are observed in the Oil & Gas Equipment & Services sector, while the highest returns of +2.9% are observed amongst Former Miners.[96] A similar range can be observed amongst standard SEO deals, where the lowest returns of -10.3% are reported in the Integrated Oil & Gas sector, while the highest returns of +1.4% are reported in the Copper sector. Interestingly, Diversified Metals & Mining is the only sector which recorded statistically different returns between FTS and other SEO deals. Consistent with the results of Table 3.2, the mean excess return of FTS deals in this sector is +1.0%, which is less than the +1.7% reported amongst other SEO deals.

[Insert Table 3.3]

Further analysis of the share price reaction is conducted by firm size quartile and captured in Table 3.4. The mean and median excess returns are mostly positive across all quartiles for both deal types, and generally decrease in firm size. Mean excess returns

[95] Sub-industry classifications are obtained from the S&P Capital IQ database.
[96] Such firms were mining entities at the time of announcing and issuing FTS.

for the smallest firms in the sample are approximately double those of the larger firms, consistent with the firm size effect (Banz 1981; Brown et al. 1983).

Despite the mining industry being one characterised by high information asymmetry, share price reaction is favourable for both FTS and other SEO deals across firms of all sizes. Once again, there does not appear to be a statistical difference between the mean excess returns of FTS deals compared to other SEO deals across quartiles. As noted previously, this could be driven by the fact most FTS and other SEO deals issued by the sample of MEEs are conducted via private placements. Furthermore, in the case of FTS deals, this could be driven by the implicit assurance provided by the favourable tax and use of proceeds arrangements put in place by the Canadian Government under the FTS program. Another potential explanation is the market is responding to project acceleration and underlying geological prospectivity.

[Insert Table 3.4]

Table 3.5 captures the share price reaction and factors associated with announcements with respect to FTS and other SEO deals. Additional sensitivity analyses can be found at Tables 3.6 and 3.7 where these associated factors are examined by sub-industry and firm size quartile.

[Insert Table 3.5]

The mean (median) offering size relative to outstanding issued capital is 27% (12%) for FTS deals, and 33% (20%) for other SEO deals. On average, firms exhibited a +6% share price run up before the FTS announcement date, however the nil median value suggests that for most observations the share price remained constant over the 60 trading days preceding the FTS announcement. The largest run up observed prior to an

FTS announcement is +150%, which is not unusual in the context of MEEs. Similarly, an average run up of +4% is reported before the announcement of other SEO deals.

Anecdotally it is frequently noted that FTS can be issued at a premium on account of the tax benefits they afford the FTS holder, sometimes between 20% to 30% (Pelletier 2012). The descriptive results suggest that FTS announcements within the sample under examination stipulate a mean (median) FTS issue price 11% (11%) higher than the average closing share price prevailing 5 trading days preceding the FTS announcement, consistent with the beneficial tax treatment. Some FTS deals are issued at a discount like other SEOs, with the greatest discount observed being 33%. Amongst the sample of other SEO deals, the mean (median) issue price is 2% (4%) lower than the average closing price prevailing on the 5 trading days preceding the SEO announcement, consistent with the SEO discounting literature.

Descriptive statistics relating to FTS deal characteristics disclosed in FTS announcements are reported in Table 3.5 (namely whether the deal is a private placement and underwriter participation). FTS are issued via private placement in 98% of announcements, while SEOs are issued privately in 99% of announcements.[97] Underwriter participation is specified in 1% of both announcements respectively. These descriptive results are consistent with those reported at Table 2.3 which reports FTS deal characteristics for the entire sample.

The proportion of foreign mineral projects held by firms indicates FTS issuers have, on average, 7% of their project portfolio located outside of Canada. On the other hand, other SEO deals report an average of 16%, which is consistent with FTS program rules

[97] As detailed in Chapter 1, two prospectus exemptions are available in Canada which enable firms to issue equity (including FTS) via private placements. These are the 'accredited investor' exemption (that is, pertaining to sophisticated investors), and the 'existing securityholders' exemption (likened to an entitlement issue).

stipulating that FTS funding must be directed towards domestic Canadian exploration. Product revenues are observed in only 24 FTS and 22 SEO observations, consistent with the sample comprising MEEs.

Table 3.6 reports factors associated with the share price reaction by sub-industry with respect to FTS and other SEO deals. Amongst FTS deals, firms in the Silver and Oil & Gas Equipment & Services sectors make the largest size FTS offerings relative to outstanding shares (42%), closely followed by the Iron Ore sector (37%). Silver firms experience the highest average share price run up of +14% in the 60 trading days leading up to the FTS announcement. Meanwhile, Oil & Gas Equipment & Services firms experience an average negative cumulative share price run down of -36%. Firms across all sectors issue FTS at a premium on average. The greatest average premium is observed in the Oil & Gas Equipment & Services sector (23%), after the substantial share price run down noted previously. The lowest premium (2%) is observed for Silver firms after a substantial share price run up. The highest level of underwriter participation is seen in the Gold sector (3%), however underwriters may not necessarily be required in the FTS setting as the Canadian Government's tax framework in relation to FTS effectively co-invests in each placement.

Amongst other SEO deals, the largest offering sizes are reported amongst firms in the Oil & Gas Equipment & Services (59%) and Iron Ore (38%) sectors. This is consistent with the above. Across most sectors SEOs are issued at a discount on average, which is consistent with the SEO discounting literature. The greatest discount is observed in the Iron Ore sector (4%).

[Insert Table 3.6]

Table 3.7 reviews factors associated with the share price reaction by firm size quartile. Offering size appears to have an inverse relationship with firm size for FTS and other SEO deals, which is expected assuming smaller firms have less shares outstanding. Share price run up generally increases with firm size, and the smallest firms are reported as having a negative average cumulative share price run up over the 60 days prior to the FTS announcement. The FTS issue price premium increases with firm size, with the largest firms applying a premium almost double that of the smallest firms. Since all funds raised from FTS deals are directed to exploration expenditure, this suggests larger firms raise greater amounts as they have better or more prospective projects. Conversely, the SEO discount decreases with firm size, where the smallest firms apply a discount which is on average triple that of the largest firms.

[Insert Table 3.7]

Table 3.8 presents the correlation matrix including all variables employed in the multivariate cross-sectional model of returns. The greatest correlation (0.36, significant at the $p<0.01$ level) is identified between offer premium and FTS, which suggests FTS deals are issued at higher premiums (consistent with the results reported in Table 3.5). A negative correlation (-0.115, significant at the $p<0.01$ level) is identified between return and share price run up, which shows some support for the information asymmetry hypothesis and share price run up arguments (Gajewski & Ginglinger 2002; Helou & Park 2001; Masulis & Korwar 1986). That is, investors perceive managers will only issue equity when they believe the current share price is overvalued. There is little to no risk of multicollinearity in the cross-sectional regression owing to the variance inflation factors being in the range of 1.02 to 1.19.

[Insert Table 3.8]

3.5.2 Cross-sectional results

Table 3.9 presents various cross-sectional models of factors affecting the share price reaction to the FTS announcement (Day -3 to 0). Model 1 features all explanatory variables[98] and has an Adjusted R^2 of 4.62%, with the F-statistic significant at the $p<0.01$ level. *OfferSize* is positive and significant at the $p<0.01$ level, indicating equity offers which comprise a larger proportion of shares outstanding are associated with a larger share price reaction. *FirmSize* is negative and significant at the $p<0.01$ level, suggesting the share price reaction is greater amongst smaller firms. This is consistent with the size effect documented in the literature, and the descriptive results reported in Table 3.4. *RunUp* is also negative and significant at the $p<0.01$ level and consistent with the prior literature (Gajewski & Ginglinger 2002; Helou & Park 2001; Masulis & Korwar 1986). *DiscPrem* is positive and significant at the $p<0.01$ level, indicating that premium equity issues are associated with a positive share price reaction. *FTS* is negative and significant at the $p<0.01$ level. This result suggests the market responds less favourably to FTS issues in comparison to other SEO deals, consistent with the results reported in Table 3.2. Model 2 tests the sensitivity of these results and employs the two-day abnormal return event window (Day -1 to 0) as the dependent variable. It can be seen the results are robust to a change in the dependent variable.

[Insert Table 3.9]

These results do not support H1. With reference to Attachment 3.3, MEEs in the exploration and scoping and feasibility phases are largely equity financed, and only later in the feasibility phase do some MEEs obtain seed loans to finance feasibility studies (Ferguson & Lam 2021). From the perspective of the pecking order theory

[98] *Mining*, *Private* and *Underwriter* are excluded from the model (despite being included in the descriptive data) as mining firms comprise 97% of the observations, and private placements comprise 98% of the observations. Underwritten deals only comprise 1% of the deals in the sample under study.

(Myers & Majluf 1984), Canadian MEEs are without sources of internal funding (that is, retained earnings) and are unable to obtain debt (which would typically be obtained from private sources) until the development phase. Thus, MEEs rely on external financing by way of equity issues such as FTS (and other SEOs) to fund exploration activities. By enabling the FTS program, the Canadian Government effectively co-invests in mineral exploration activities in Canada by mitigating investor losses in the likely event the exploration activity of the MEE is unsuccessful. Despite this, the results suggest the share price reaction is greater for other SEO deals than FTS deals.

Since other SEO deals do not offer the tax benefits of FTS deals nor mandate use of proceeds requirements, this result suggests the participation of informed investors in private SEO placements (absent the benefits afforded by FTS) signals positive information about the firm to the market, which leads to a substantial reduction in information asymmetry and subsequently larger positive market reaction. Furthermore, these results could be explained by the focus of FTS on domestic exploration given FTS proceeds must be utilised on Canadian exploration activities. From these results, it appears investors favour offshore exploration activities which could be of higher grades (indicating greater prospectivity). MEEs can finance offshore exploration activities through other SEO deals, but not FTS. To further investigate this possibility, a control variable for project locations is examined in the sensitivity analysis.

Table 3.10 tabulates the variance inflation factors for each of the models. The results indicate a low risk of multicollinearity.

[Insert Table 3.10]

Table 3.11 reports the results of various sensitivity tests. The results show primary results in Table 3.9 are robust to alternative samples, depicting similar Adjusted R^2

magnitudes and all coefficients maintaining the same sign. The first model includes a control variable capturing the ratio of foreign projects amongst the firm's project portfolio. The coefficient of *ForeignProjects* is negative but insignificant, which neither supports nor rules out the potential explanation that investors may favour offshore exploration activities which cannot be funded via FTS. The second and third models seek to rule out whether simultaneous FTS and other SEO announcements inflate the share price reaction (noise).[99] Both controlling for and excluding simultaneous announcements presents results which are consistent with the primary model. The fourth model reports results for Diversified Metals & Mining firms only, since this is the only sector with a statistically different share price reaction between FTS and other SEO deals (refer Table 3.3). The results are consistent with the primary model with a higher explanatory power of 5.15%. Since Diversified Metals & Mining firms comprise the majority of the sample, the higher Adjusted R^2 is unsurprising given other sectors such as Former Miner and Oil & Gas Equipment & Services may not, strictly speaking, be focused mining companies.[100]

[Insert Table 3.11]

3.6 Conclusion

This chapter examines firm share price reactions to announcements of FTS placements in comparison to other seasoned equity announcements by the same firms. Mean excess returns of +1.2% and +1.8% are observed amongst FTS and other SEO deals respectively over the event window (Day -3 to 0). Specifically, FTS deals are observed to have a negative and significant association with announcement returns, suggesting

[99] Simultaneous announcements are defined as FTS and other SEO announcements by the same firm which occur within seven days of each other.
[100] Untabulated results confirm the reported results hold when Former Miners and Oil & Gas Equipment & Services firms are excluded from the sample.

the market reacts more favourably to the announcement of other SEO deals. Furthermore, firm size and share price run up demonstrate a negative and significant relationship to announcement returns, while there is a positive and significant association with offer size and the extent of the issuance premium. These results are consistent with prior research (Denis 1994; Gajewski & Ginglinger 2002; Helou & Park 2001; Masulis & Korwar 1986; Wu, Wang & Yao 2005). The largest FTS returns are observed amongst the smallest quartile of firms (based on total assets), and firms belonging to the Gold and Oil & Gas Exploration and Production industry sectors.

These findings contribute to the SEO literature by comparing the market reaction to the announcement of FTS issues to that of other SEO deals. The FTS setting is unique as it features tax and use of proceeds requirements that effectively see the Canadian Government mitigate high levels of information asymmetry. By and large, it can be seen FTS generally do not conform to the pattern of negative market reactions observed amongst most types of SEOs across many jurisdictions.

The pertinent features which distinguish FTS from other common equity SEO issues are the array of tax benefits they offer and the use of proceeds requirements. However these findings suggest the market does not react as favourably to FTS, which mitigate some of the risk involved in MEE investments, compared to the announcement of other SEO deals where capital raisings can be used to fund a wider range of activities, including offshore exploration. One possible explanation for this finding is that the participation of informed investors in private SEO placements (absent the benefits afforded by FTS) leads to a substantial reduction in information asymmetry and subsequently larger positive market reaction. Furthermore, MEEs may prefer to employ FTS when raising capital for higher risk (or lower quality) projects, where the additional risk is mitigated by the tax benefits FTS offer investors.

A limitation of this chapter is that the extent of the tax benefits afforded by FTS is likely to be dependent on the marginal tax rates of individual FTS investors, which is unobservable and thus cannot be measured. Another limitation is that it is unclear what role commodity prices play in FTS and other SEO performance, although it is highly likely these are at least partially controlled for through the *RunUp* variable. A final limitation is the previously acknowledged difficulty in controlling for geological prospectivity amongst MEEs.

Avenues for future research in this area could include implementing alternative measures of abnormal return to determine whether consistent results are obtained when employing alternative benchmarks, and investigating long-run performance implications of FTS issuers.

3.7 Appendix

Table 3.1: Reconciliation of equity issuances subject to the share price reaction analysis

Selection criteria	FTS deals	Other SEO deals
Number of deals available during the period 2001 to 2019	5,369	10,619
Less: deals where announcement date is unknown	(753)	(302)
Less: deals with insufficient price data to measure returns	(672)	(1,685)
Less: deals where data is unavailable for one or more control variable	(776)	(472)
Total number of deals subject to share price reaction analysis	3,168	8,160

Table 3.2: Share price reaction to the FTS and other SEO announcements, 2001-2019

	FTS statistics						Other SEO statistics						Difference tests	
Announce. window (Day 0)	**N**	**Mean excess return**	**t-test**	**Wilcox. signed-rank test**	**% pos.**	**% neg.**	**N**	**Mean excess return**	**t-test**	**Wilcox. signed-rank test**	**% pos.**	**% neg.**	**t-test**	**Wilcox. rank-sum test**
(-5, -2)	3,951	0.008	3.65***	20.01***	50.6%	49.4%	8,160	0.008	7.00***	2.15**	48.5%	51.5%	-0.24	0.78
(-3, 0)	3,951	0.012	4.78***	8.81***	50.7%	49.3%	8,160	0.018	11.59***	6.13***	52.0%	48.0%	-2.34**	-1.48
(-1, 0)	3,951	0.006	3.78***	0.80	50.3%	49.7%	8,160	0.014	10.14***	5.64***	51.8%	48.2%	-3.05***	-2.05**
(-1, 1)	3,951	0.007	3.79***	1.32	49.8%	50.2%	8,160	0.019	12.23***	6.82***	51.6%	48.4%	-4.20***	-2.89***
(1, 4)	3,951	0.003	1.50	10.28***	46.5%	53.5%	8,160	0.012	8.81***	2.64***	48.9%	51.1%	-3.70***	-3.22***

*, **, *** indicates significance at the 10%, 5% and 1% level on a two-tailed test

Table 3.3: Share price reaction to FTS and other SEO announcements (Day -3 to 0) by sub-industry, 2001-2019

	FTS deals			Other SEO deals			Difference tests	
Sub-industry	**N**	**Mean excess return**	**Median excess return**	**N**	**Mean excess return**	**Median excess return**	**t-test**	**Wilcoxon rank-sum test**
Coal & Consumable Fuels	130	0.014	-0.001	142	0.021	-0.000	-0.485	-0.508
Copper	34	0.015	0.004	86	0.033	0.014	-0.559	-0.702
Diversified Metals & Mining	2,270	0.010	-0.001	4,594	0.017	0.002	-2.067**	-1.891*
Gold	1,044	0.016	0.003	2,103	0.020	0.003	-0.687	0.050
Integrated Oil & Gas	0	NA	NA	2	-0.103	-0.103	NA	NA
Oil & Gas Equipment & Services	5	-0.093	-0.138	7	-0.065	-0.026	-0.521	-0.745
Oil & Gas Exploration & Production	125	0.018	0.014	352	0.023	0.002	-0.372	0.989
Precious Metals & Gemstones	243	0.002	-0.001	529	0.007	0.001	-0.546	0.140
Silver	22	0.009	0.006	46	-0.002	0.001	0.392	0.243
Iron Ore	6	-0.004	-0.006	22	0.000	-0.016	-0.102	0.616
Former Miners	72	0.029	0.010	277	0.031	0.005	-0.072	0.375
Total	3,951	0.012	0.001	8,160	0.018	0.002	-2.343**	1.477

Table 3.4: Share price reaction to FTS and other SEO announcements (Day -3 to 0) by size quartile, 2001-2019

	FTS deals			Other SEO deals			Difference tests	
Size quartile (based on total assets)	**N**	**Mean excess return**	**Median excess return**	**N**	**Mean excess return**	**Median excess return**	**t-test**	**Wilcoxon signed-rank test**
Quartile 1	806	0.020	0.002	2,204	0.027	0.003	-1.218	-0.971
Quartile 2	938	0.016	0.003	2,070	0.019	0.003	-0.602	-0.037
Quartile 3	1,074	0.006	0.000	1,934	0.011	-0.000	-1.056	-0.157
Quartile 4	1,058	0.008	-0.002	1,950	0.012	0.003	-0.934	-1.246
Total	3,951	0.012	0.001	8,160	0.018	0.002	-2.343**	1.477

Table 3.5: Share price reaction and associated factors (Day -3 to 0), 2001-2019

	FTS deals								Other SEO deals							
Factors	**N**	**Mean**	**Med.**	**SD**	**Min.**	**Max.**	**Skew.**	**Kurt.**	**N**	**Mean**	**Med.**	**SD**	**Min.**	**Max.**	**Skew.**	**Kurt.**
Return	3,951	0.01	0.00	0.12	-0.23	0.39	0.74	4.36	8,160	0.02	0.00	0.14	-0.28	0.43	0.73	4.30
OfferSize	3,866	0.27	0.12	0.29	0.01	0.97	1.11	2.94	7,923	0.33	0.20	0.31	0.00	0.98	0.79	2.23
FirmSize	3,876	15.84	15.12	1.58	10.76	17.86	-0.57	2.97	8,158	15.83	14.85	1.76	10.28	17.97	-0.45	2.86
Total assets (C$000)	3,876	7,593	3,693	1,120	47	57,000	2.75	11.46	8,158	7,487	2,814	1,250	29	63,600	2.94	11.98
RunUp	3,934	0.06	0.00	0.44	-0.68	1.50	1.06	4.65	8,085	0.04	0.00	0.46	-0.72	1.50	1.01	4.42
DiscPrem	3,448	0.11	0.11	0.18	-0.33	0.54	-0.14	2.99	6,660	-0.02	-0.04	0.17	-0.30	0.55	0.81	3.51
Miner	3,951	0.97	1.00	0.18	0.00	1.00	-5.24	28.43	8,160	0.96	1.00	0.21	0.00	1.00	-4.43	20.65
Private	3,951	0.98	1.00	0.15	0.00	1.00	-6.29	40.51	8,160	0.99	1.00	0.12	0.00	1.00	-8.24	68.97
Underwriter	3,951	0.01	0.00	0.11	0.00	1.00	8.54	73.99	8,160	0.01	0.00	0.11	0.00	1.00	8.91	80.43
Product revenue (C$000)	24	6,383	2,800	9,039	100	32,000	1.94	6.03	22	6,264	5,250	7,549	100	32,000	1.94	7.17

Variable definitions can be found at Attachment 3.1.

Table 3.6: Associated factors (mean) by sub-industry, 2001-2019

	FTS deals						Other SEO deals					
Sub-industry	**OfferSize**	**FirmSize**	**RunUp**	**DiscPrem**	**Private**	**Under.**	**OfferSize**	**FirmSize**	**RunUp**	**DiscPrem**	**Private**	**Under.**
Coal & Consumable Fuels	0.21	15.11	0.12	0.06	1.00	0.02	0.28	15.05	0.05	-0.02	0.97	0.03
Copper	0.26	14.74	-0.01	0.08	1.00	0.00	0.25	14.59	0.03	0.00	1.00	0.00
Diversified Metals & Mining	0.26	14.80	0.06	0.12	0.98	0.01	0.32	14.60	0.03	-0.01	0.99	0.01
Gold	0.27	14.98	0.05	0.12	0.96	0.03	0.35	14.66	0.04	-0.02	0.99	0.02
Integrated Oil & Gas	NA	NA	NA	NA	NA	NA	0.08	17.97	0.52	-0.03	1.00	0.00
Oil & Gas Equipment & Services	0.42	14.69	-0.36	0.23	1.00	0.00	0.59	14.16	-0.07	0.04	1.00	0.00
Oil & Gas Exploration & Production	0.27	15.29	0.00	0.06	0.95	0.02	0.34	14.94	0.20	0.01	0.89	0.03
Precious Metals & Gemstones	0.27	14.98	0.10	0.07	0.97	0.00	0.32	14.69	0.06	-0.02	0.99	0.02
Silver	0.42	15.84	0.14	0.02	1.00	0.00	0.14	16.54	0.10	-0.03	1.00	0.00
Iron Ore	0.37	14.08	-0.04	0.12	1.00	0.00	0.38	15.61	0.21	-0.04	1.00	0.00
Former Miners	0.29	14.31	-0.04	0.08	0.99	0.00	0.38	14.22	0.04	-0.01	0.98	0.02
Total	0.27	14.91	0.06	0.11	0.98	0.01	0.33	15.83	0.04	-0.02	0.99	0.01

Variable definitions can be found at Attachment 3.1.

Table 3.7: Associated factors (mean) by size quartile, 2001-2019

	FTS deals						Other SEO deals					
Size quartile	**OfferSize**	**FirmSize**	**RunUp**	**DiscPrem**	**Private**	**Under.**	**OfferSize**	**FirmSize**	**RunUp**	**DiscPrem**	**Private**	**Under.**
Quartile 1	0.32	12.67	-0.01	0.07	0.97	0.00	0.42	12.35	0.02	-0.03	1.00	0.00
Quartile 2	0.27	14.54	0.05	0.11	0.99	0.00	0.36	14.37	0.01	-0.02	0.99	0.01
Quartile 3	0.25	15.57	0.08	0.12	0.98	0.01	0.26	14.42	0.04	-0.01	0.99	0.01
Quartile 4	0.23	16.76	0.10	0.14	0.96	0.04	0.26	16.77	0.08	-0.01	0.96	0.04
Total	0.27	14.91	0.06	0.11	0.98	0.01	0.33	15.83	0.04	-0.02	0.99	0.01

Variable definitions can be found at Attachment 3.1.

Table 3.8: Correlation matrix

Variables	Return	OfferSize	FirmSize	RunUp	DiscPrem	FTS
Return	1.000					
OfferSize	0.042 ***	1.000				
FirmSize	-0.057 ***	-0.164 ***	1.000			
RunUp	-0.115 ***	0.047 ***	0.068 ***	1.000		
DiscPrem	0.125 ***	-0.144 ***	0.084 ***	0.119 ***	1.000	
FTS	-0.03 ***	-0.077 ***	0.053 ***	0.021 **	0.360 ***	1.000

Variable definitions can be found at Attachment 3.1.

Table 3.9: Cross-sectional regression models of factors affecting share price reaction

Factors	**Predicted sign**	**Model 1** CAR (-3, 0)	**Model 2** CAR (-1, 0)
Intercept		0.069***	0.066***
		(0.012)	*(0.010)*
OfferSize	?	0.026***	0.016***
		(0.004)	*(0.004)*
FirmSize	-	-0.004***	-0.004***
		(0.001)	*(0.001)*
RunUp	-	-0.040***	-0.015***
		(0.003)	*(0.003)*
DiscPrem	+	0.130***	0.097***
		(0.008)	*(0.007)*
FTS	+	-0.024***	-0.020***
		(0.003)	*(0.010)*
N		9,533	9,533
F-value		93.35***	54.35***
Adjusted R^2		4.62%	2.72%

Standard errors are reported below the coefficients.
Variable definitions can be found at Attachment 3.1.

Table 3.10: Variance inflation factors

Factors	**Model 1** CAR (-3, 0)	**Model 2** CAR (-1, 0)
OfferSize	1.05	1.05
FirmSize	1.04	1.04
RunUp	1.02	1.02
DiscPrem	1.19	1.19
FTS	1.15	1.15
Mean variance inflation factor	1.09	1.09

Table 3.11: Additional testing

Factors	Predicted sign	**CAR (-3, 0)** Foreign projects	**CAR (-3, 0)** Control for simultaneous announcements	**CAR (-3, 0)** Simultaneous announcements excl.	**CAR (-3, 0)** Diversified Metals & Mining
Intercept		0.056***	0.069***	0.050***	0.073***
		(0.015)	*(0.012)*	*(0.014)*	*(0.016)*
OfferSize	?	0.032***	0.026***	0.029***	0.025***
		(0.007)	*(0.004)*	*(0.005)*	*(0.006)*
FirmSize	-	-0.003***	-0.004***	-0.003***	-0.004***
		(0.001)	*(0.001)*	*(0.001)*	*(0.001)*
RunUp	-	-0.040***	-0.040***	-0.043***	-0.043***
		(0.004)	*(0.003)*	*(0.004)*	*(0.004)*
DiscPrem	+	0.150***	0.130***	0.129***	0.134***
		(0.010)	*(0.008)*	*(0.009)*	*(0.010)*
FTS	+	-0.024***	-0.023***	-0.025***	-0.023***
		(0.004)	*(0.003)*	*(0.004)*	*(0.004)*
ForeignProjects	+	-0.003			
		(0.006)			
SimultAnnounce	?		*-0.002*		
			(0.003)		
N		5,762	9,533	6,397	5,403
F-value		55.38***	77.87***	62.63***	59.61***
Adjusted R^2		5.36%	4.62%	4.60%	5.15%

Standard errors are reported below the coefficients.
Variable definitions can be found at Attachment 3.1.

Attachment 3.1: Variable measurements

Variable	Measurement
Return	= mean excess return over the announcement period (Day -3 to 0)
OfferSize	= anticipated number of shares issued divided by the number of shares outstanding prior to the issue plus the anticipated number of shares
FirmSize	= natural logarithm of total assets*
RunUp	= cumulative share price return over the last 60 trading days before the announcement
DiscPrem	= issue price divided by the average closing price prevailing on the 5 days prior the announcement, minus 1
FTS	= 1 if the deal pertains to an FTS issuance; zero otherwise
SimultAnnounce	= 1 if another SEO deal was announced within seven days of the announcement date; zero otherwise
Miner	= 1 if the firm is classified as a miner; zero otherwise
Private	= 1 if a private placement deal is indicated in the announcement; zero otherwise
Underwriter	= 1 if an underwritten deal is indicated in the announcement; zero otherwise

* Values taken at the balance date prior to FTS announcement

Attachment 3.2: Example of an FTS announcement[101]

Palladium One Mining Announces $4.35 Million Non-Brokered Private Placement of Flow-Through Shares

Financing

TSX.V: PDM
www.palladiumoneinc.com
Mr. Derrick Weyrauch reports:

Toronto, Ontario--(Newsfile Corp. - December 3, 2021) - **Palladium One Mining Inc.** (TSXV: PDM) (FSE: 7N11) (OTCQB: NKORF) (the "**Company**" or "**Palladium One")** is pleased to announce a non-brokered private placement (the "**Offering**") of 15,000,000 flow-through common shares of the Company (the "**Flow-Through Shares**") to be sold to accredited investors at a price of C$0.29 per Flow-Through Share for gross proceeds of C$4,350,000. Desjardins Capital Markets, are acting as a finder in connection with the Offering, while Sprott Capital Partners LP and Echelon Capital Markets are acting as financial advisors.

The Company will use an amount equal to the gross proceeds received by the Company from the sale of the Flow-Through Shares to incur eligible "Canadian exploration expenses" that qualify as "flow-through mining expenditures" as both terms are defined in the Income Tax Act (Canada) (the "**Qualifying Expenditures**") on or before December 31, 2022 (or such other period as may be permissible under applicable tax legislation), and to renounce all the Qualifying Expenditures in favour of the subscribers of the Flow-Through Shares effective on or before December 31, 2021. If the Qualifying Expenditures are reduced by the Canada Revenue Agency, the Company will indemnify each subscriber of Flow-Through Shares for any additional taxes payable by such subscriber as a result of the Company's failure to renounce the Qualifying Expenditures.

Finders' fees will be payable in cash and common share warrants issuable in connection with the Offering, subject to, and in accordance with, the policies of the TSX Venture Exchange. All Flow-Through Shares issued pursuant to the Offering and any common shares issuable from any common share warrants will be subject to a hold period of four months and one day in accordance with applicable securities laws.

Closing of the Offering is subject to certain customary conditions including, but not limited to, the receipt of all required regulatory approvals, including the approval of the TSX Venture Exchange. Closing of the Offering is expected to occur on or about December 16, 2021.

The securities referred to in this news release have not been, nor will they be, registered under the United States Securities Act of 1933, as amended, and may not be offered or sold within the United States or to, or for the account or benefit of, U.S. persons absent U.S. registration or an applicable exemption from the U.S. registration requirements. This press release does not constitute an offer for sale of securities, nor a solicitation for offers to buy any securities in the United States, nor in any other jurisdiction in which such offer, solicitation or sale would be unlawful. Any public offering of securities in the United States must be made by means of a prospectus containing detailed information about the company and management, as well as financial statements.

About Palladium One

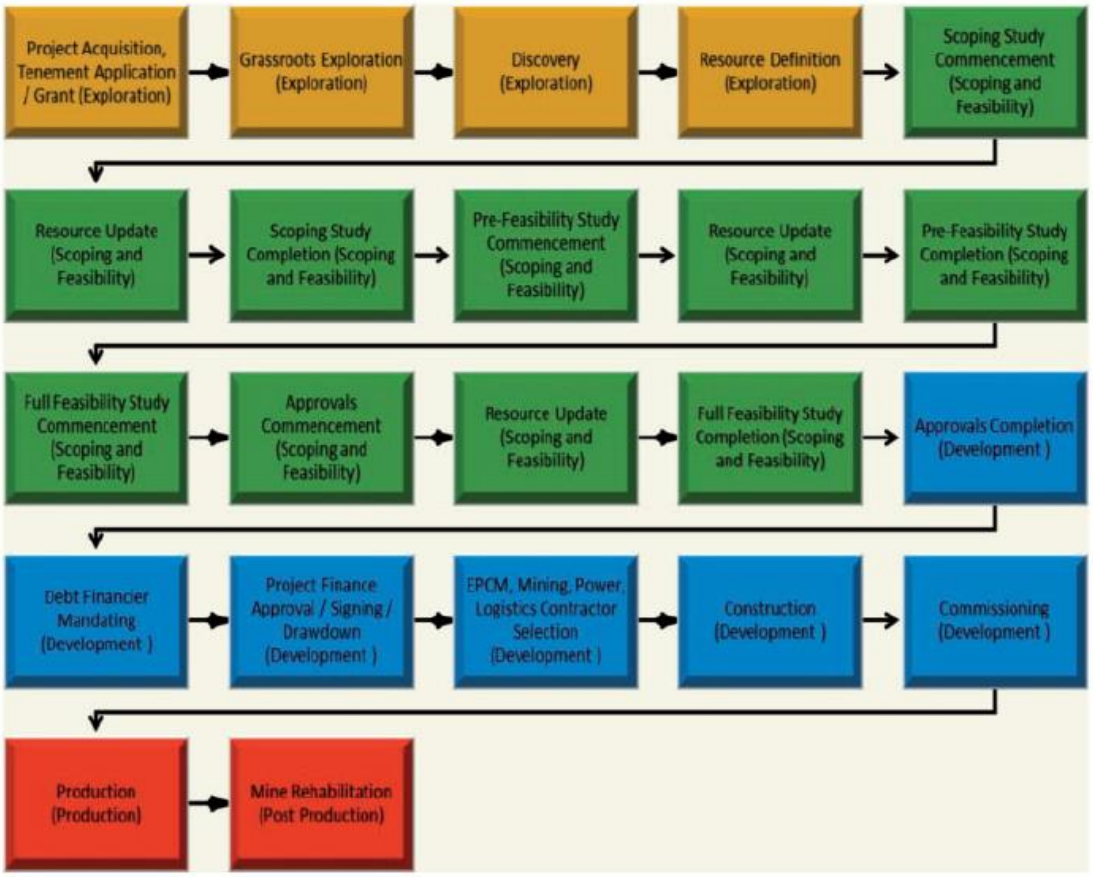
Palladium One Mining Inc. (TSXV: PDM) is focused on discovering environmentally and socially conscious **Metals for Green Transportation**. A Canadian mineral exploration and development company, Palladium One is targeting district scale, platinum-group-element (PGE)-copper-nickel deposits in leading mining jurisdictions. Its flagship project is the Läntinen Koillismaa (LK) Project in north-central Finland, which is ranked by the Fraser Institute as one of the world's top countries for mineral exploration and development. LK is a PGE-copper-nickel project that has existing Mineral Resources. PDM's second project is the 2020 Discovery of the Year Award winning Tyko Project, a high-grade sulphide, copper-nickel project located in Canada. Follow Palladium One on LinkedIn, Twitter, and at www.palladiumone.com.

ON BEHALF OF THE BOARD

"Derrick Weyrauch"
President & CEO, Director

[101] Palladium One Mining Inc. (2021)

Attachment 3.3: Mine project lifecycle stages[102]



[102] Ferguson & Lam (2021)

Attachment 3.4: JORC Code extract[103]

Reporting Terminology

12. Public Reports dealing with Exploration Results, Mineral Resources or Ore Reserves must only use the terms set out in Figure 1.

Figure 1 sets out the framework for classifying tonnage and grade estimates to reflect different levels of geological confidence and different degrees of technical and economic evaluation. Mineral Resources can be estimated on the basis of geoscientific information with some input from other disciplines. Ore Reserves, which are a modified sub-set of the Indicated and Measured Mineral Resources (shown within the dashed outline in Figure 1), require consideration of the Modifying Factors affecting extraction, and should in most instances be estimated with input from a range of disciplines.

'Modifying Factors' are considerations used to convert Mineral Resources to Ore Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

Measured Mineral Resources may be converted to either Proved Ore Reserves or Probable Ore Reserves. The Competent Person may convert Measured Mineral Resources to Probable Ore Reserves because of uncertainties associated with some or all of the Modifying Factors which are taken into account in the conversion from Mineral Resources to Ore Reserves. This relationship is shown by the broken arrow in Figure 1. Although the trend of the broken arrow includes a vertical component, it does not, in this instance, imply a reduction in the level of geological knowledge or confidence. In such a situation these Modifying Factors should be fully explained.

Refer also to the guidelines to Clause 32.

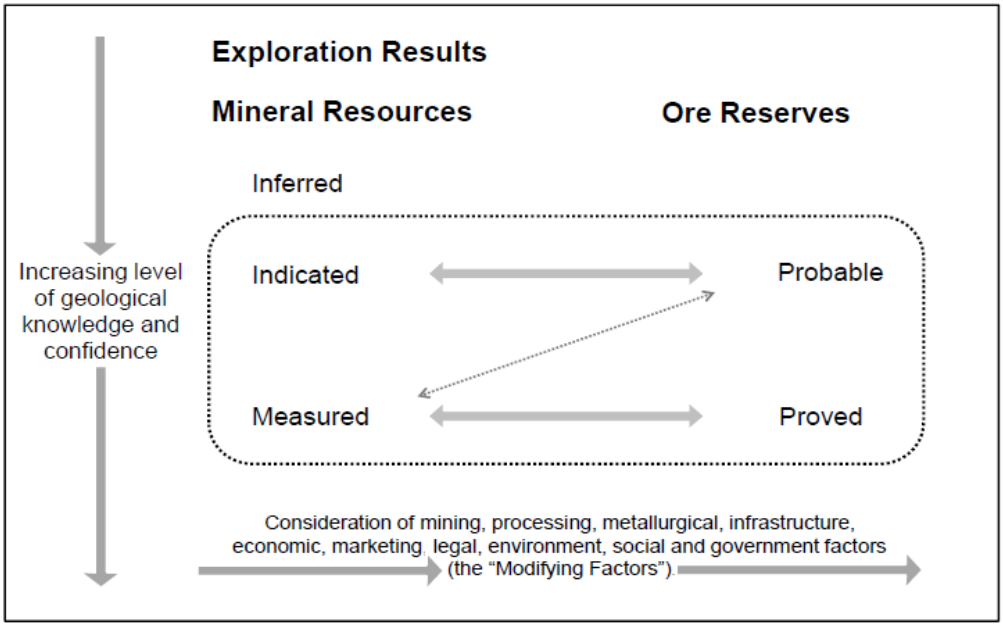


Figure 1 General relationship between Exploration Results, Mineral Resources and Ore Reserves.

[103] Joint Ore Reserves Committee (2012)

Reporting General

13. Public Reports concerning a company's Exploration Results, Mineral Resources or Ore Reserves must include a description of the style and nature of the mineralisation.

14. A company must disclose all relevant information concerning Exploration Results, Mineral Resources or Ore Reserves that could materially influence the economic value of those Exploration Results, Mineral Resources or Ore Reserves to the company. A company must promptly report any material changes in its Mineral Resources or Ore Reserves.

15. Companies must review and publically report their Mineral Resources and Ore Reserves annually. The annual review date must be nominated by the Company in its Public Reports of Mineral Resources and Ore Reserves and the effective date of each Mineral Resource and Ore Reserve statement must be shown. The Company must discuss any material changes to previously reported Mineral Resources and Ore Reserves at the time of publishing updated Mineral Resources and Ore Reserves.

16. Throughout the Code, if appropriate, 'quality' may be substituted for 'grade' and 'volume' may be substituted for 'tonnage'. (Refer to Appendix 1 Generic Terms and Equivalents.)

17. It is recognised that it is common practice for a company to comment on and discuss its exploration in terms of target size and type. However, any such comment in a Public Report must comply with the following requirements.

    An Exploration Target is a statement or estimate of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnes and a range of grade (or quality), relates to mineralisation for which there has been insufficient exploration to estimate a Mineral Resource.

    Any such information relating to an Exploration Target must be expressed so that it cannot be misrepresented or misconstrued as an estimate of a Mineral Resource or Ore Reserve. The terms Resource or Reserve must not be used in this context. In any statement referring to potential quantity and grade of the target, these must both be expressed as ranges and must include:

- a detailed explanation of the basis for the statement, including specific description of the level of exploration activity already completed, and
- a clarification statement within the same paragraph as the first reference of the Exploration Target in the Public Report, stating that the potential quantity and grade is conceptual in nature, that there has been insufficient exploration to estimate a Mineral Resource and that it is uncertain if further exploration will result in the estimation of a Mineral Resource.

Given the level of uncertainty surrounding the supporting data, an Exploration Target tonnage or grade must not be reported as a 'headline statement' in a Public Report.

If a Public Report includes an Exploration Target the proposed exploration activities designed to test the validity of the exploration target must be detailed and the timeframe within which those activities are expected to be completed must be specified.

If an Exploration Target is shown pictorially (for instance as cross sections or maps) or with a graph, it must be accompanied by text that meets the requirements above.

A Public Report that includes an Exploration Target must be accompanied by a Competent Person statement taking responsibility for the form and context in which the Exploration Target appears.

All disclosures of an Exploration Target must clarify whether the target is based on actual Exploration Results or on proposed exploration programmes. Where the Exploration Target statement includes information relating to ranges of tonnages and grades these must be represented as approximations. The explanatory text must include a description of the process used to determine the grade and tonnage ranges used to describe the Exploration Target.

> *For an Exploration Target based on Exploration Results, a summary of the relevant exploration data available and the nature of the results should also be stated, including a disclosure of the current drill hole or sampling spacing and relevant plans or sections. In any subsequent upgraded or modified statements on the Exploration Target, the Competent Person should discuss any material changes to potential scale or quality arising from completed exploration activities.*

4.0 AUDIT PRICING AND FLOW-THROUGH SHARE ISSUANCE

4.1 Introduction

This chapter examines the audit pricing implications of flow-through share (FTS) issuance. In this chapter, two competing explanations for the impact of FTS on audit pricing are considered. Firstly, arguments are presented suggesting FTS is associated with audit complexity and greater compliance risk. This suggests that firms issuing FTS would be associated with higher audit fees. Alternatively, the notion that the Canadian Government partially co-invests in companies issuing FTS suggests mineral exploration entities (MEEs) in the high-risk mining exploration industry will have lower risk and thus lower audit fees. This chapter explores these competing effects in terms of potential audit pricing implications.

The chapter is structured as follows. Firstly, the background and motivation for this chapter and contribution to the literature are discussed in Sections 4.1.1 and 4.1.2 respectively. Secondly, a review of the prior audit fee and auditor specialisation literature is provided in Section 4.2. This is undertaken on the basis there is evidence of industry specialisation in the Canadian MEE context. In Section 4.3 testable hypotheses are discussed with respect to FTS issuance and audit fees, the engagement of Big 4 and industry specialist auditors and auditor office-level specialisation. This is followed by an overview of the research methodology employed and variable measurement in Section 4.4. Results are discussed in Section 4.5 and Section 4.6 concludes.

4.1.1 Motivation

There is limited prior academic work published on differing aspects of FTS. The previous chapters of this thesis examine the features of FTS deals and the characteristics of firms issuing them, the determinants of the FTS issuance premium and the market

response to the announcement of FTS deals. The objective of this chapter is to understand the audit pricing implications for FTS issuers.

This chapter is motivated firstly by a notable paucity of Canadian audit pricing literature. Prior Canadian audit pricing studies applying variants of the Simunic (1980) model include Chung & Lindsay (1988) and Anderson & Zeghal (1994). Subsequently Canada has adopted IFRS reporting standards, which can impact both accounting and auditing practise. More recent Canadian audit pricing studies focus on other firm characteristics and how they impact the pricing of audit services, such as control, ownership structure and board independence (Bozec & Dia 2017; Bozec & Bozec 2013; Khalil, Magnan & Cohen 2008). According to Basioudis & Francis (2007), it is important to conduct audit pricing research across various jurisdictions, as prior empirical evidence demonstrates the determinants of audit fees are not uniform across countries. The purpose of this chapter is to consider the role FTS issuance plays in the pricing of audit services, given FTS are a unique and economically significant form of capital raising amongst MEEs in Canada which are required to be disclosed in the firm's audited financial statements.

The first argument in relation to the impact of FTS on audit pricing relates to complexity and compliance. Increased complexity is introduced into the audit process when the auditee issues FTS. An example of the journal entries to account for FTS can be found in Attachment 4.1. The process of capturing transactions associated with a single FTS deal involves: (i) the issuance of common shares and the recognition of a liability to sell tax deductions in future; (ii) capitalisation of relevant expenditures; and (iii) a reduction in the liability associated with the sale of tax deductions, and recognition of a deferred tax liability with respect to eligible expenditures. Evidently this process is more complex than common equity issuances, and sample FTS issuers issue an average

of 1.6 FTS deals per year (refer Figure 2.3).[104] The FTS process compounds audit complexity and auditor workload including verifying the correct reporting and assuring compliance of FTS-related transactions.

Furthermore, MEEs have unique characteristics and can be likened to biotechnology research and development (R&D) firms due to their long project life cycles, high levels of information asymmetry[105] and high risk profile (Ferguson & Lam 2021). MEEs can be regarded as R&D firms due to the extensive research, scoping and testing involved in locating and determining the commercial viability of a mineral resource. These activities result in the generation of intangible assets[106] (deferred exploration and evaluation expenditure) and MEEs must choose whether to capitalise or expense exploration and evaluation expenditure. The relevant accounting standard applicable in Canada is IFRS 6 *Exploration for and Evaluation of Mineral Resources*, and it is anecdotally noted that the standard allows flexibility in treatment by MEEs owing to its industry-specific nature and carve-outs from the conceptual framework (Ferguson, Kean & Pundrich 2021).[107] Furthermore, at the time of writing this thesis there is

[104] The largest number of FTS deals made by a single sample firm in a given year was 14, occurring in 2010.

[105] Substantially high levels of information asymmetry arise due to the agency relationship between shareholders and management in the MEE setting, where managers hold superior private technical information about the firm's mineral projects unknown to shareholders and the market. The information problem is exacerbated by the highly technical and specialised nature of mineral exploration, which most shareholders are unlikely to be trained in.

[106] Expected agency costs increase where assets become less tangible, and growth options and asset specificity increase (Gompers 1995).

[107] The March 2017 issue of the BDO Australia (2017) accounting newsletter features a 'Blind Freddy' segment on common errors associated with accounting for exploration and evaluation assets under AASB 6 *Exploration for and Evaluation of Mineral Resources*. Some of these errors include (but are not limited to): incorrectly believing expenditure is within the scope of AASB 6; using a unit of account larger than an area of interest; capitalising exploration and evaluation where the rights to tenure of the area of interest are not current, or before the entity has obtained rights to explore a specific area; capitalising expenditure in the prospecting phase; and capitalising general overheads.
The IFRS equivalent to AASB 6 applies in Canada (IFRS 6), therefore it is possible Canadian firms (especially small firms like MEEs) are likely to make similar errors in their own financial reporting, thus increasing the workload of auditors when verifying the financial statements.

discussion around the possibility of changes to IFRS 6. In particular, the International Accounting Standards Board (2022, p. 1) suggests in its September 2022 workplan that:

"The IASB is exploring whether to develop requirements or guidance to improve an entity's disclosures about its exploration and evaluation expenditure and activities. The IASB is also exploring whether to remove the temporary status of IFRS 6 Exploration for and Evaluation of Mineral Resources. The IASB is researching what information users of financial statements need about exploration and evaluation expenditure and activities, why they do not currently get that information, and the costs and benefits of requiring an entity to provide that information".

The topicality of the current workflow of the IASB related to the extractive industries highlights the importance of research in this area. The audit complexity associated with FTS is exacerbated by the fact IFRSs do not specifically address accounting for FTS, or the tax-related considerations associated with such transactions. Instead, FTS issuers require compliance with specific Canadian Government requirements for FTS issuers. Prior Canadian accounting standards dealt with FTS in Section 3465 *Income Taxes* and EIC-146 *Flow-Through Shares* (Mining Industry Task Force on IFRSs 2015), however Canada adopted IFRS for public companies from financial years commencing on or after 1 January 2011. According to Neilsson & Erasmus (2012) of PricewaterhouseCoopers, since IFRS provides no specific guidance on accounting for FTS, the consensus amongst accounting practitioners is to follow the US GAAP methodology which involves splitting the proceeds from the sale of FTS between the sale of the common shares issued and the sale of tax benefits. Given the lack of standardisation around the correct way to account for FTS from a financial reporting and compliance perspective, auditors are exposed to additional risk when accepting an

audit engagement of an MEE firm which issues FTS. Simunic (1980) suggests that greater liability loss exposure (risk) results in higher audit fees.

In summary, by examining Canadian audit pricing in the MEE context, a better understanding can be obtained of the impact of FTS deals. In this thesis, it is argued the issuance of FTS adds further complexity and compliance risk to audit engagements, thus results in higher audit fees.

4.1.2 Contribution

As previously mentioned, there are limited examples of published empirical research which examine FTS and there is a paucity in the audit pricing literature featuring the Canadian setting. Canadian audit fee studies based on the Simunic (1980) model include Chung & Lindsay (1988) and Anderson & Zeghal (1994). However, both of these studies, like Simunic (1980), rely on questionnaire responses for data collection purposes, indicating the samples may be subject to a degree of selection bias. Secondly, each of these prior Canadian studies has a limited sampling period (usually one year). As such, this chapter builds upon these prior Canadian audit fee studies by providing audit pricing evidence based on a large sample of Canadian MEEs over a 15-year period.

The sample is drawn from the TSX Venture Exchange (TSXV), which is a second-tier exchange specifically designed for microcap venture firms too small to list on the Toronto Stock Exchange (TSX). The composition of the TSXV has a mining firm focus (approximately 68%). As such, the sample utilised in this chapter of the thesis represents a homogenous group of microcap MEEs drawn from the TSXV exchange which has not featured in published research to date. The MEE setting is an interesting one for an audit fee investigation given firstly the economic significance of the mining sector in Canada and the high information asymmetry of the setting. Secondly, the Canadian Government effectively co-invests in mining projects where FTS deals are

used for capital raising. This is because MEEs represent the potential generation of significant positive externalities through high tax revenues in the event a mining exploration project is successful. Given prior empirical evidence in the audit pricing literature demonstrates that factors which influence the determination of audit pricing are not uniform across jurisdictions, this chapter contributes to the extant audit pricing literature by updating previous findings in the Canadian jurisdiction. In addition, this thesis investigates whether FTS issuance plays a role in audit pricing and does so while focusing on a homogenous sample of microcap MEEs which comprise much of the broader Canadian mining sector in terms of sample numbers.

This chapter will also assist policy-makers, practitioners and academics to better understand the broader implications of the FTS program from a compliance and reporting perspective. Given the homogeneous nature and large sample of MEEs, there is reason to believe auditor industry specialisation may be relevant in audit pricing for MEEs, owing to the increased compliance costs for FTS issuing firms over and above the mandatory reporting requirements enforced by the Canada Revenue Agency (CRA).

4.2 Background literature

4.2.1 Origins of the audit pricing model

The theoretical and empirical basis for the audit pricing model is provided by Simunic (1980). Simunic (1980) is a supply side model of audit fees, where the model aims to identify the determinants of supplier liability loss exposure (risk) to audit pricing. Simunic (1980) argues the factors giving rise to increased liability loss exposure include the size of the auditee, the complexity of the auditee's operations and lastly the risk of the auditee. These factors are considered to contribute to the auditor's risk exposure and impounded into the pricing of audit services. The empirical proxies for each of these audit fee determinants developed by Simunic have formed the foundation of subsequent

audit fee research across a variety of jurisdictions since, including Australia, Canada, the United States, the United Kingdom and New Zealand.

DeAngelo (1981) subsequently examines auditor size and its relationship with audit quality, which is defined as the combined likelihood of an auditor identifying a breach in the auditee's accounting system and that breach actually being reported. DeAngelo posits that large audit firms undertake substantial investments in audit technology, provide more extensive staff training, and outlay greater expenditure on advertising their services. These investments translate to a higher degree of reputational capital at stake for large audit firms, and thus greater perceived audit quality. Furthermore, DeAngelo suggests the advantages of audit incumbency (such as the elimination of client start-up/induction costs for audit firms) incentivise large auditors to provide higher quality audits.

4.2.2 Prior Canadian audit pricing studies

There are few examples of empirical Canadian audit pricing studies, and this paucity of prior research partially motivates this chapter. The first Canadian study of audit fees was undertaken by Chung & Lindsay (1988) who adopt the Simunic (1980) model and implement minor modifications. Data for this study was obtained through a questionnaire distributed to 714 companies[108] in 1981, of which there were 233 respondents. Ordinary least squares (OLS) regression models were applied in the study, and the main test produced an explanatory power of 61.2% after the removal of outliers. Factors associated with audit client complexity and areas associated with audit difficulty returned positive and significant results, namely number of subsidiaries, proportion of foreign subsidiaries, and the portion receivables and inventory comprise

[108] All firms contacted were incorporated in Canada and listed on either the Toronto or Montreal Stock Exchanges as of 31 December 1980.

of the auditee's total assets respectively.[109] A variable controlling for the length of time an auditor had been engaged by the auditee returned a negative and insignificant result, suggesting the incumbency advantage noted by DeAngelo (1981), or benefits of client learning, could not be attributed to lower audit fees in the Canadian setting.

Anderson & Zeghal (1994) provide further Canadian audit pricing evidence with an emphasis on audit product differentiation. Data for this study was obtained through a questionnaire distributed to 716 companies, from which 243 usable replies were received. The final sample comprised 374 observations from 172 companies across the years 1980, 1982 and 1984.[110] Consistent with prior research, significant relationships were observed between audit fees and auditee size and complexity. A significantly positive relationship between internal and external audit costs was also identified, in contrast to the findings of Chung & Lindsay (1988). With respect to product differentiation, the findings indicate the presence of competition and quality differentiation throughout the market, and economies of scale in the market of large audit clients.

More recently, Khalil, Magnan & Cohen (2008) investigate whether audit fees vary with the distinction between cash flow rights and control rights arising from a dual-class share structure present amongst some listed Canadian companies. Dual-class shares exist in firms which have issued capital of two or more classes of shares, each with varying levels of voting rights. Khalil, Magnan & Cohen (2008) posit that dual-class shares impact audit pricing through their impact on the supply of audit services. They predict audit firms charge higher (lower) fees to clients with a dual-class share

[109] These results are consistent with other papers examining the US setting at the time, including Simunic (1980) and Maher et al. (1992).
[110] These years were chosen because the professional conduct standards in Canada relating to advertising and fee tenders on audits were significantly relaxed between 1979 and 1981, providing an opportunity to examine whether audit pricing subsequently became more competitive.

structure compared to a single-class structure depending on whether the dual-class shares increase (decrease) audit risk and/or auditor business risk. The sample is drawn from firms listed on the TSX Composite Index in 2004. The results primarily support the entrenchment perspective, which suggests that dual-class shares increase audit risk and auditor business risk because they entrench large shareholders and reduce the quality of financial reporting. Audit fees are positively associated with the discrepancy between cash flow and control rights arising from dual-class share structures, suggesting auditors may conduct a wider scope audit and/or charge a premium fee to such clients.[111] Further, a positive relationship between audit fees and corporate governance quality is observed.

A more recent study extends that of Khalil, Magnan & Cohen (2008). Bozec & Bozec (2013) examine the impact of excess control on the pricing of audit services. Using a sample of 242 Canadian firms listed on the S&P/TSX Composite Index over the period 2002-2008, a positive relationship is identified between the dominant shareholders' excess control and audit fees while controlling for levels of ownership concentration and family ownership respectively. The results suggest auditors charge higher fees in the presence of excess control in Canada. Furthermore, while family firms are typically charged higher audit fees than non-family firms, no statistical relationship is identified between family firms and audit fees when the excess control effect is controlled for in the model.

Bozec & Dia (2017) study the relationship between board independence and audit fees with respect to the ownership structure of the firm. The sample period spans 2002-2008

[111] These results contrast with those of Lobanova et al. (2020) who conduct a similar study in the US setting, finding that dual-class firms are associated with lower audit fees compared to single-class firms. The authors attribute these differing results to differences in the legal and regulatory environments between the US and Canada.

and employs a sample of Canadian public companies listed on the S&P/TSX Composite Index. Overall results demonstrate a positive and significant relationship between board independence and audit fees when ownership is concentrated to a dominant/controlling shareholder. This is consistent with demand-side drivers of audit fees and the expropriation effect hypothesis. The greater the disparity between the ultimate owner's voting and cash flow rights, the more prominent the relationship between board independence and audit fees.

4.2.3 Audit product differentiation

Prior research has documented product differentiation as a factor determining audit pricing. In the auditing context, product differentiation takes the form of variations in audit quality. In an early Australian study, Francis (1984) posits that if shareholders demand greater monitoring of management due to agency concerns, a higher quality auditor is a potential solution. Francis (1984) applies an OLS regression model and splits the sample on median total assets to test this explanation among both large and small audit client segments. The sample partition into small and large client segments is consistent with the Simunic (1980) assertion that price competition prevails in the market for small client audits. The results do not indicate any structural differences between the models applied to the large and small clients, with the large auditor dummy variable (coded =1 if the auditor is a Big 8 firm) showing positive and significant results across both partitions of client size. These findings suggest Big 8 audit firms charge premiums to both large and small clients, consistent with the notion that Big 8 firms offer a differentiated, higher quality auditing service.

Francis & Stokes (1986) replicate the audit pricing model of Francis (1984) in an effort to address the contrasting results pertaining to audit fee premiums reported in Simunic (1980) compared to Francis (1984). Francis & Stokes (1986) expand the sample utilised

in Francis (1984) and identify Big 8 premiums in the small audit client segment only, evidencing Big 8 product differentiation in the segment. The inability to identify Big 8 premiums in the large client segment is attributed to the diseconomies of scale (and associated increase in prices) of small audit firms, subsequently offsetting the product differentiation premiums which would be attributable to the large auditors (Ferguson 2005).

4.2.4 Auditor industry specialisation

4.2.4.1 Firm-wide, national-level specialisation

Auditors develop industry specialisation through extensive audit experience, rigorous staff training and substantial investments in audit technology (DeBoskey & Jiang 2012). Prior research examines the role of auditor industry specialisation in the determination of audit fees. In this sub-section, auditor specialisation will be discussed at the firm-wide, national-level.

Firm- and industry-specific factors result in cross-sectional differences in demand for monitoring, which impacts demand for industry specialist auditors. Thus, differentiated demand leads to differentiated audit services offered between the Big N accounting firms and non-Big N firms, and industry specialisation amongst Big N firms (Ferguson 2005). In addition to brand name premiums, industry specialists are found to earn a further premium (Casterella et al. 2004; Craswell, Francis & Taylor 1995; Ferguson & Stokes 2002). The literature employs various measures to define industry specialists, including auditors who hold a market share of 10-20% in terms of either clients or fees (Casterella et al. 2004; Craswell, Francis & Taylor 1995; Ferguson & Stokes 2002). Some studies reconfigure the dependant variable and add non-audit service fees to represent fee-bundling by firms. In some cases leadership premiums disappear, suggesting firms take non-audit service fees into consideration when pricing audit

services (Ferguson & Stokes 2002). In other cases when fee-bundling is examined, only then do industry leaders earn a fee premium, indicating firms use audit engagements to up-sell other higher-margin non-audit services (Ferguson, Pundrich & Raftery 2014). Evidence of industry specialist premiums in the small-client sector is mixed: DeFond, Francis & Wong (2000) and Casterella et al. (2004) find evidence supporting the existence of such premiums, while Ferguson & Stokes (2002) and Craswell, Francis & Taylor (1995) do not.

de Fuentes & Sierra (2015) conduct a meta-analysis to evaluate the published data related to the association between auditor industry specialisation and audit fees from 1986 to 2013. Empirical studies following Simunic (1980) are chosen and a sample of 43 studies from a variety of jurisdictions are analysed. The findings suggest auditor industry specialisation has a positive and significant influence on audit fees, and that specialisation allows firms to earn additional premiums. These results are consistent with other meta-analyses conducted by Hay (2013) and Hay, Knechel & Wong (2006). Furthermore, the positive association between industry specialisation and audit fees appears in both small and large audit clienteles.

4.2.4.2 Office-level specialisation

Since audit contracts are established at the office-level and audit quality can vary between offices, a number of studies analyse audit fees from the perspective of the individual office-level. Ferguson, Francis & Stokes (2003) posit that each office within the broader network of brand name firms will retain idiosyncrasies specific to that locality. As such, relevant audit specialisation and expertise is unique relative to the knowledge and experience of the staff in each office (Ferguson 2005). Furthermore, evidence has been reported suggesting that Big 4 audits are conducted at a higher

standard of quality when the engagement office is of a larger size (Choi et al. 2010; Francis & Yu 2009).

Ferguson, Francis & Stokes (2003) examine the leading two audit firms at both the national and local levels in the Australian setting.[112] The results suggest that auditors must be both national and city-level industry leaders in order to generate fee premiums for industry expertise. Such premiums equate to 24%, and suggest firms do not benefit from positive network externalities across offices. Ferguson, Francis & Stokes (2005) reaffirm these results, finding that overall city-specific market leadership also contributes to audit fee determination. As such, there is evidence to support that city-specific leadership is important in differentiating auditors from both an industry and overall perspective. Similar results (but of a smaller magnitude) are observed in the UK setting, where a premium of 12% is identified when the city leader is also the national industry leader (Basioudis & Francis 2007). Further, office-level industry leadership alone accounts for a 19% audit fee premium (Basioudis & Francis 2007). These differing results indicate the effects of national and office-level leadership are not uniform across international jurisdictions.

Other factors associated with individual audit offices are documented to impact audit fees, such as the office size and city-specific labour characteristics. Studying a sample of US firms between 2000 and 2005, Choi et al. (2010) examine how the size of local audit offices influence audit fees and audit quality beyond the firm size at national level. Individual office size is measured by number of audit clients and total audit fees earned by the office, respectively. The results demonstrate a positive association between firm size and both audit quality and fees, even when controlling for national audit firm size

[112] The same model is applied by Reichelt & Wang (2010) in a study of audit quality in the US setting. The find that auditors which are both national and city-level industry specialists produce the highest level of audit quality.

and office-level industry expertise. Consistent results are found in another US study by Francis & Yu (2009), who find larger offices amongst Big 4 firms produce higher quality audits and are more likely to issue going-concern audit reports. Thus, these results support the notion that large local offices provide audit services of superior quality to smaller local offices, and that this quality differentiation is incorporated into audit fees.

Beck, Francis & Gunn (2018) study the influence of city-specific labour characteristics on local audit offices, on the basis that labour is a primary input in the audit process. The specific characteristics examined in this US-based study are the average educational level of the respective city, and the number of accountants in the city relative to the national average, which proxy for the city's human capital. The findings indicate a positive association between audit quality and the average level of education attainment in the city where the engagement office is located, and this is present amongst Big 4 and non-Big 4 firms alike. The results further suggest that companies are more likely to engage a non-Big 4 auditor in cities with higher levels of educational attainment and relatively more accountants, and document higher fees amongst non-Big 4 auditors as city education levels increase. As such, these findings suggest local labour market characteristics influence local audit offices, the quality of audit output and the pricing of audits.

Other studies examine the impact of client reputation on the audit fees of the engagement office, as reputable clients are argued to increase the profile and reputation of the audit firm and thus warrant higher audit fees. Asthana & Kalelkar (2014) employ the S&P 500 Index as a proxy for client reputation[113] and find that audit fees for clients are reduced when they join as an Index constituent. The audit fees subsequently increase

[113] That is, a client's inclusion on the Index represents an improvement in firm reputation.

when the audit client is no longer included on the Index. This pattern is attributed to increased (decreased) firm reporting quality upon their inclusion on (exclusion from) the Index. On the other hand, the study identifies increases in the audit fees of clients not listed on the S&P 500 Index around these events, suggesting auditors extract rents from non-S&P clients based on their prestigious client portfolio. In a similar context, Francis, Mehta & Zhao (2017) find that offices of Big 6 accounting firms which gain (lose) major industry clients experience a 'reputation shock' leading to client gains (losses) within the same industry over the following two years. The results indicate offices that gain (lose) status as city-level industry leaders as a result of the major client gain (loss) significantly increase (decrease) audit fees for clients in the same industry over the next two years.

Contrary to the above-noted results, Goodwin & Wu (2014) find that office-level expertise is generally unimportant when partner expertise is controlled for in the audit fee model. This suggests that office-level expertise might, at least partially, be driven by partner expertise.

4.2.4.3 Partner-level specialisation

In some jurisdictions (such as Australia) individual partner names are disclosed in audit reports, enabling the study of audit market phenomena on the partner-level. Audit fees derived by individual partners might display evidence of scale/discounting effects, or reputation premiums (Ferguson, Pundrich & Raftery 2014). Since audit partners conduct the audit work and personally possess industry expertise, some of the office-level effects on audit pricing might actually be accounted for by expertise at the partner-level (Goodwin & Wu 2014). This is consistent with the findings of Nagy (2014), who finds that both partner- and office-level specialisation are associated with audit fee premiums, but finds no evidence suggesting that partner specialisation has a statistically

different effect on audit fees compared to office-level specialisation. According to Goodwin & Wu (2014) who study the Australian audit market, premiums for partner expertise range between 38-60% amongst Big 4 audit clients, and that city- and national-level expertise loses importance when controlling for levels of partner expertise.

As the output of audit partners would differ in quality, Taylor (2011) conjectures that different audit partners are in a position to charge different levels of fees. This hypothesis is tested by estimating an audit fee model on an Australian sample of public companies in 2005. The results indicate that individual partners earn audit fee premiums and discounts which cannot be explained by auditor brand effects, or the office-level specialisation where they are based. These premiums and discounts are present amongst partners of Big 4 and non-Big 4 firms alike, and partners within the same firm are reported to apply both premiums and discounts. Furthermore, the results indicate that partners who charge premiums have fewer clients than their discount partner counterparts and have a shorter tenure, suggesting they are newer partners building up their reputation and a prestigious client portfolio.

These results are consistent with those of Chi & Chin (2011), who conclude that industry expertise is not homogenous across different audit partners within the same firm in Taiwan. Ferguson, Pundrich & Raftery (2014) also find consistent evidence of partner-scale effects in the Australian market, specifically that lower fees are charged by highly concentrated partners in the leading audit firm.

4.3 Hypotheses

Before Canada adopted IFRS in 2011, Canadian accounting standards dealt with FTS in Section 3465 *Income Taxes* and EIC-146 *Flow-Through Shares* (Mining Industry Task Force on IFRSs 2015). However, IFRS do not specifically address accounting for

FTS and FTS issuing firms rely upon resources and publications released by accounting firms and professional bodies for guidance on accounting for FTS in a manner which is consistent with IFRS. According to anecdotal evidence, in the absence of specific standards and procedures pertaining to accounting for FTS, the consensus amongst accounting practitioners is to follow the US GAAP methodology (that is, to split the proceeds from the sale of FTS between the sale of the common shares issued and the sale of tax benefits) (Neilsson & Erasmus 2012). Given the uncertainty for audit firms from a compliance perspective, auditors are exposed to additional risk when accepting MEE audit engagements issuing FTS. As such, there is a possibility auditors seek compensation for this increased risk by charging higher audit fees.

Furthermore, increased complexity is introduced into the audit process when the auditee issues FTS. The issuance of FTS and the associated reporting of such transactions in the financial statements contributes to audit complexity over and above other factors associated with complexity in the literature (such as the number of subsidiaries and the proportion of those subsidiaries based offshore). Since this process is more complex than a standard common equity issuance, it implies increased onus on auditors to verify the correct reporting of such transactions, which is likely to be factored into audit pricing.

On the other hand, since FTS deals effectively represent co-investment by the Canadian Government, the risks involved in investing in MEEs are mitigated to an extent from an investor perspective. The program framework reduces the risks associated with capital raisings because use of proceeds and expenditure timeframes apply. From an audit perspective, this can reduce the going concern risk and inherent risk of the auditee if the firm is compliant with the framework rules. However, this does not necessarily reduce overall audit complexity due to their unique characteristics, including long

project life cycles, high levels of information asymmetry and high risk profiles (Ferguson & Lam 2021). As such, the risk mitigation provided by the FTS framework is unlikely to reduce the associated audit fees. Thus, H1 is expressed as follows:

H1: *Auditors of MEE clients issuing FTS charge higher audit fees than auditors of MEEs which do not issue FTS*

Prior literature documents a 'brand name' premium associated with the engagement of a Big-*N* auditor across jurisdictions including Australia and the US. Notably, prior Canadian studies do not find conclusive evidence of this, but rather suggest that economies of scale and monopoly pricing effects could be offsetting each other, hence producing an insignificant result (Chung & Lindsay 1988). Since Big 4 firms offer a differentiated audit service supported by a larger employee base and more comprehensive staff training (leading to higher quality audit outcomes), it can be expected that a brand name premium is present in the Canadian setting. Further, Big 4 firms are at the forefront of publishing resources and materials pertaining to FTS compliance, indicating their ability to invest resources into formulating best-practice for handling audits of FTS issuing MEEs. Thus, H2 is expressed as follows:

H2: *There is a positive association between the engagement of a Big 4 auditor by an MEE and audit fees*

In addition to brand name premiums, industry specialists are found to earn further fee premiums (Casterella et al. 2004; Craswell, Francis & Taylor 1995; Ferguson & Stokes 2002). However, evidence of industry specialist premiums in the small-client sector is mixed: Craswell, Francis & Taylor (1995), DeFond, Francis & Wong (2000) and Casterella et al. (2004) find evidence supporting the existence of such premiums, while

Ferguson & Stokes (2002) do not. This is relevant since the sample under investigation in this chapter wholly comprises microcap MEEs listed on the TSXV.

Notwithstanding their size, MEEs have unique characteristics which render them complex to audit compared to other small auditees from other industries. Such characteristics include long project life cycles, high levels of information asymmetry and high risk profiles (Ferguson & Lam 2021). Anecdotal evidence suggests that Canada's IFRS 6[114] accounting standard can be misinterpreted by firms due to its industry-specific nature. In this regard, technical industries like mining require specialised audit professionals to review company financial statements. It would be reasonable to expect that industrial knowledge and expertise adds value to the client in the audit setting, and this would warrant an industry specialist premium. Thus, H3 is expressed as follows:

H3: *There is a positive association between the engagement of an MEE industry specialist auditor and audit fees*

Audit quality can vary between offices of the same firm because relevant audit specialisation and expertise is unique relative to the knowledge and experience of the staff in each office (Beck, Francis & Gunn 2018; Ferguson 2005). In addition to human capital, each office within the broader network of brand name firms will retain idiosyncrasies specific to that locality (Ferguson, Francis & Stokes 2003). In this regard, since audit contracts are established at the office-level, it is likely individual office specialisation is factored into audit pricing. On the one hand, office-level industry leadership has been shown to generate a fee premium owing to the expertise that specific office provides (Basioudis & Francis 2007). In contrast, it would be reasonable

[114] *Exploration for and Evaluation of Mineral Resources*.

to expect that specialisation and concentration at the office-level could precipitate lower costs to clients, since audit processes would be streamlined to cater to specific industry clients. Thus, H4 is expressed as follows:

H4: *There is a negative association between audit office-level specialisation and audit fees*

4.4 Research design

This chapter of the thesis addresses whether audit fee premiums with respect to brand name and industry leadership are observed for Canadian MEEs issuing FTS. An OLS regression model is employed following Ferguson, Pundrich & Raftery (2014) and DeFond, Francis & Wong (2000). The audit fee model includes controls which capture client-specific supply-side audit risk (including auditee size, risk and complexity) (Simunic 1980). The model specification is augmented to include additional industry-related explanatory variables relevant to the MEE and FTS context,[115] specifically exploration expenditure and carry-forward losses.

Following Ferguson, Pundrich & Raftery (2014) the natural logarithm of audit fees is regressed on the cross-sectional determinants of audit fees, and the base model is specified as follows:

$$\begin{aligned} lnAF = b_0 + b_1 lnMarketcap + b_2 lnSubsidiaries + b_3 ForeignSubsidiaries \\ + b_4 lnCash + b_5 Quick + b_6 YE + b_7 lnExplorExp + b_8 lnCFLosses \\ + b_9 DE + b_{10} Opin + b_{11} lnAge + b_{12} Float + b_{13} FTS + b_{14} Big4 \\ + b_{15} FTS * Big4 + e \end{aligned}$$

Variable measurement is as follows:[116]

[115] This is consistent with the approach taken by Fields, Fraser & Wilkins (2004).
[116] Continuous variables are winsorised at the 2% level, and the results are not sensitive to winsorisation at the 1% and 3% levels.

The natural logarithm of audit fees (*lnAF*) is adopted as the dependent variable. The natural logarithm of market capitalisation (*lnMarketcap*) is included to control for firm size and life cycle progression (Ferguson, Pundrich & Raftery 2014).[117] It is expected to be positively associated with audit fees since a greater market capitalisation suggests a firm is able to obtain more equity financing to finance its operations.[118]

Controls for audit complexity are included in the model. The natural logarithm of subsidiaries (*lnSubsidiaries*) captures the number of subsidiaries owned by the MEE, and the foreign proportion of those subsidiaries (*ForeignSubsidiaries*) is calculated by taking the number of offshore subsidiaries and dividing by the total subsidiaries. Both are expected to be positively associated with audit fees since a greater number of subsidiaries increases the complexity of firm operations and reporting.

Controls for audit risk are included in the model. The natural logarithm of cash (*lnCash*) captures the relative cash balance of MEEs. The quick ratio (*Quick*) is calculated by subtracting the value of inventories from current assets, and scaling by current liabilities. Both are predicted to be negatively associated with audit fees, since firms with less cash and quick assets pose greater balance sheet risk and require additional audit effort. Firm solvency (*DE*) is calculated by taking the ratio of non-current liabilities to total assets and is predicted to be positively associated with audit fees, as more audit effort is required where firms are at risk of insolvency.

Industry-specific explanatory variables incorporated into the model include exploration expenditure and carry-forward losses which represent a deferred tax asset. The natural logarithm of exploration expenditure (*lnExplorExp*) captures the relative amount of

[117] Refer to Attachment 3.3 for a diagram which captures mine project lifecycle stages.
[118] Ferguson, Pundrich & Raftery (2014) include the natural logarithm of market capitalisation as MEEs that make significant resource discoveries can have substantial market capitalisation, but less in the way of balance sheet assets.

exploration expenditures incurred by the firm.[119] The natural logarithm of carry-forward losses (*lnCFLosses*) represents deferred tax assets available to the firm, which is expected to be positively associated with audit fees since the magnitude of carry-forward losses will increase auditor workload.

Other explanatory variables relate to firm characteristics, audit information and whether firms issue FTS. The firm's fiscal year-end (*YE*) is captured with an indicator variable coded =1 for a non-31 December year-end (zero otherwise). This is expected to produce a negative coefficient because clients which are audited outside of the busy season (that is, have a year-end other than 31 December) may incur lower audit fees. Firm ownership structure (*Float*) is calculated as the ratio of number of shares held by parties other than insiders and institutional investors to total number of shares outstanding. This is predicted to have a negative association with audit fees, since a greater proportion of firm insider ownership increases the likelihood of misreporting. Firm age (*lnAge*) is calculated as the natural logarithm of the number of years since the firm's incorporation in Canada. This is predicted to produce a negative sign since younger, less mature firms are likely to require additional audit effort and are more risky. Audit opinion (*Opin*) is an indicator variable coded =1 if a qualified audit report was issued (zero otherwise). A qualified audit report increases audit time as discrepancies have been identified in the financial reports, thus audit risk (and fees) are expected to increase. Auditor type (*Big4*) is captured using an indicator variable coded =1 if the auditor is a Big 4 firm (zero otherwise) and is predicted to have a positive relation to audit fees, as Big 4 firms have been demonstrated to apply a brand name premium. FTS issuing firms (*FTS*) are captured with an indicator variable coded =1 (zero otherwise). The key test variable

[119] Other papers such as Ferguson, Pundrich & Raftery (2014) employ capitalised exploration and evaluation expenditures from the balance sheet. However, this data is unavailable from the S&P Capital IQ Database.

captures FTS issuing firms audited by a Big 4 auditor (*FTS*Big4*). It is predicted to have a positive association with audit fees due to a combination of brand name premiums applied by Big 4 firms and increased audit complexity due to the presence of FTS in the firm's capital structure.

Audit-related data pertaining to fees, audit opinion and audit firm are obtained from the Audit Analytics database. The remaining auditee-specific data required to calculate control and explanatory variables is obtained from the S&P Capital IQ database. Specifically, this database is used to obtain market capitalisation data, firm financial statement data, and details pertaining to the number and location of subsidiaries.

Before addressing whether audit fee premiums with respect to brand name and industry leadership are applied to Canadian MEEs which issue FTS (as per the model outlined above), initial testing is conducted to determine whether FTS issuers are subject to higher audit fees than a matched sample of non-FTS issuers. All FTS issuers are drawn from a sample of MEEs listed on the TSXV. The matched control group represent MEEs also listed on the TSXV which have not issued FTS. Matching is conducted each year of the sample period and is based on total assets within a range of 0-3%.

Table 4.1 reconciles the sample of FTS issuers subject to the audit fee analysis and describes the data attrition. Of the 808 FTS issuers within the sample under investigation, audit data was unavailable for 48 firms, and one or more explanatory variables were unavailable for 24 firms. As such, 736 firms are subject to the audit fee analysis.

[Insert Table 4.1]

Table 4.2 reports the sample breakdown of FTS issuers by firm-year and number of auditors. The sample spans the years 2004 to 2018 (inclusive) and contains 7,076 firm-

year observations. In total 154 audit firms are present within the sample throughout the testing period, representing an average of 58.4 unique audit suppliers servicing TSXV-listed MEEs in a given year.

[Insert Table 4.2]

4.5 Results

4.5.1 Descriptive results

Table 4.3 captures provincial auditor descriptive statistics by sub-industry and auditor type for the sample of FTS issuing firms under analysis. Panel A shows audit firms appear to be concentrated in British Columbia across all industry sectors. The only exception observed relates to the Oil & Gas Equipment & Services sector which is concentrated in Ontario. In aggregate, audit firms in British Columbia, Ontario and Quebec service the most FTS issuers across the board, which is consistent with anecdotal evidence suggesting these are the largest mining provinces in Canada in terms of firm headquarters.

Table 4.3 Panel B reports the proportion of FTS issuing clients Big 4 and non-Big 4 auditors service in each province. It appears that Big 4 firms audit most FTS issuers in New Foundland, Nova Scotia and Saskatchewan. Notably these provinces have fewer FTS issuing clients suggesting auditees default to Big 4 firms when engaging an auditor, perhaps owing to their reputation and wanting a 'safe' option. All other provinces are largely serviced by non-Big 4 firms, including those of the three largest mining provinces (British Columbia, Ontario and Quebec). This is consistent with the descriptive statistics reported by Ferguson, Pundrich & Raftery (2014) in their study of the Perth audit market for mining development stage entities (MDSEs), showing Perth MEEs more frequently contract with non-Big 4 audit suppliers.

[Insert Table 4.3]

Table 4.4 reports the distribution of clients and fees amongst the Top 25 auditors by market share.[120] Panel A focuses on the sample of TSXV-listed MEEs which issue FTS, while Panel B focuses on TSXV-listed MEEs which do not. Panel A demonstrates Davidson & Company is the leading auditor for FTS issuers in terms of the number of engagements, audit fees and total fees. The firm has more than double the number of FTS issuing clients compared to second-place PricewaterhouseCoopers (PwC). There is a possibility that Davidson & Company could attract this substantial volume of clients due to their more competitive fee structure, especially as MEEs are typically more budget constrained. In terms of non-audit services, Davidson & Company collect the second most fees after PwC, which could suggest that as the Big 4 leader, PwC is better at bundling non-audit services.

Comparisons can be drawn between these results and those of Ferguson, Pundrich & Raftery (2014). Davidson & Company hold a similar market share (in terms of clients, audit fees and non-audit fees) to BDO Kendalls, which is the industry specialist auditor for MDSEs in Perth. Furthermore, second-place to BDO Kendalls in the Perth market is Ernst & Young (EY), which collects more non-audit service fees from MDSEs than BDO Kendalls. This result is consistent with Big 4 firms being better able to bundle cross-disciplinary services or offering more in the way of non-audit services, the same of which is seen when comparing Davidson & Company to PwC in the Canadian FTS issuer market. All other things being equal, these observations would suggest Davidson & Company is widely known to be an industry specialist amongst FTS issuers.

[120] Market share in this context refers to the percentage of the market serviced by the auditor, measured by the number of engagements.

Table 4.4 Panel B follows the same structure as Panel A but focuses on TSXV-listed MEEs which do not issue FTS. Davidson & Company holds the majority market share by number of engagements, but no longer leads with respect to audit fees and total fees. The rankings of auditors which comprise the Top 25 shifts slightly, with the most notable shift being the increase in ranking of KPMG to third-place by engagement count and audit fees, and second-place by non-audit service fees and total fees.

[Insert Table 4.4]

Table 4.5 contains descriptive statistics pertaining to the model variables and focuses on FTS issuing firms. Panel A reports the variables employed in the model, while Panel B reports associated factors including raw figures before the natural logarithm was taken. Since the sample comprises MEEs, net cash flows from operations is negative with a mean (median) of -C$820,239 (-C$444,419). The mean (median) cash balance is C$1,317,953 (C$321,655), while the mean (median) total assets is C$9,687,118 (C$3,647,914). Most firms own at least two mineral properties, and the average number of properties is 2.78 (14% of which are located outside of Canada). Most firms do not have any subsidiaries, and of those which do, an average of 4% are located outside of Canada. The equity ownership for the majority of firms is held at least 81% in float (that is, at least 81% of the firm's ownership is held by non-institutional and non-insider investors).[121]

The mean (median) total audit fees are C$29,100 (C$24,020), while mean (median) non-audit fees are C$6,562 (C$1,922). 64% of engagements result in a qualified audit opinion, which likely reflects inherent uncertainty on the valuation of exploration and

[121] Ferguson, Pundrich & Raftery (2014) proxy for shareholder structure by measuring the proportion of shares held by the Top 20 shareholders of the sample firms. They report that Top 20 shareholders hold, on average, 56% ownership across the sample, indicating institutional investors do not hold a large proportion of ownership in the sample firms.

evaluation assets. 58% of observations report a non-31 December year-end.[122] Anecdotal evidence suggests most publicly traded Canadian companies use the calendar year as their fiscal year, and the period following the calendar year-end is 'busy season' amongst Canadian accounting firms. As such, there is a possibility clients which are audited outside of the busy season (that is, have a year-end other than 31 December) may incur lower audit fees.

[Insert Table 4.5]

Table 4.6 contains the results of univariate testing conducted to compare the audit fees and factors influencing them for FTS issuing and matched non-FTS issuing firms. The difference tests employed are the parametric *t*-test and the non-parametric Wilcoxon signed-rank test. Matching is conducted each year of the sample period and is based on total assets, where all FTS issuers are matched within a range of 0-3% to a TSXV-listed MEE not reported to issue FTS. Successful matching is demonstrated by the result of the difference tests in relation to total assets (refer Panel B), which confirm the total assets of FTS issuers and their matched non-issuing counterparts are not statistically different.

[Insert Table 4.6]

In all respects FTS issuers are significantly different to matched non-FTS issuers at the $p<0.01$ level.[123] With regard to audit fees and total auditor fees specifically, FTS issuers are subject to lower audit fees than their matched non-FTS issuing counterparts. While this provides preliminary evidence contrary to H1, it does not rule out increased complexity in conducting an audit of FTS issuing firms (due to technicalities associated

[122] In Canada corporations can elect to have a fiscal year-end date of their choosing provided it falls within 53 weeks of their incorporation date. The balance date of the financial statements is set once the first corporate tax return is lodged with the CRA.
[123] The only exception to this is ROI.

with the scheme itself and associated financial reporting), and that this impacts pricing accordingly. Rather, it might suggest non-FTS issuing firms have other characteristics which lend themselves to a greater compliance workload upon the auditor. For example, proxies for audit complexity are the number of projects and subsidiaries. FTS issuers possess more mineral properties than non-FTS issuers (an average of 2.75 relative to 1.18), however a smaller proportion of them are located outside of Canada (an average of 14% relative to 36%). With respect to subsidiaries, FTS issuers have fewer (an average of 0.19 relative to 0.24) and a smaller proportion are located offshore (an average of 4% relative to 6%). These factors could contribute to the lower levels of audit fees for FTS issuers. Furthermore, higher levels of cash holdings, quick assets, long-term liabilities and carry-forward losses could also contribute to higher audit fees for non-FTS issuers, given that verifying this financial information involves more compliance work for auditors.

In terms of audit firm engagement, it appears non-FTS issuers are more likely to engage a Big 4 auditor. According to the prior literature Big 4 auditors charge higher audit fees non-FTS issuers are subject to. On the other hand, FTS issuers are more likely to engage an industry specialist like Davidson & Company than their non-FTS issuing counterparts. Evidently there are significant differences between FTS issuing firms and matched non-issuers from the perspective of audit fees and the factors which influence them. As such, an OLS regression analysis is conducted to control for the impact of these factors on audit fees.

Table 4.7 contains a correlation matrix with results consistent with expectations. Market capitalisation is positively and significantly associated with audit fees, suggesting larger firms are subject to higher audit fees. Cash holdings are positively and significantly associated with market capitalisation, indicating larger firms hold larger amounts of

cash. FTS issuing firms have a negative and significant association with audit fees, consist with the results of Table 4.6. Meanwhile, engagement of a Big 4 auditor is positively and significantly associated with market capitalisation (suggesting Big 4 firms audit larger clients) and audit fees, providing preliminary evidence in support of H2. Engagement of industry specialist Davidson & Company has a negative and significant association with audit fees, suggesting the firm may not charge a specialist premium but rather pass on a specialist discount (contrary to H3).

[Insert Table 4.7]

4.5.2 Cross-sectional results

Table 4.8 presents the matched OLS regression results measuring the impact of various factors on audit fees. Both Models 1 and 2 employ the natural logarithm of audit fees as the dependent variable. Model 1 features an interaction term (*FTS*Big4*) measuring the impact of an FTS issuer engaging a Big 4 auditor, while Model 2 features an interaction term (*FTS*David*) measuring the impact of an FTS issuer engaging Davidson & Company (the market leader as demonstrated in Table 4.4) as auditor, and the corresponding impact on audit fees. Both models return a similar Adjusted R^2 of 36.23% and 31.50% respectively, slightly lower but similar to prior results reported by Ferguson, Pundrich & Raftery (2014) and Chung & Lindsay (1988).

[Insert Table 4.8]

lnMarketcap displays a positive coefficient significant at the $p<0.01$ level in both models, suggesting larger firms are associated with higher audit fees. Complexity control variables (namely *lnSubsidiaries* and *ForeignSubsidiaries*) return results significant at the $p<0.01$ level consistent with the predicted sign. Contrary to expectations, *lnCash* returns a positive and highly significant ($p<0.01$) result under both

models. This suggests firms with more cash on hand require greater audit effort and hence are charged higher audit fees, consistent with Table 4.6. *Opin* and *lnAge* report highly significant (p<0.01) results opposite of the predicted sign. Meanwhile *Quick*, *YE*, *lnCFLosses* and *Float* return significant results consistent with the predicted sign.

The interaction term *FTS*Big4* in Model 1 impacts the interpretation of the *FTS* and *Big4* variables. Firstly, *FTS* returns a negative coefficient significant at the p<0.01 level, suggesting FTS issuers are subject to lower audit fees when *Big4*=0. On the other hand, *Big4* is positive and highly significant (p<0.01), meaning Big 4 auditors charge higher audit fees when *FTS*=0. The interaction term *FTS*Big4* returns a negative and highly significant result, suggesting while Big 4 firms charge premiums for conducting a 'brand name' audit, they do in fact charge relatively lower fees to audit FTS issuing clients. This contradicts H1 and provides preliminary support for H2.

Model 2 is identical to Model 1 but adjusted to assess the impact of a firm engaging Davidson & Company on audit fees. *FTS* returns a negative and significant coefficient at the p<0.01 level, suggesting FTS issuers are subject to higher audit fees when *David*=0. *David* returns a negative and significant coefficient at the p<0.01 level, providing evidence Davidson & Company charges lower audit fees when *FTS*=0. Following this, the interaction term *FTS*David* returns a positive and highly significant (p<0.01) coefficient, indicating the company applies higher fees when auditing FTS issuing clients. This provides some support for H3.

Models 3 and 4 replicate Models 1 and 2 respectively, however the dependent variable employed is the natural logarithm of total auditor fees for audit and non-audit services. The explanatory powers are 38.46% and 32.80% respectively. The purpose of this analysis is to test for the presence of a service bundling premium. The positive and significant (p<0.01) coefficient of *Big4* suggests the Big 4 pricing strategy is to charge

a premium on audits to generate higher fees on bundled services when *FTS*=0. Contrarily, the negative and significant (p<0.01) coefficient of *David* suggests the Davidson & Company strategy is to apply a discount on audits to generate higher fees on bundled services when *FTS*=0. The results of the interaction terms however are consistent with Models 1 and 2. Model 3 indicates that while Big 4 firms generally charge a premium across their services, a service bundling discount can be observed with respect to FTS issuing firms. On the other hand, in Model 4 it appears Davidson & Company applies a statistically significant (p<0.01) service bundling premium to FTS issuers.

Taken together, these results suggest a level of competition exists between Big 4 firms and Davidson & Company (the industry leader). Big 4 firms are observed to make a consistent effort to offer fee discounts to FTS issuers across audit work and total fees. Meanwhile, Davidson & Company has earlier been noted to charge nominally lower fees than the Big 4 firms, but simultaneously appears to be applying a statistically significant premium on account of firm expertise to other Big 4 competitors. It could be the case that Big 4 firms are attempting to expand their market share, and thus resort to discounting their typical fees as a gesture of goodwill to attract additional FTS issuing clients.

Additional testing is conducted on the sub-sample of FTS issuers. Firstly, Table 4.9 reports the audit fee estimation of Big 4 and industry leader premiums.

[Insert Table 4.9]

Model 1 assesses the Big 4 premium and has an Adjusted R^2 of 34.65%, similar to Ferguson, Pundrich & Raftery (2014) and Chung & Lindsay (1988). The *Big4* coefficient is positive and significant at the p<0.01 level. This represents a 35% Big 4

audit fee premium of FTS issuers according to the Simon & Francis (1988) methodology, which corresponds to the fee premium charged by Big 4 firms in the Perth MDSE audit market (Ferguson, Pundrich & Raftery 2014). The size control (*lnMarketcap*) is positive and significant at the $p<0.01$ level. All complexity controls are positive and significant (*lnSubs*, *ForeignSubs* and *DE*), with the exception of *DE*, which suggests there could be economies of scale in auditing financial information on non-current liabilities. On the other hand, *lnCash* returns a positive and significant result suggesting firms with more cash on hand require greater audit effort. Prior studies predict a negative coefficient, however this positive result could be due to the fact FTS issuers with more cash on hand have completed a greater number (or higher value) of FTS deals, and are therefore subject to FTS program rules and expenditure timeframes which may require greater auditing effort. On a potentially related note, *lnExplorExp* (a project development proxy) has a positive but insignificant coefficient, suggesting the level of exploration expenditure does not impact audit fees. This could be due to economies of scale in the audit process when dealing with MEEs.

In Model 2, Model 1 is respecified by replacing the *Big4* indicator variable with *David*, an indicator variable representing Davidson & Company who is the market leader in each year of the sample period. All results from Model 1 hold, however *lnAge* has reduced significance. The models have similar explanatory powers. The *David* indicator variable is positive and highly significant ($p<0.01$) suggesting a fee premium is associated with Davidson & Company when auditing FTS issuers, however the magnitude is much smaller than that of *Big4* in Model 1. This provides support for H2 and H3.

Model 3 modifies the primary model again by splitting Big 4 firms into two categories: *Big4Lead* and *Big4NonLead*. The lead Big 4 firm is PwC as it holds the highest rank in

Table 4.4 Panel A relative to KPMG, EY and Deloitte. A separate dummy variable is included for *David*, suggesting the benchmark comparison group is non-Big 4 clients not audited by Davidson & Company. The resulting Adjusted R^2 is 35.22% and all experimental variables have a positive and highly significant coefficient (*David*, *Big4Lead* and *Big4NonLead*). *Big4NonLead* has the largest coefficient, suggesting these firms charge the highest premium to clients. An *F*-test confirms the coefficients of the auditor experimental variables are statistically different to one another. This suggests the *Big4Lead* (PwC) might exhibit economies of scale when dealing with FTS issuing MEEs compared to its Big 4 counterparts, given the coefficient is notably smaller than that of *Big4NonLead* firms (thus indicating PwC charges a smaller premium comparatively).

Table 4.10 reports the variance inflation factors (VIFs) pertaining to the results tabulated in Table 4.9. The results reveal a low risk of multicollinearity amongst the variables, with mean VIFs of 1.22, 1.20 and 1.20 respectively.

[Insert Table 4.10]

Table 4.11 redefines the dependent variable to the natural logarithm of total auditor fees to test for the presence of a service bundling premium specifically amongst FTS issuers. Once again all experimental variables are positive and significant ($p<0.01$), suggesting industry leader Davidson & Company and Big 4 firms adopt a similar pricing strategy. That is, to charge a premium on audits given the substantially greater amount of audit fees compared to non-audit service fees in the Canadian setting. In untabulated results, adding *lnNAS* (non-audit service fees) to the model yields a positive and significant ($p<0.01$) result, suggesting the supply of non-audit services results in the provision of more audit services.

Comparing these results with those reported by Ferguson, Pundrich & Raftery (2014) in relation to the Perth MDSE audit market, it appears Australian MDSE auditors have a greater tendency to apply service bundling premiums in contrast to Canadian MEE auditors who appear to apply a premium to audit services.[124] The lower proportion of non-audit service fees in Canada could be reflective of reduced bundling incentives compared to the Australian (Perth) setting. Such incentives could be reduced because audit complexity is greater (due to the presence of FTS in the firm capital structure) and litigation risk is higher in Canada, thus warranting higher audit fees. Since Perth MEEs are not exposed to FTS complexity and litigation risk is lower in Australia, there is greater incentive amongst Australian auditors to bundle non-audit services to generate additional fees.

[Insert Table 4.11]

Table 4.12 reports the distribution of FTS issuing audit clients amongst the Top 25 auditor offices (sorted by the engagement count of FTS issuer clients), and reports the level of office-level concentration (*OffConc*).[125] As noted previously, Davidson & Company is the audit market leader servicing FTS issuers in terms of the number of FTS issuing engagements, audit fees and total fees. Interestingly however, the firm's single office in Canada is demonstrated to have an office-level concentration of FTS issuing clients of only 20.01%. The offices of several other audit firms are calculated to have higher levels of office concentration, with the highest being the Val-d'Or office of Grant Thornton at 33.81%. These results suggest that while Davidson & Company is the audit market leader in servicing FTS issuers in terms of the number of FTS issuing client

[124] The ratio of audit fees to non-audit service fees is 5.9:1 in Australia (Ferguson, Pundrich & Raftery 2014), in contrast to 4.4:1 in Canada (refer Table 4.5 Panel B).
[125] *OffConc* is calculated as the sum of FTS issuer clients (that is, engagements) for the respective office, divided by the total number of listed company audit clients for the office.

engagements, audit fees and total fees (as per Table 4.4 Panel A), the majority of the firm's audit client base represent non-FTS issuing firms (in the mining industry and otherwise).

[Insert Table 4.12]

Table 4.13 captures the results of additional testing of audit office-level concentration and specialisation. Model 1 reports results where the audit fee model is modified to assess office specialisation. *OffConc* captures the proportion of FTS issuer clients for an audit office by taking the sum of FTS issuer clients for the respective office and dividing by the total listed company audit clients of that office.[126] It returns a negative and significant coefficient ($p<0.05$), demonstrating some support for office-scale effects and thus H4. This suggests auditor offices concentrated with an FTS issuing client base pass on lower costs to customers. Such lower costs could be a result of increased efficiencies in dealing with FTS-related matters.

Model 2 reports results where the model is modified to assess office specialisation. *OffSpec* is a binary variable coded =1 if the sum of FTS issuer clients for the respective office is greater than or equal to 5, and *OffConc* is greater than 25% (zero otherwise).[127] The model also controls for the Big 4 leading firm[128] considered to be FTS office specialists (*OffSpec*Big4Lead*). Both *OffSpec* and *OffSpec*Big4Lead* return insignificant results, suggesting being a specialist office does not impact audit fees

[126] *OffConc* is a modification of the partner concentration variable (*PTNRCONC*) employed by Ferguson, Pundrich & Raftery (2014). *PTNRCONC* takes the sum of MDSE audit clients for a given partner and divides by the total number of the partner's clients. Unlike the Australian setting, Canadian audit partner data is unavailable. Canadian audit office data is available however, thus making it possible to measure office concentration.

[127] *OffSpec* is a modification of the partner specialist variable (*SPECIALIST*) employed by Ferguson, Pundrich & Raftery (2014). *SPECIALIST* is a binary variable coded =1 if the audit partner signs two or more audit reports and has a partner concentration ratio greater than 75%. Since Canadian audit partner data is unavailable (while Canadian audit office data is), the *SPECIALIST* variable is modified to measure audit office specialisation in a similar fashion.

[128] Per Table 4.4 Panel A, the Big 4 leader firm is PwC.

either in general or at PwC (the Big 4 leader). It is important to note the definition of *OffSpec* biases against results skewed by the inclusion of Davidson & Company (who has a large FTS issuing client base), as the firm does not meet the criteria relating to office specialisation. As such, these results reflect the presence of office-scale effects in the absence of the FTS audit market leader. Thus, H4 is only supported from the office concentration perspective, not office specialisation.

[Insert Table 4.13]

Table 4.14 reports additional testing on the audit fee estimation of Big 4 and industry leader premiums. These models are identical to the main model reported in Table 4.9, however substitute *lnSubsidiaries* and *ForeignSubsidiaries* with *lnProjects* and *ForeignProjects*.[129] *ROI* and *CapDouble* are likewise included in the model as they feature in the extant audit pricing literature. The number of observations reduces substantially in these additional tests, since Canadian mineral project data is only available in the S&P Capital IQ database from 2011 onwards. Firstly, the explanatory power of the models increases slightly. Neither *lnProjects* or *ROI* have a statistically significant impact on audit fees, while *ForeignProjects* and *CapDouble* are positively and significantly ($p<0.01$ and $p<0.05$ respectively) related to audit fees, suggesting these factors increase audit complexity. The experimental variable results are consistent with those of Table 4.9 except for *David* in Model 2.

4.6 Conclusion

This chapter examines audit fees and auditor industry specialisation amongst firms which issue FTS. The results indicate FTS issuing MEEs pay lower audit fees than their non-FTS issuing counterparts. Since MEEs have unique characteristics which render

[129] *lnProjects* is calculated by taking the natural logarithm of the number of mineral properties operated by the firm throughout the fiscal year. *ForeignProjects* captures the proportion of the firm's mineral properties located outside of Canada throughout the fiscal year.

them complex to audit compared to small auditees from other industries,[130] this result could suggest auditors benefit from scale economies in the FTS component of MEE audits, and/or the risk mitigation provided by the FTS framework reduces the going concern risk and inherent risk of the auditee, thus leading to the reduction in audit fees. Furthermore, Big 4 firms are found to charge premiums for conducting a brand name audit, however they do in fact charge relatively lower fees to audit FTS issuing MEEs compared to non-issuers.

Amongst the sample of FTS issuers, Davidson & Company (the market leader) and Big 4 firms are all identified as applying industry leader premiums when pricing audit services. Evidence is provided suggesting these firms adopt a similar pricing strategy of charging a premium on audits given the high proportion of audit to non-audit fees.

Some support is found for scale effects at the office-level, where auditor offices concentrated with an FTS issuing client base pass on lower costs to customers by way of their increased efficiency in auditing FTS issuers. There is no evidence of office-level specialisation effects.

Prior empirical evidence in the audit pricing literature demonstrates factors which influence the determination of audit pricing are not uniform across jurisdictions. As such, this chapter contributes to the extant audit pricing literature by updating previous findings in the Canadian jurisdiction based on a large sample of Canadian MEEs over a 15-year period, and determining whether FTS play a role in audit pricing. It does so while focusing on a homogenous sample of microcap MEEs listed on the TSXV, which comprise much of the listed Canadian mining sector. The sample represents an attractive setting given the economic significance of the sector in Canada, and that the

[130] Such characteristics include long project life cycles, high levels of information asymmetry and high risk profiles (Ferguson & Lam 2021).

Canadian Government effectively co-invests in any mining projects where FTS deals are used for fundraising. The findings of this chapter will be of interest to policy-makers, practitioners and MEEs themselves to better understand the broader implications of the FTS program from a compliance and reporting perspective.

The primary limitation of this chapter pertains to the availability of data around partner sign-off of audit reports, since this data is unavailable with respect to Canadian firms. As such, it is unclear whether audit office-level fee discounts are in fact driven by underlying partner concentration and/or specialisation effects as suggested by Goodwin & Wu (2014).

Opportunities for future research in this area include examining audit quality amongst FTS issuing audit clients and the long-run performance of FTS issuers.

4.7 Appendix

Table 4.1: Number of FTS issuers subject to audit fee analysis

Selection criteria	No. of FTS issuers
Number of FTS issuers in the sample of FTS deals collected	808
Less: firms where audit data is unavailable	(48)
Less: FTS issuers where data is unavailable for one or more explanatory variable	(24)
Total number of FTS issuers subject to audit fee analysis	736

Table 4.2: Breakdown of FTS issuers by firm-year and number of auditors

Year	No. of firm-year observations	% of total observations	No. of auditors	% of total auditors
2004	158	2.23	50	32.47
2005	242	3.42	58	37.66
2006	325	4.59	64	41.56
2007	395	5.58	71	46.10
2008	459	6.49	69	44.81
2009	471	6.66	62	40.26
2010	486	6.87	59	38.31
2011	562	7.94	59	38.31
2012	579	8.18	58	37.66
2013	584	8.25	58	37.66
2014	572	8.08	59	38.31
2015	564	7.97	55	35.71
2016	560	7.91	52	33.77
2017	572	8.08	54	35.06
2018	547	7.73	48	31.17
Total	7,076	100	154	100

Table 4.3: Provincial auditor descriptive statistics by sub-industry and auditor type, FTS issuing firms

Panel A: Sub-industry descriptive statistics by province

State	Alberta		British Columbia		Manitoba		New Foundland		Nova Scotia		Ontario		Quebec		Saskatchewan		Other	
Sub-industry	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**
Coal & Consumable Fuels	26	4.73	90	2.01	0	NA	0	NA	0	NA	26	2.10	1	0.16	36	53.73	0	NA
Copper	1	0.18	33	0.74	0	NA	0	NA	0	NA	10	0.81	2	0.32	0	NA	0	NA
Diversified Metals & Mining	133	24.18	2,440	54.44	18	58.06	20	68.97	21	44.68	680	54.97	380	61.00	0	NA	4	40.00
Gold	71	12.91	1,180	26.33	8	25.81	0	NA	20	8.51	355	28.70	178	28.57	22	32.84	5	50.00
Integrated Oil & Gas	2	0.36	0	NA	0	NA	0	NA	0	NA	0	NA	1	0.16	0	NA	0	NA
Oil & Gas Equipment & Services	0	NA	0	NA	0	NA	0	NA	0	NA	20	1.62	0	NA	0	NA	0	NA
Oil & Gas Exploration & Prod.	267	48.55	204	4.55	5	16.13	0	NA	2	42.55	46	3.72	23	3.69	7	10.45	1	10.00
Precious Metals & Gemstones	33	6.00	315	7.03	0	NA	6	10.34	0	NA	40	3.23	34	5.46	0	NA	0	NA
Silver	0	NA	23	0.51	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA
Iron Ore	1	0.18	21	0.47	0	NA	0	NA	0	NA	13	1.05	0	NA	0	NA	0	NA
Former Miner	16	2.91	176	3.93	0	NA	3	20.69	4	4.26	47	3.80	4	0.64	2	2.99	0	NA
Total	550	100	4,482	100	31	100	29	100	47	100	1,237	100	623	100	67	100	10	100

Panel B: Auditor type descriptive statistics by province

State	Alberta		British Columbia		Manitoba		New Foundland		Nova Scotia		Ontario		Quebec		Saskatchewan		Other	
Auditor type	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**	**Clients**	**%**
Big 4	238	43.27	441	9.84	2	6.45	29	100	40	85.11	138	11.16	199	31.94	38	56.72	4	40.00
Non-Big 4	312	56.73	4,041	90.16	29	93.55	0	0	7	14.89	1,099	88.84	424	68.06	29	43.28	6	60.00
Total	550	100	4,482	100	31	100	29	100	47	100	1,237	100	623	100	67	100	10	100

Table 4.4: Distribution of clients and fees amongst Top 25 auditors (by market share)

Panel A: FTS issuing MEE clients

Auditor Name	Engagements	% Market (engagements)	Audit fees	% Market (fees)	NAS fees	% Market (NAS)	Total fees	% Market (total fees)
Davidson & Company	1118	15.80%	32,000,000	15.56%	5,520,541	11.89%	37,600,000	14.88%
PricewaterhouseCoopers	506	7.15%	21,400,000	10.39%	7,688,393	16.56%	29,100,000	11.53%
Dale Matheson Carr-Hilton LaBonte	354	5.00%	7,242,290	3.52%	1,108,770	2.39%	8,351,060	3.31%
MNP	323	4.56%	9,181,888	4.46%	1,555,492	3.35%	10,700,000	4.26%
DeVisser Gray	320	4.52%	5,279,221	2.56%	386,331	0.83%	5,665,552	2.25%
Grant Thornton	308	4.35%	10,400,000	5.07%	2,613,598	5.63%	13,100,000	5.17%
Smythe Ratcliffe	291	4.11%	8,401,564	4.08%	1,801,322	3.88%	10,200,000	4.04%
Manning Elliott	283	4.00%	6,176,545	3.00%	923,322	1.99%	7,099,867	2.81%
KPMG	277	3.91%	12,300,000	5.99%	4,202,152	9.05%	16,500,000	6.56%
McGovern Hurley Cunningham	255	3.60%	8,673,150	4.21%	2,273,836	4.90%	10,900,000	4.34%
Deloitte & Touche	235	3.32%	11,000,000	5.36%	4,695,299	10.11%	15,700,000	6.23%
BDO Canada	214	3.02%	8,717,922	4.23%	2,277,216	4.90%	11,000,000	4.36%
MacKay	183	2.59%	4,632,422	2.25%	525,370	1.13%	5,157,792	2.04%
Crowe MacKay	137	1.94%	2,904,909	1.41%	290,791	0.63%	3,195,700	1.27%
Morgan & Company Chartered Accountants	115	1.63%	2,603,038	1.26%	258,362	0.56%	2,861,400	1.13%
Ernst &Young	112	1.58%	5,094,688	2.47%	1,856,525	4.00%	6,951,213	2.75%
Collins Barrow Toronto	111	1.57%	3,096,874	1.50%	486,417	1.05%	3,583,291	1.42%
Smythe	97	1.37%	2,061,131	1.00%	333,052	0.72%	2,394,183	0.95%
Charlton & Company Chartered Accountants	90	1.27%	2,167,742	1.05%	91,505	0.20%	2,259,247	0.90%
BDO Dunwoody	86	1.22%	3,069,917	1.49%	481,857	1.04%	3,551,774	1.41%
UHY McGovern Hurley	77	1.09%	1,857,695	0.90%	387,105	0.83%	2,244,800	0.89%
Saturna Group Chartered Accountants	70	0.99%	891,035	0.43%	57,497	0.12%	948,532	0.38%
Dallaire & Lapointe	68	0.96%	2,073,126	1.01%	339,615	0.73%	2,412,741	0.96%
Wasserman Ramsay	67	0.95%	1,313,879	0.64%	56,662	0.12%	1,370,541	0.54%
Parker Simone	59	0.83%	1,222,869	0.59%	146,129	0.31%	1,368,998	0.54%
Total	5,756	81.35%	173,761,905	84.46%	40,357,159	86.92%	214,216,691	84.91%

Panel B: Non-FTS issuing MEE clients

Auditor Name	Engagements	% Market (engagements)	Audit fees	% Market (fees)	NAS fees	% Market (NAS)	Total fees	% Market (total fees)
Davidson & Company	915	14.06%	26,500,000	11.30%	4,461,282	7.00%	31,000,000	10.38%
PricewaterhouseCoopers	498	7.65%	30,600,000	13.03%	12,700,000	19.89%	43,200,000	14.50%
KPMG	440	6.76%	25,700,000	10.94%	7,685,750	12.05%	33,300,000	11.18%
Dale Matheson Carr-Hilton LaBonte	429	6.59%	9,598,837	4.09%	1,264,314	1.98%	10,900,000	3.64%
Grant Thornton	314	4.82%	13,400,000	5.70%	4,426,311	6.94%	17,800,000	5.97%
MNP	300	4.61%	9,883,951	4.21%	4,624,724	7.25%	14,500,000	4.86%
Ernst & Young	241	3.70%	13,600,000	5.81%	5,595,360	8.78%	19,200,000	6.44%
DeVisser Gray	224	3.44%	3,953,554	1.69%	456,711	0.72%	4,410,265	1.48%
Deloitte & Touche	215	3.30%	13,000,000	5.55%	5,577,852	8.75%	18,600,000	6.23%
Smythe Ratcliffe	212	3.26%	6,732,796	2.87%	958,659	1.50%	7,691,455	2.58%
BDO Canada	192	2.95%	13,000,000	5.56%	4,501,922	7.06%	17,500,000	5.88%
D&H Group	169	2.60%	4,261,887	1.82%	346,960	0.54%	4,608,847	1.55%
Manning Elliott	159	2.44%	3,912,970	1.67%	638,884	1.00%	4,551,854	1.53%
MacKay	148	2.27%	4,127,297	1.76%	477,886	0.75%	4,605,183	1.54%
McGovern Hurley Cunningham	146	2.24%	4,731,373	2.02%	891,672	1.40%	5,623,045	1.89%
Morgan & Company Chartered Accountants	132	2.03%	3,310,837	1.41%	236,418	0.37%	3,547,255	1.19%
Smythe	83	1.28%	2,252,440	0.96%	338,470	0.53%	2,590,910	0.87%
Saturna Group Chartered Accountants	80	1.23%	976,100	0.42%	200,247	0.31%	1,176,347	0.39%
Collins Barrow Toronto	80	1.23%	2,342,949	1.00%	384,027	0.60%	2,726,976	0.91%
Crowe MacKay	80	1.23%	2,218,701	0.95%	190,122	0.30%	2,408,823	0.81%
BDO Dunwoody	76	1.17%	2,437,525	1.04%	701,009	1.10%	3,138,534	1.05%
Collins Barrow Calgary	65	1.00%	2,725,255	1.16%	807,782	1.27%	3,533,037	1.18%
Meyers Norris Penny	53	0.81%	1,481,446	0.63%	245,046	0.38%	1,726,492	0.58%
UHY McGovern Hurley	50	0.77%	1,448,720	0.62%	212,247	0.33%	1,660,967	0.56%
Morgan & Company	48	0.74%	768,970	0.33%	68,973	0.11%	837,943	0.28%
Total	5,349	82.19%	202,965,608	86.53%	57,992,628	90.92%	260,837,933	87.47%

Table 4.5: Descriptive statistics of FTS issuing firms (audit clients)

Panel A: Model variables

Variable	Mean	Median	SD	Min.	Max.	Skew.	Kurt.
lnAF	10.28	10.09	0.64	8.63	11.55	0.29	3.87
lnMarketcap	16.37	15.39	1.53	12.16	18.56	0.02	3.33
lnSubs	-1.61	0.00	0.13	0.00	1.79	6.91	53.87
ForeignSubs	0.04	0.00	0.19	0.00	1.00	4.66	23.15
lnCash	14.09	12.68	2.39	0.00	16.39	-0.79	4.07
Quick	7.88	2.60	13.13	0.01	65.52	2.79	11.16
lnExplorExp	14.02	12.65	5.63	0.00	16.16	-1.08	2.53
lnCFLosses	15.46	14.93	3.94	0.00	17.30	-2.93	10.70
DE	0.16	0.00	0.60	0.00	3.81	5.08	29.40
lnAge	2.91	2.77	0.88	0.00	4.13	-0.70	3.18
Float	0.76	0.81	0.21	0.01	0.99	-1.59	5.82
YE	0.58	1.00	0.49	0.00	1.00	-0.32	1.10
Opin	0.64	1.00	0.48	0.00	1.00	-0.58	1.34
Big4	0.16	0.00	0.37	0.00	1.00	1.86	4.46
lnProjects	1.02	0.69	0.86	0.00	2.57	0.84	2.73
ForeignProjects	0.14	0.00	0.30	0.00	1.00	2.01	5.68
ROI	-1.06	-0.24	2.48	-14.49	-0.01	-4.09	20.43
CapDouble	0.13	0.00	0.33	0.00	1.00	2.26	6.12

Panel B: Associated factors

Factor	Mean	Median	SD	Min.	Max.	Skew.	Kurt.
AuditFees	29,100	24,020	19,806	5,580	103,905	1.85	6.84
Marketcap	12,801,744	4,802,547	21,689,727	191,252	114,900,000	3.15	13.50
TotalAssets	9,687,118	3,647,914	16,111,004	25,951	82,973,000	2.95	12.14
lnTA	16.09	15.11	1.83	10.88	18.23	-0.61	3.86
Subsidiaries	0.20	0.00	0.49	0.00	6.00	2.98	15.08
Cash	1,317,953	321,655	2,561,887	1.00	13,138,000	3.16	13.29
ExplorExp	1,230,564	312,345	2,173,408	0.00	10,454,851	2.70	10.38
CFLosses	5,180,551	3,048,000	6,429,448	0.00	32,478,000	2.48	9.77
Age	18.34	16.00	13.45	1.00	62.00	1.16	4.41
Projects	2.78	2.00	3.32	0.00	13.00	1.59	5.01
NonAuditFees	6,562	1,922	13,366	0.00	124,600	3.56	17.84
NCOperations	-820,239	-444,419	1,254,377	-6,712,031	1,390,055	-2.74	12.16

Variable definitions can be found at Attachment 4.2 Panels A & B respectively.

Table 4.6: Audit fee determinants comparing FTS and matched non-FTS issuing firms

Panel A: Model variables

		FTS issuers		Matched non-FTS issuers		Difference tests	
Variables	**N**	**Mean**	**Median**	**Mean**	**Median**	***t*-test**	**Wilcoxon**
lnAF	6,508	10.28	10.11	10.49	10.24	-13.22***	-12.21***
lnTAF	6,508	10.48	10.22	10.73	10.36	-15.45***	-14.00***
lnMarketcap	6,508	16.33	15.42	16.45	15.58	-4.64***	-5.02***
lnSubsidiaries	6,508	-1.66	0.00	-1.43	0.00	-4.96***	-4.45***
ForeignSubsidiaries	6,508	0.04	0.00	0.06	0.00	-4.80***	-4.90***
lnCash	6,508	14.06	12.76	14.28	13.00	-0.92	-6.90***
Quick	6,508	8.14	2.82	9.25	2.36	-4.29***	-0.26
YE	6,508	0.58	1.00	0.53	1.00	5.83***	5.81***
lnExplorExp	6,508	14.02	12.80	13.74	11.47	24.14***	21.15***
lnCFLosses	6,508	15.44	14.92	15.78	15.06	-3.85***	-3.28***
DE	6,508	0.12	0.00	0.35	0.00	-11.36***	-14.17***
Opin	6,508	0.64	1.00	0.56	1.00	10.14***	10.06***
lnAge	6,508	2.91	2.77	2.80	2.56	9.53***	9.50***
Float	6,508	0.75	0.81	0.72	0.76	8.21***	10.12***
Big4	6,508	0.16	0.00	0.21	0.00	-8.12***	-8.07***
David	6,508	0.16	0.00	0.14	0.00	2.81***	2.81***
lnProjects	4,134	1.01	0.69	0.17	0.00	25.96***	24.81***
ForeignProjects	4,134	0.14	0.00	0.36	0.00	-26.10***	-21.69***
ROI	6,508	-0.85	-0.23	-0.87	-0.25	0.81	2.14**
CapDouble	6,508	0.13	0.00	0.15	0.00	-3.86***	-3.86***

Panel B: Associated factors

		FTS issuers		Matched non-FTS issuers		Difference tests	
Factors	**N**	**Mean**	**Median**	**Mean**	**Median**	***t*-test**	**Wilcoxon**
AuditFees	6,508	29,042	24,660	36,039	28,000	-18.99***	-15.06***
TotalAuditFees	6,508	35,446	27,425	45,837	31,500	-19.21***	-16.03***
Marketcap	6,508	12,300,000	4,971,137	13,800,000	5,829,280	-5.08***	-6.55***
TotalAssets	6,508	9,126,352	3,885,881	9,128,342	3,872,000	-0.77	0.84
lnTA	6,508	15.01	15.17	15.01	15.17	-0.67	2.33**
Subsidiaries	6,508	0.19	0.00	0.24	0.00	-5.18***	-4.14***
Cash	6,508	1,275,028	321,655	1,587,467	440,655	-7.65***	-9.29***
ExplorExp	6,508	1,231,133	312,345	930,799	95,968	10.05***	14.08***
CFLosses	6,508	5,078,053	3,048,000	7,136,357	3,483,754	-16.09***	-10.46***
Age	6,508	18.27	16.00	16.46	13.00	7.84***	8.58***
Projects	4,134	2.75	2.00	1.18	0.00	27.96***	26.87***

Variable definitions can be found at Attachment 4.2 Panels A & B respectively.

Table 4.7: Correlation matrix

Variables	lnAF	lnMarketcap	lnSubs	ForeignSub	lnCash	Quick	YE	lnExplorExp	lnCFLosses	DE	Opin	lnAge	Float	FTS	Big4	David
lnAF	1.000															
lnMarketcap	0.465 ***	1.000														
lnSubs	0.183 ***	0.079 ***	1.000													
ForeignSub	0.109 ***	0.054 ***	0.290 ***	1.000												
lnCash	0.283 ***	0.503 ***	0.076 ***	0.055 ***	1.000											
Quick	-0.119 ***	0.123 ***	-0.041 ***	-0.041 ***	0.333 ***	1.000										
YE	-0.182 ***	-0.073 ***	-0.074 ***	0.026 ***	-0.075 ***	0.012	1.000									
lnExplorExp	0.046 ***	0.206 ***	-0.015 *	0.065 ***	0.150 ***	0.013	0.078 ***	1.000								
lnCFLosses	0.166 ***	0.063 ***	0.055 ***	0.062 ***	0.039 ***	-0.060 ***	0.020 **	0.209 ***	1.000							
DE	-0.026 ***	-0.130 ***	0.002	0.002	-0.196 ***	-0.113 ***	-0.031 ***	-0.121 ***	0.060 ***	1.000						
Opin	-0.073 ***	-0.187 ***	0.018 **	0.062 ***	-0.245 ***	-0.267 ***	0.018 **	0.087 ***	0.192 ***	0.110 ***	1.000					
lnAge	0.099 ***	0.037 ***	0.060 ***	0.021 **	-0.070 ***	-0.116 ***	-0.045 ***	0.031 ***	0.156 ***	0.087 ***	0.106 ***	1.000				
Float	-0.051 ***	-0.043 ***	-0.060 ***	0.001	-0.055 ***	-0.036 ***	0.070 ***	0.055 ***	0.044 ***	-0.054 ***	0.008	0.141 ***	1.000			
FTS	-0.096 ***	-0.036 ***	-0.038 ***	-0.039 ***	-0.023 ***	-0.046 ***	0.048 ***	0.186 ***	0.030 ***	-0.079 ***	0.077 ***	0.084 ***	0.074 ***	1.000		
Big4	0.358 ***	0.209 ***	0.088 ***	0.053 ***	0.159 ***	-0.030 ***	-0.200 ***	-0.073 ***	0.008	-0.025 ***	-0.112 ***	-0.035 ***	-0.089 ***	-0.070 ***	1.000	
David	-0.024 ***	0.011	-0.010	-0.019 **	0.038 ***	0.061 ***	0.079 ***	0.088 ***	0.032 ***	-0.006	0.013	-0.028 ***	0.008	0.024 ***	-0.200 ***	1.000

Variable definitions can be found at Attachment 4.2 Panel A.

Table 4.8: Matched cross-sectional regression fee estimation models

Variables	Predicted sign	Model 1 lnAF	Model 2 lnAF	Model 3 lnTAF	Model 4 lnTAF
Intercept	?	7.142***	7.040***	7.144***	7.022***
		(0.060)	*(0.062)*	*(0.063)*	*(0.065)*
lnMarketcap	+	0.161***	0.179***	0.176***	0.197***
		(0.004)	*(0.004)*	*(0.004)*	*(0.004)*
lnSubs	+	0.394***	0.436***	0.368***	0.416***
		(0.034)	*(0.035)*	*(0.035)*	*(0.037)*
ForeignSubs	+	0.111***	0.156***	0.101***	0.153***
		(0.025)	*(0.026)*	*(0.026)*	*(0.027)*
lnCash	-	0.026***	0.030***	0.030***	0.035***
		(0.002)	*(0.002)*	*(0.002)*	*(0.003)*
Quick	-	-0.009***	-0.010***	-0.009***	-0.010***
		(0.000)	*(0.000)*	*(0.000)*	*(0.000)*
YE	-	-0.121***	-0.173***	-0.141***	-0.202***
		(0.010)	*(0.010)*	*(0.011)*	*(0.011)*
lnExplorExp	?	-0.004***	-0.006***	-0.006***	-0.009***
		(0.001)	*(0.001)*	*(0.001)*	*(0.001)*
lnCFLosses	+	0.020***	0.021***	0.018***	0.020***
		(0.001)	*(0.001)*	*(0.001)*	*(0.001)*
DE	+	0.005	0.003	0.003	0.002
		(0.004)	*(0.004)*	*(0.004)*	*(0.005)*
Opin	+	-0.056***	-0.083***	-0.075***	-0.106***
		(0.011)	*(0.011)*	*(0.011)*	*(0.012)*
lnAge	-	0.047***	0.040***	0.023***	0.014**
		(0.006)	*(0.006)*	*(0.006)*	*(0.006)*
Float	-	-0.045*	-0.086***	-0.060**	-0.108***
		(0.025)	*(0.025)*	*(0.026)*	*(0.027)*
FTS	?	-0.053***	-0.133***	-0.064***	-0.153***
		(0.011)	*(0.011)*	*(0.012)*	*(0.012)*
Big4	+	0.501***		0.576***	
		(0.017)		*(0.018)*	
FTS*Big4	+	-0.220***		-0.231***	
		(0.025)		*(0.026)*	
David	+		-0.121***		-0.154***
			(0.021)		*(0.022)*
FTS*David	+		0.211***		0.245***
			(0.028)		*(0.030)*
N		12,696	12,696	12,696	12,696
F-value		481.76***	390.16***	529.84***	414.06***
Adjusted R^2		36.23%	31.50%	38.46%	32.80%

Standard errors are reported below the coefficients.
Variable definitions can be found at Attachment 4.2 Panel A.

Table 4.9: Audit fee estimation of Big 4 and industry leader premiums

Variables	Predicted sign	Model 1 lnAF	Model 2 lnAF	Model 3 lnAF
Intercept		7.009***	6.880***	6.988***
		(0.076)	*(0.077)*	*(0.075)*
lnMarketcap	+	0.143***	0.155***	0.143***
		(0.005)	*(0.005)*	*(0.005)*
lnSubsidiaries	+	0.336***	0.343***	0.328***
		(0.050)	*(0.051)*	*(0.050)*
ForeignSubsidiaries	+	0.181***	0.188***	0.197***
		(0.033)	*(0.034)*	*(0.033)*
lnCash	-	0.053***	0.057***	0.052***
		(0.004)	*(0.004)*	*(0.004)*
Quick	-	-0.007***	-0.008***	-0.007***
		(0.001)	*(0.001)*	*(0.001)*
YE	-	-0.127***	-0.163***	-0.127***
		(0.013)	*(0.013)*	*(0.013)*
lnExplorExp	?	0.002	0.000	0.001
		(0.001)	*(0.001)*	*(0.001)*
lnCFLosses	+	0.013***	0.014***	0.013***
		(0.002)	*(0.002)*	*(0.002)*
DE	+	0.001	0.004	0.000
		(0.011)	*(0.011)*	*(0.011)*
Opin	+	0.000	-0.015	-0.002
		(0.014)	*(0.014)*	*(0.014)*
lnAge	-	0.025***	0.014*	0.027***
		(0.007)	*(0.008)*	*(0.007)*
Float	-	0.051	0.030	0.055*
		(0.031)	*(0.032)*	*(0.031)*
Big4	+	0.302***		
		(0.018)		
David	+		0.069***	0.125***
			(0.017)	*(0.017)*
Big4Lead	+			0.268***
				(0.025)
Big4NonLead	+			0.374***
				(0.023)
N		7,076	7,076	7,076
F-value		289.59***	258.79***	257.42***
Adjusted R^2		34.65%	32.14%	35.22%

Standard errors are reported below the coefficients.
Variable definitions can be found at Attachment 4.2 Panel A.

Table 4.10: Variance inflation factors

Factors	Model 1	Model 2	Model 3
lnMarketcap	1.67	1.64	1.67
lnSubsidiaries	1.06	1.06	1.06
ForeignSubsidiaries	1.03	1.04	1.04
lnCash	1.93	1.92	1.94
Quick	1.23	1.22	1.23
YE	1.06	1.04	1.06
lnExplorExp	1.13	1.13	1.14
lnCFLosses	1.09	1.09	1.09
DE	1.15	1.15	1.15
Opin	1.18	1.18	1.18
lnAge	1.12	1.11	1.12
Float	1.05	1.05	1.05
Big4	1.11		
David		1.01	1.05
Big4Lead			1.07
Big4NonLead			1.12
Variance inflation factor	1.22	1.20	1.20

Table 4.11: Total fee estimation of service bundling premiums

Variables	Predicted sign	Model 1 lnTAF	Model 2 lnTAF	Model 3 lnTAF
Intercept		6.983***	6.829***	6.961***
		(0.078)	*(0.080)*	*(0.078)*
lnMarketcap	+	0.153***	0.169***	0.154***
		(0.005)	*(0.006)*	*(0.005)*
lnSubsidiaries	+	0.393***	0.402***	0.384***
		(0.052)	*(0.053)*	*(0.051)*
ForeignSubsidiaries	+	0.192***	0.199***	0.209***
		(0.034)	*(0.035)*	*(0.034)*
lnCash	-	0.060***	0.065***	0.059***
		(0.004)	*(0.004)*	*(0.004)*
Quick	-	-0.008***	-0.009***	-0.008***
		(0.001)	*(0.001)*	*(0.001)*
YE	-	-0.125***	-0.168***	-0.125***
		(0.013)	*(0.014)*	*(0.013)*
lnExplorExp	?	0.001	-0.001	0.001
		(0.001)	*(0.001)*	*(0.001)*
lnCFLosses	+	0.011***	0.012***	0.011***
		(0.002)	*(0.002)*	*(0.002)*
DE	+	0.005	0.009	0.004
		(0.012)	*(0.012)*	*(0.011)*
Opin	+	-0.008	-0.025*	-0.010
		(0.014)	*(0.015)*	*(0.014)*
lnAge	-	0.012	-0.001	0.014*
		(0.008)	*(0.008)*	*(0.008)*
Float	-	0.031	0.006	0.036
		(0.032)	*(0.033)*	*(0.032)*
Big4	+	0.369***		
		(0.018)		
David	+		0.066***	0.134***
			(0.018)	*(0.018)*
Big4Lead	+			0.335***
				(0.026)
Big4NonLead	+			0.443***
				(0.024)
N		7,076	7,076	7,076
F-value		327.53***	282.44***	290.96***
Adjusted R^2		37.50%	34.09%	38.07%

Standard errors are reported below the coefficients.
Variable definitions can be found at Attachment 4.2 Panel A.

Table 4.12: Distribution of FTS issuing clients amongst Top 25 auditor offices (by FTS issuing client engagement count)

Audit firm	Office	Engagements	OffConc
Davidson & Company	Vancouver	1,117	20.01%
Dale Matheson Carr-Hilton LaBonte	Vancouver	352	13.43%
DeVisser Gray	Vancouver	320	22.97%
Smythe Ratcliffe	Vancouver	291	21.13%
Manning Elliott	Vancouver	282	15.52%
McGovern Hurley Cunningham	Toronto	254	17.84%
PricewaterhouseCoopers	Vancouver	202	5.88%
MacKay	Vancouver	160	22.25%
BDO Canada	Vancouver	159	21.03%
Grant Thornton	Val-d'Or	143	33.81%
Crowe MacKay	Vancouver	125	32.47%
MNP	Vancouver	121	14.05%
Morgan & Company Chartered Accountants	Vancouver	115	13.19%
Collins Barrow Toronto	Toronto	111	10.44%
KPMG	Calgary	103	2.64%
Smythe	Vancouver	97	18.91%
PricewaterhouseCoopers	Montreal	96	6.83%
Charlton & Company Chartered Accountants	Vancouver	90	15.99%
Deloitte & Touche	Vancouver	88	4.65%
UHY McGovern Hurley	Toronto	77	25.16%
PricewaterhouseCoopers	Toronto	75	1.17%
BDO Dunwoody	Vancouver	72	13.79%
Ernst & Young	Vancouver	71	5.79%
Saturna Group Chartered Accountants	Vancouver	71	2.48%
Total		4,662	

Table 4.13: Additional testing of audit office-level concentration and specialisation

Variables	Predicted sign	Model 1 lnAF	Model 2 lnAF
Intercept		7.023***	6.991***
		(0.077)	*(0.076)*
lnMarketcap	+	0.143***	0.143***
		(0.005)	*(0.005)*
lnSubsidiaries	+	0.325***	0.328***
		(0.050)	*(0.050)*
ForeignSubsidiaries	+	0.197***	0.197***
		(0.033)	*(0.033)*
lnCash	-	0.052***	0.052***
		(0.004)	*(0.004)*
Quick	-	-0.007***	-0.007***
		(0.001)	*(0.001)*
YE	-	-0.127***	-0.127***
		(0.013)	*(0.013)*
lnExplorExp	?	0.002	0.001
		(0.001)	*(0.001)*
lnCFLosses	+	0.013***	0.013***
		(0.002)	*(0.002)*
DE	+	0.000	0.000
		(0.011)	*(0.011)*
Opin	+	-0.002	-0.002
		(0.014)	*(0.014)*
lnAge	-	0.027***	0.027***
		(0.007)	*(0.007)*
Float	-	0.056*	0.054*
		(0.031)	*(0.031)*
David	+	0.127***	0.125***
		(0.017)	*(0.018)*
Big4Lead	+	0.247***	0.271***
		(0.027)	*(0.025)*
Big4NonLead	+	0.352***	0.374***
		(0.025)	*(0.023)*
OffConc	-	-0.170**	
		(0.085)	
OffSpec	+		0.003
			(0.021)
OffSpec*Big4Lead	?		-0.227
			(0.214)
N		7,076	7,076
F-value		241.68***	227.17***
Adjusted R^2		35.25%	35.21%

Standard errors are reported below the coefficients.
Variable definitions can be found at Attachment 4.2 Panel A.

Table 4.14: Additional testing of Big 4 and industry leader premiums

Variables	Predicted sign	Model 1 lnAF	Model 2 lnAF	Model 3 lnAF
Intercept		7.079***	6.928***	7.072***
		(0.096)	*(0.099)*	*(0.096)*
lnMarketcap	+	0.148***	0.163***	0.148***
		(0.006)	*(0.006)*	*(0.006)*
lnProjects	+	-0.011	-0.020**	-0.012
		(0.009)	*(0.009)*	*(0.009)*
ForeignProjects	+	0.078***	0.082***	0.068***
		(0.025)	*(0.026)*	*(0.025)*
lnCash	-	0.043***	0.050***	0.042***
		(0.004)	*(0.004)*	*(0.004)*
Quick	-	-0.006***	-0.007***	-0.006***
		(0.001)	*(0.001)*	*(0.001)*
YE	-	-0.082***	-0.122***	-0.082***
		(0.015)	*(0.016)*	*(0.015)*
lnExplorExp	?	0.001	-0.001	0.001
		(0.002)	*(0.002)*	*(0.002)*
lnCFLosses	+	0.010***	0.012***	0.009***
		(0.002)	*(0.002)*	*(0.002)*
DE	+	0.001	0.008	0.003
		(0.012)	*(0.013)*	*(0.012)*
Opin	+	-0.116***	-0.134***	-0.119***
		(0.022)	*(0.023)*	*(0.022)*
lnAge	-	0.047***	0.032***	0.048***
		(0.009)	*(0.010)*	*(0.009)*
Float	-	0.114***	0.070*	0.120***
		(0.038)	*(0.039)*	*(0.038)*
ROI	?	0.004	0.004	0.004
		(0.003)	*(0.003)*	*(0.003)*
CapDouble	+	0.062**	0.050*	0.062**
		(0.025)	*(0.026)*	*(0.025)*
Big4	+	0.377***		
		(0.022)		
David	+		0.027	0.092***
			(0.020)	*(0.019)*
Big4Lead	+			0.329***
				(0.029)
Big4NonLead	+			0.462***
				(0.029)
N		4,540	4,540	4,540
F-value		195.15***	164.76***	175.49***
Adjusted R^2		39.08%	35.11%	39.52%

Attachment 4.1: Accounting journal entries capturing FTS transactions[131]

PCP Ltd. is a publicly traded Canadian mining entity that prepares its financial statements in accordance with IFRSs.

Assume that:

- PCP Ltd. received $100 from the issue of flow-through shares on December 1, 20X1;
- the fair value of PCP Ltd. ordinary shares is $90 on December 1, 20X1;
- PCP Ltd. renounced with an effective date of December 31, 20X1, but filed the paperwork to renounce on January 31, 20X2;
- PCP Ltd. incurred eligible expenditures of $100 (on February 12, 20X2 for the purpose of illustrating prospective renouncement and, on December 11, 20X1 for the purpose of illustrating retrospective renouncement), which were capitalized; and
- the tax rate applicable to PCP Ltd. is 30%.

1—Issue of Ordinary Shares and Sale of Tax Deductions

The sale of tax deductions is measured at $10. In this particular case, the residual method [$100 – 90] and the relative fair value method [($100 – 90) × 100 / $100] produce the same result.

Therefore, the journal entry on December 1, 20X1, to record the issue of ordinary shares and the sale of tax deductions is:

Dr.	Cash (statement of financial position)		100	
	Cr.	Share Capital (statement of financial position)		90
	Cr.	Other Liabilities (statement of financial position)		10

2—Capitalization of Eligible Expenditures

The journal entry to capitalize eligible expenditures is:

Dr.	Capitalized Eligible Expenditures (statement of financial position)		100	
	Cr.	Cash (statement of financial position)		100

3—Fulfillment of Obligation and Recognition of Deferred Tax Liability

The journal entry to record the fulfillment of the obligation to pass on the tax deductions is:

Dr.	Other Liabilities (statement of financial position)		10	
	Cr.	Other Income or Deferred Tax Expense (income statement)		10

The deferred tax liability is measured at $30 [($100 – 0) × 30%].

The journal entry to recognize the deferred tax liability is:

Dr.	Deferred Tax Expense (income statement)		30	
	Cr.	Deferred Tax Liability (statement of financial position)		30

If renouncement is prospective, these journal entries are booked on February 12, 20X2.

If renouncement is retrospective, these journal entries are booked on:

- December 11, 20X1, if the view is that the obligation is fulfilled when eligible expenditures are incurred as long as there is the intention to renounce; and
- January 31, 20X2, if the view is that the obligation is fulfilled when the paperwork to renounce is filed.

[131] (Mining Industry Task Force on IFRSs 2015)

Attachment 4.2: Variable measurements

Panel A: Model variables	
Variable	**Measurement**
lnAF	= natural logarithm of audit fees
lnMarketcap	= natural logarithm of market capitalisation
lnTA	= natural logarithm of total assets
lnSubsidiaries	= natural logarithm of subsidiaries
ForeignSubsidiaries	= proportion of subsidiaries located outside of Canada throughout the fiscal year
lnCash	= natural logarithm of cash
Quick	= ratio of current assets (less inventories), to current liabilities
YE	= 1 if non-31 December balance date; zero otherwise
lnExplorExp	= natural logarithm of amount spent on exploration
lnCFLosses	= natural logarithm of deferred tax assets not recognised
DE	= ratio of non-current liabilities to total assets
Opin	= 1 if qualified audit opinion; zero otherwise
lnAge	= natural logarithm of number of years since incorporation
Float	= proportion of common shares held in float
FTS	= 1 if FTS issuing firm; zero otherwise
Big4	= 1 if Big 4 auditor; zero otherwise
David	= 1 if Davidson & Company auditor; zero otherwise
OffConc	= sum of FTS issuer clients for Office *i* divided by total listed company audit clients for Office *i*
OffSpec	= 1 if sum of FTS issuer clients for Office *i* is >=5 & OffConc >0.25; zero otherwise
lnProjects	= natural logarithm of number of mineral properties throughout the fiscal year
ForeignProjects	= proportion of mineral properties located outside of Canada throughout the fiscal year
ROI	= ratio of earnings before interest and taxes to total assets
CapDouble	= 1 if issued capital more than doubled from two years prior (excl. IPOs); zero otherwise

Panel B: Descriptive variables	
Variable	**Measurement**
AuditFees	= audit fees
NonAuditFees	= non-audit services fees
NCOperations	= net cash flows from operations
Cash	= cash
ExplorExp	= amount spent on exploration
Marketcap	= market capitalisation
TotalAssets	= total assets
CFLosses	= deferred tax assets not recognised
Projects	= number of mineral properties held throughout the fiscal year
Subsidiaries	= number of subsidiaries

5.0 CONCLUSIONS

5.1 Introduction

This chapter summarises the research undertaken in this thesis. The chapter is structured as follows. Firstly, a summary of the thesis is provided in Section 2 including a summary of the flow-through shares (FTS) context and the sample employed. Section 3 contains a summary of each respective chapter, including the research questions addressed, the methodology employed and resulting findings. Section 4 outlines the contributions of this thesis to the literature, its limitations, and avenues for future research.

5.2 Thesis summary

This thesis conducts an exploratory empirical investigation into Canada's FTS scheme. FTS are a type of common share unique to Canada which entitle the initial purchaser to claim an income tax deduction equal to the resource expenses renounced by the issuing firm, up to the amount paid by the purchaser (Gravelle 2012). The FTS scheme was introduced by the Canadian Government to encourage investment in the Canadian mining industry, and is based on the premise that tax deductions arising from exploration and development expenditures incurred by such firms are more valuable to FTS holders than the corporation itself (Fitzgerald 2012). Thus, the Canadian Government effectively co-invests in mining projects where FTS deals are used for capital raising. The scheme represents a means of de-risking, and subsequently incentivising investment into, the high-risk junior mineral exploration sector. This works to alleviate the agency problems associated with information asymmetry in the junior exploration sector and provide tax-effective exposure to mining project upside.

The FTS sample utilised in this thesis covers all FTS deals issued on the TSXV between 2001 to 2019 (inclusive). The sample has been identified through the triangulation of

three data sources, including firm financial statements, the S&P Capital IQ database and Factiva. This data collection process yields a sample of 5,369 completed FTS deals issued by 808 firms between 2001 and 2019.

5.3 Research summary

Chapter 2 explores the characteristics of FTS issuers and subsequently examines the determinants of the FTS issuance premium on a subsample of FTS deals. A positive association is predicted between the magnitude of the FTS issuance premium (discount) and the tax benefits associated with the FTS deal.

An ordinary least squares (OLS) regression model is employed to quantify the determinants of the FTS premium (discount). A continuous dependent variable is employed to capture the extent of the FTS premium (discount). This is regressed on explanatory variables which proxy for the FTS premium as a pricing mechanism of the tax benefits available to investors, along with various controls for firm prospectivity, factors recorded in the literature as impacting SEO discounting, and other MEE-specific variables.

Amongst the sample of FTS deals examined, the mean issuance premium is 11% and most FTS deals are issued at a premium of at least 11%. The largest premiums are observed in the Gold sub-industry, and the extent of FTS discounting is inversely related to firm size. Quebec is the only project location which consistently demonstrates a positive and significant relationship to the extent of the FTS premium (discount), suggesting investors are willing to pay a premium to access the 120% tax deduction on eligible exploration expenditures available in this province (rather than provincial tax credits offered in other provinces). This finding provides partial support for the conjecture that the FTS issuance premium is a pricing mechanism for the tax benefits FTS afford investors.

Chapter 3 examines firm share price reactions to announcements of FTS placements in comparison to other seasoned equity announcements by the same firms. The share price reaction to the announcement of FTS deals is hypothesised to be greater than other SEO announcements by the same firms.

The magnitude of the abnormal return is measured relative to the market return and regressed on the cross-sectional determinants of abnormal returns. These are drawn from the prior literature and include relative offering size, firm size, share price run up and the extent of the offer premium (discount). An indicator of whether the deal pertains to FTS or other type of SEO is also incorporated as the experimental variable.

Mean excess returns of +1.2% and +1.8% are observed over the event window amongst FTS and other SEO deals respectively. The largest FTS returns are observed amongst the smallest firms, and firms within the Gold and Oil & Gas Exploration and Production sectors. Specifically, FTS deals are observed to have a negative and significant association with announcement returns. The findings suggest the market does not react as favourably to FTS deals which offer tax-effective exposure to exploration upside, compared to the announcement of other SEO deals. This might indicate the participation of informed investors in private SEO placements (absent the benefits afforded by FTS) leads to a substantial reduction in information asymmetry and subsequently larger positive market reaction. Furthermore, MEEs may prefer to employ FTS when raising capital for higher risk (or lower quality) projects, where the additional risk is mitigated by the tax benefits FTS offer investors.

Taken together with the findings of Chapter 2, it appears investors prefer other types of SEO deals compared to FTS. This can be partially driven by the different investor categories comprising FTS issuing MEEs; specifically, that only the initial purchasers of FTS are eligible to claim the tax benefits associated with them, while existing non-

FTS shareholders and subsequent purchasers of FTS are not. While FTS afford eligible investors a range of tax benefits which mitigate some of the risk involved in MEE investments, the capital raisings from standard SEOs can be used to fund a wider range of activities, including offshore exploration. When participating in FTS deals, investors appear to prefer the tax deduction format of tax benefits offered in Quebec over the tax credits available in other provinces. However overall, it appears investors perceive offshore mineral exploration projects to be more prospective than domestic Canadian projects, and this manifests in a more positive reaction to SEO deals which are not restricted to funding domestic exploration only.

Chapter 4 examines the audit pricing implications of FTS issuance and addresses whether audit fee premiums with respect to brand name and industry leadership apply to Canadian MEEs which issue FTS. MEEs which issue FTS are predicted to be subject to higher audit fees than MEEs which do not.

An OLS regression is employed to analyse an audit fee model. The natural logarithm of audit fees is employed as the dependent variable. The model includes controls which capture client-specific supply-side audit risk (including auditee size, risk and complexity), and is augmented to include additional industry-related explanatory variables relevant to the MEE and FTS contexts. These industry-related variables include the number of mineral properties operated by the MEE (and the proportion of them located outside of Canada), exploration expenditure and carry-forward losses.

Davidson & Company is the leading auditor for FTS issuers in terms of the number of engagements, audit fees and total fees, and has more than double the number of FTS issuing clients compared to second-place PricewaterhouseCoopers (PwC). The results of matched univariate testing and a matched OLS regression indicate FTS issuing MEEs pay lower audit fees than their non-FTS issuing counterparts. Since MEEs have unique

characteristics which render them complex to audit, this result could suggest auditors have adopted efficient practices to manage the FTS component of MEE audits, and/or the risk mitigation provided by the FTS framework reduces the going concern risk and inherent risk of the auditee. Big 4 firms are found to charge premiums for conducting a brand name MEE audit, however charge relatively lower fees to audit FTS issuing MEEs compared to non-issuers. This could represent a strategy to expand FTS market share. Amongst the sample of FTS issuers, Davidson & Company (the market leader) and Big 4 firms are identified as applying industry leader premiums when pricing audit services, and evidence suggests these firms charge a premium on audits as a means of generating higher fees given the magnitude of audit fees is much higher than non-audit service fees.

5.4 Conclusion

This research has many practical implications for listed mining firms, investors and policymakers, and contributes to the extant academic literature. The research is important in assisting listed Canadian MEEs to understand FTS as a form of equity offering. Since MEEs experience difficulty raising capital, FTS provide an opportunity to raise the necessary capital for growth and development by alleviating the agency problems associated with information asymmetry and providing investors with tax-effective exposure to mining project upside.

This research is also of interest to policymakers both in Canada and abroad. Canadian policymakers benefit through an increased understanding of the impact of the FTS program on capital markets and their economic significance, investor perceptions and how the program can be improved. International policymakers (such as those in Australia) can benefit from this research from an industry investment and

implementation perspective, given their interest in boosting investment in particular industries.

As limited academic work has been published examining FTS to date, this research contributes to the extant literature in three key ways. Firstly, this thesis broadens the literature regarding security issues by providing analysis on FTS as another form of SEO. Specifically, it sheds light on the determinants of the FTS issuance premium which generally does not conform to the pattern of SEO discounting observed amongst most types of SEO. It also investigates factors affecting the share price reaction to the announcement of an FTS placement, thus extending the literature pertaining to market reactions to SEO announcements. Finally, it also extends the audit pricing literature by examining the impact of FTS issuance on audit fees. The TSXV exchange from which the sample is drawn has not featured in published research to date. This exchange is an example of a second-tier exchange which is a topical feature of the recent venture capital literature, particularly in relation to the role of such exchanges in the development of entrepreneurial public markets.

This thesis is subject to two primary limitations. An ongoing theme of this research pertains to the tax benefits afforded by FTS, the extent of which is likely to be dependent on the marginal tax rates of individual FTS investors along with their provincial tax residency status. Neither of these variables are observable and thus cannot be measured. Data availability represents another limitation which inhibits this research. The most prevalent example of this relates to the availability of firm-year data pertaining to exploration and evaluation assets (including project locations and commodity focus of Canadian mineral properties). This data is hand-collected from the firm financial reports; a process limited by time constraints. As a result, only a subsample equivalent to 20% of the entire sample of FTS deals could be tested in Chapter 2. Another case of data

limitations relates to partner sign-off of audit reports. This data is unavailable with respect to Canadian firms. As such, it is unclear whether audit office-level fee discounts are in fact driven by underlying partner concentration and/or specialisation effects.

There are several opportunities for future research in the FTS space. Initially, this could involve expanding upon the subsample testing conducted in Chapter 2 by collecting a complete dataset pertaining to Canadian exploration and evaluation assets. This will allow a larger sample of FTS deals to be examined in relation to the FTS issuance premium. Additional avenues for research could include examining audit quality amongst FTS issuing auditees and the long-run performance of FTS issuers.

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