TAKING STOCK: HEALTH OF CANADIAN PUBLIC EQUITY MARKETS

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ABSTRACT

In *The U.S. listing gap*, Doidge, Karolyi & Stulz reported that the number of listed firms in the United States is now lower than expected. This paper considers whether a similar listing gap is present in Canada. Listing data and census data was processed and analysed with three questions in mind: (1) How has the number of firms listed in Canada changed over time? (2) How has the listing propensity for a Canadian firm changed over time? (3) How have annual new listings and de-listings in Canada changed over time? The results indicate that the number of listed firms in Canada has decreased over time, the listing propensity for a Canadian firm has decreased over time, the annual number of new listings in Canada has decreased over time and the annual number of de-listings in Canada has increased over time. Mixed together, these results point to the conclusion that Canada has a listing gap.

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1 INTRODUCTION

In *The U.S. listing gap*, Doidge, Karolyi & Stulz observed that the number of listed firms in the United States (US) has declined relative to the listing counts in other countries. In other words, the number of listed firms in the US is now lower than expected. This "listing gap" is reflected both in an abnormally low propensity for a US firm to be listed and in an abnormally high de-list rate for US firms.

The purpose of this paper is to consider whether Canada has a similar listing gap. There are three questions that tie into this topic: (1) How has the number of firms listed on the Toronto Stock Exchange (TSX) changed over time? (2) How has the listing propensity for a Canadian firm changed over time? (3) How have annual listings and de-listings on the TSX changed over time?

2 THE NUMBER OF FIRMS LISTED ON THE TSX

2.1 Data

Listing count data was pulled from the Canadian Financial Markets Research Centre (CFMRC), which is part of the CHASS Data Centre at the University of Toronto. The listing count data contained monthly inventories of the stocks trading on the TSX. The CFMRC listing count data started in 1977 and ended in 2020. The raw form of the CFMRC listing count data is shown in Table 1 below.

Table 1: Raw form of TSX listing count data from the CFMRC.

trdate-Trade Date	**symbol-Ticker**	**name-Name**	**business-Business**	**stock_type-Stock Type**
01/31/1977	A	ABITIBI INC.	NEWSPRINT PAPER	Common Stock
02/28/1977	A	ABITIBI INC.	NEWSPRINT PAPER	Common Stock

Here, *trdate-Trade Date* is the date of observation, *symbol-Ticker* is the stock ticker, *name-Name* is the name of the issuer, *business-Business* is the business of the issuer and *stock_type-Stock Type* is the type of security observed. There were roughly 1 million observations in the listing count data.

2.2 Methods

2.2.1 Data Processing

The listing count data was processed and cleaned in R. First, observations of securities that belonged to mutual funds, investment funds, investment companies and investment trusts were excluded by way of a filter on *business-Business*. Second, observations of securities that were ETFs and notes were excluded by way of a filter on *name-Name*. Third, observations of preferred stock were excluded by way of a filter on *stock_type-Stock Type*. Fourth, tickers were reduced to their roots (*e.g.*, ABC.A and ABC.B became two separate observations of ABC). This was done by separating symbol-Ticker into two columns, one for the text before the "." in a ticker (if any) and one for the text after the "." in a ticker (if any). If there was no "." in a ticker, the first column was populated by the original text in the symbol-Ticker column, and the second column was recorded as N/A. Fifth, tickers were collapsed such that no duplicate tickers could occur in the same month (*e.g.*, if there were originally two ABCs in December 1990, they were collapsed into one ABC for that month-year combination). This was done to avoid double counting.

2.2.2 Listing Counts

The number of firms listed on the TSX each year was derived from the cleaned-up listing count data. This involved taking a snapshot at the end of each month for every year of data, where the number of firms listed at the end of each month was assumed to be equal to the frequency of each month-year combination. For example, there were 887 observations on December 30, 1977, meaning there were approximately 887 operating firms listed on the TSX on that date. This assumption was made possible by the data cleaning described above — there were no duplicates in the data, for example.

2.3 Results

The TSX listing counts from 1977 to 2020 are shown in Table 2 below.

Table 2: The number of operating firms listed on the TSX from 1977 to 2020.

Month	Day	Year	Number of Listed Firms
12	30	1977	887
12	29	1978	843
12	31	1979	811
12	31	1980	809
12	31	1981	842

12	31	1982	826
12	30	1983	869
12	31	1984	917
12	31	1985	920
12	31	1986	1027
12	31	1987	1143
12	30	1988	1142
12	29	1989	1133
12	31	1990	1119
12	31	1991	1065
12	31	1992	1041
12	31	1993	1109
12	30	1994	1164
12	29	1995	1154
12	31	1996	1223
12	31	1997	1302
12	31	1998	1326
12	31	1999	1344
12	29	2000	1304
12	31	2001	1208
12	31	2002	1175
12	31	2003	1174
12	31	2004	1227
12	30	2005	1297
12	29	2006	1327
12	31	2007	1340
12	31	2008	1277
12	31	2009	1164
12	31	2010	1152
12	30	2011	1143
12	31	2012	1086
12	31	2013	1037
12	31	2014	971
12	31	2015	917
12	30	2016	864
12	29	2017	828
12	31	2018	804
12	31	2019	788
12	31	2020	758

The listing counts on the TSX peaked at 1,344 in 1999 before falling to 758 in 2020. This rise-and-fall sequence is similar to the pattern of US listing counts observed by Doidge et al in *The U.S. listing gap*. However, one important distinction is that the decline in the TSX listing count was slower than the decline in US listings — specifically, the

TSX listing count only fell below 1970s levels in 2017, whereas the US listing count fell below 1970s levels in 2010.

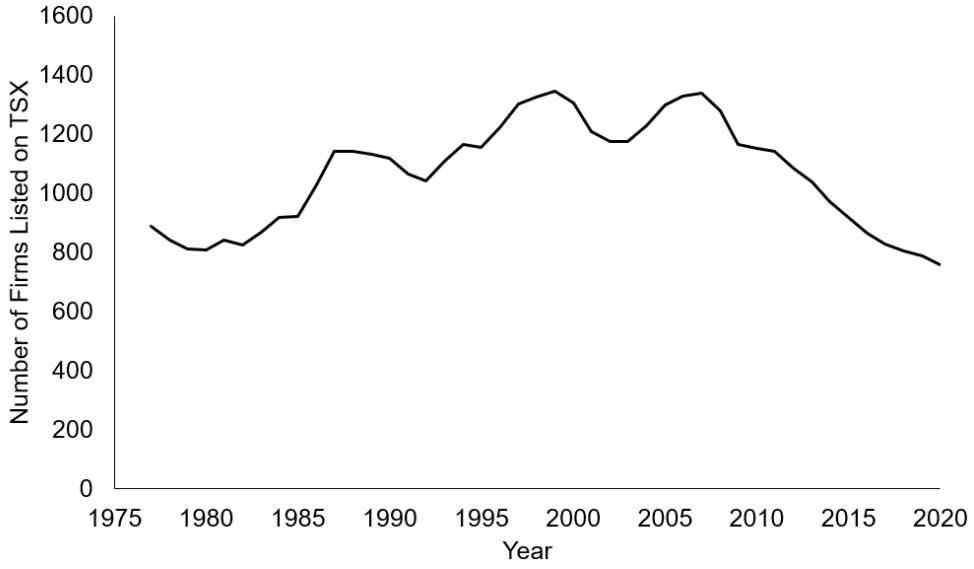

Figure 1: The number of operating firms listed on the TSX from 1977 to 2020.

The listing count pattern between 2003 and 2007 – which can be seen in Figure 1 above – is notable. During that period, TSX listing counts rebounded in the middle of a sharp decline. This rebound peaked in 2007 at 1,340 listings — the highest listing count since 1999. After the 2008 financial crisis, TSX listing counts started to fall again. The US markets followed a similar pattern – US listing counts exited a sharp decline around 2003 and remained relatively flat before declining post-2007. This suggests that the cause of the TSX rebound had some positive effect on US equity markets, or vice versa. Alternatively, the general state of global equity markets might have been favourable for new listings, or might have discouraged firms from de-listing.

3 CANADIAN LISTING PROPENSITY

3.1 Data

The listing propensity data had two components: (1) business count data and (2) TSX listing count data.

The business count data was pulled from Statistics Canada, which provides end-of-year national counts of businesses across various employment-size categories. These counts are compiled by Statistics Canada using the Business Register. From 1988 to 2014, the business count database

was called Canadian Business Patterns. Since 2015, the business count database has been called Canadian Business Counts.

The TSX listing count data is the same listing count data that was discussed in the previous section (*i.e.*, the CFMRC TSX listing count data).

3.2 Methods

3.2.1 Compiling Data

National business count data for each December from 1988 to 2019 was converted from ".ivt" to ".csv" format and then compiled using R. The business count data was kept in its original structure (*i.e.*, end-of-year national counts of businesses across various employment-size categories).

3.2.2 Listing Propensity

Doidge et al defined listing propensity as the number of listed firms (excluding firms with less than 20 employees) divided by the number of national firms (excluding firms with less than 20 employees). Here, listing propensity is defined as the number of listed firms divided by the number of national firms (excluding firms with less than 20 employees). Listed firms with less than 20 employees could not be excluded in the numerator because the CFMRC TSX listing count data does not provide employee counts.

This mismatch between the listing propensity numerator and denominator means that each listing propensity value will only be a rough estimate of the actual listing propensity in Canada. Nonetheless, this approach is reasonable for present purposes, since the time series trend is in and of itself informative.

3.3 Results

The total number of active firms in Canada and listing propensity are shown in Table 3 below. Listing propensity peaked in 1988 and 1989 at 1.22% and hit its low in 2019 at 0.46%. In terms of general trends, listing propensity has gradually declined since 1988. Predictably, there are sharp drops in listing propensity around the 2000 and 2008 market crashes.

Table 3: Business counts in Canada across employment-size categories from 1988 to 2019. A is firms with 20 to 49 employees, B is firms with 50 to 99 employees, C is firms with 100 to 199 employees, D is firms with 200 to 499 employees and E is firms with 500+ employees.

	A	B	C	D	E	Total	Propensity
1988	58,262	18,985	9,361	4,718	2,502	93,828	1.22%
1989	57,856	18,838	9,213	4,543	2,381	92,831	1.22%
1990	58,903	19,167	9,407	4,518	2,278	94,273	1.19%
1991	57,620	18,561	9,180	4,464	2,317	92,142	1.16%
1992	67,609	20,889	10,101	4,635	2,252	105,486	0.99%
1993	68,445	20,809	99,84	4,511	2,254	106,003	1.05%
1994	69,424	21,313	98,82	4,657	2,341	107,617	1.08%
1995	70,862	21,924	10,178	4,683	2,322	109,969	1.05%
1996	72,902	22,650	10,419	4,960	2,335	113,266	1.08%
1997	84,437	25,053	11,218	5,189	2,411	128,308	1.01%
1998	78,690	24,431	11,154	5,123	2,373	121,771	1.09%
1999	82,376	26,588	11,557	5,030	2,305	127,856	1.05%
2000	86,655	31,081	14,467	6,396	2,753	141,352	0.92%
2001	84,633	30,924	14,428	6,582	2,746	139,313	0.87%
2002	88,129	31,857	14,742	6,842	2,759	144,329	0.81%
2003	86,918	30,420	14,246	6,793	2,738	141,115	0.83%
2004	90,436	31,323	14,791	7,223	2,860	146,633	0.84%
2005	90,160	31,819	15,052	7,576	3,047	147,654	0.88%
2006	89,974	31,748	15,303	7,718	3,149	147,892	0.90%
2007	85,217	29,260	13,584	6,961	2,904	137,926	0.97%
2008	84,643	28,644	13,375	6,748	3,026	136,436	0.94%
2009	91,983	29,457	13,337	6,661	2,768	144,206	0.81%
2010	92,292	29,420	13,147	6,483	2,708	144,050	0.80%
2011	90,604	28,801	13,025	5,974	2,528	140,932	0.81%
2012	95,014	30,649	13,780	6,520	2,626	148,589	0.73%
2013	99,685	32,176	13,830	6,585	2,731	155,007	0.67%
2014	102,880	33,114	14,645	7,235	2,966	160,840	0.60%
2015	104,995	33,868	14,492	7,214	2,977	163,546	0.56%
2016	102,863	34,274	14,559	7,186	2,999	161,881	0.53%
2017	103,251	34,381	15,133	7,219	2,994	162,978	0.51%
2018	104,610	35,249	15,421	7,461	3,025	165,766	0.49%
2019	108,114	36,103	15,693	7,334	2,984	170,228	0.46%

As mentioned above, the asymmetry in the listing propensity definition used here undermines the importance of individual listing propensity values. Instead, it is the year-to-year listing propensity trend – shown in Figure 2 below – that deserves close attention.

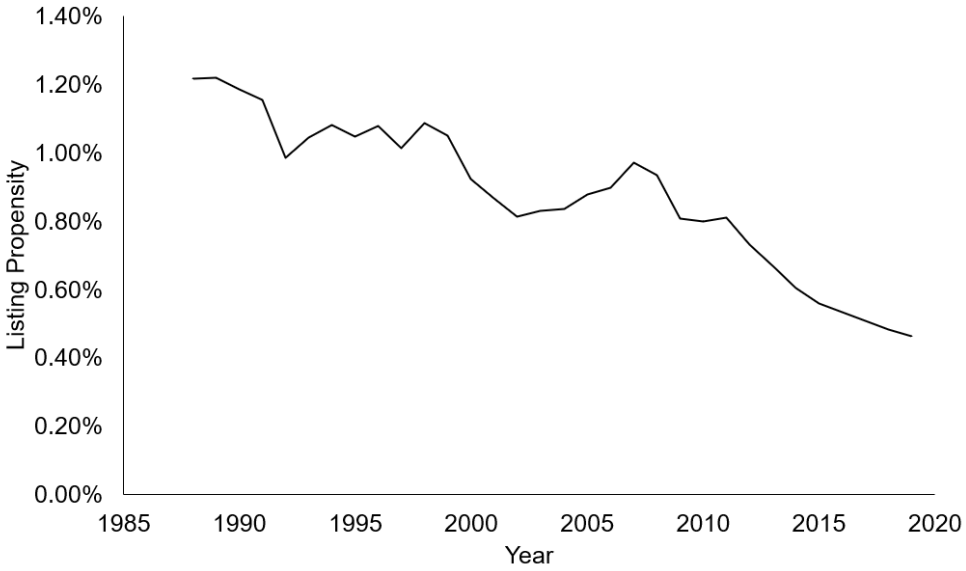

Figure 2: The listing propensity in Canada from 1988 to 2019.

There is a meaningful amount of coherence between the Canadian listing propensity trend and the US listing propensity trend that was reported in Doidge et al. In particular, both the Canadian and US trends show (i) a decrease in listing propensity after 1988; (ii) an increase in listing propensity after 1992; and (iii) a decrease in listing propensity after 2008, with no meaningful recovery or rebound. This suggests that the same forces were informing both Canadian and US listing decisions.

4 TSX NEW LISTINGS AND DE-LISTINGS

4.1 Data

Listing change data was pulled from the CFMRC – the same source as the listing count data. The listing change data contained a list of every new listing and de-listing that has taken place on the TSX since 1905. The raw form of the CFMRC listing change data is shown in Table 4 below.

Table 4: Raw form of TSX listing change data from CFMRC.

SYMBOL	CO_NAME	CO_LST_DT	CO_DLST_DT
A	Abitibi-Consolidated Inc.	1965-12-01	2007-10-29
AAA	Allana Potash Corp.	2011-09-09	2015-06-25

Here, *SYMBOL* is the stock ticker, *CO_NAME* is the name of the issuer, *CO_LST_DT* is the issuer's listing date and *CO_DLST_DT* is the issuer's de-listing date, if applicable. There were roughly 100,000 observations in the listing change data.

4.2 Methods

4.2.1 Data Processing

The listing change data was processed and cleaned in R. First, tickers were reduced to their roots (*e.g.*, ABC.A and ABC.B became two separate observations of ABC). This was done by separating *SYMBOL* into two columns, one for the text before the "." in a ticker (if any) and one for the text after the "." in a ticker (if any). If there was no "." in a ticker, the first column was populated by the original text in the symbol-Ticker column, and the second column was recorded as N/A. Second, tickers were collapsed such that no duplicate ticker listing changes could occur in the same year (*e.g.*, if there were two ABCs de-listed in 1990, they were collapsed into one ABC de-listing for that year). This was done to avoid double counting within each year. Third, tickers were collapsed again – this time, any ticker that showed a new listing on the TSX subsequent to its initial listing, but before it had been de-listed, was deleted (*e.g.*, if ABC initially listed in 1965, then reported another listing in 1970, yet only de-listed in 1990, the 1970 listing was deleted). This was done to avoid double counting secondary listings that occurred subsequent to a firm's initial listing. Fourth, each ticker and firm name combination in the listing change data was matched to an identical ticker and firm name combination in the listing count data. If there was no identical match in the listing count data, the listing change observation was deleted. This ensured that the listing change data was consistent with the listing count data. This also imported the filter that was applied to the listing count data (*e.g.*, mutual funds, investment funds, preferred stock, were excluded).

4.2.2 New Listing Counts and De-Listing Counts

Annual new listings and de-listings were derived from the cleaned-up listing change data. Specifically, the number of listings on the TSX each year was assumed to be equal to the frequency of each listing year. For example, there were 13 observations with a listing year of 1965, meaning there were approximately 13 listings in 1965. The same approach was used for counting annual de-listings. And like with the listing count data, this assumption was made possible by the data cleaning described above.

4.2.3 De-Listing Rate

De-listing rates were calculated as the number of de-listings in a given year divided by the number of firms listed on the TSX at the end of the prior year. That is, the de-listing rate was taken to be the number of de-listings in year T+1 divided by the number of firms listed on the TSX at the end of year T (*i.e.*, the number of firms listed on the TSX at the beginning of year T+1). De-listing rates were only calculated for the years after 1987, since de-listings were too sporadic to be meaningful pre-1988.

4.3 Results

The annual new listings and de-listings for the TSX from 1977 to 2020 are shown in Table 5 below. The results show that new listings peaked on the TSX in 2005 at 149 and reached a minimum in 1977 at 1. Meanwhile, de-listings peaked at 135 in 2009, and another notable spike in de-listings occurred in 2001.

Table 5: Number of new listings and de-listings on the TSX.

Year	New Listings	De-Listings
1977	1	N/A
1978	2	N/A
1979	19	N/A
1980	19	N/A
1981	33	N/A
1982	23	N/A
1983	55	N/A
1984	60	N/A
1985	41	1
1986	106	N/A
1987	114	19
1988	54	43
1989	42	41
1990	33	41
1991	23	58
1992	41	51
1993	101	43
1994	96	41
1995	69	40
1996	124	62
1997	140	55
1998	88	62
1999	118	84
2000	77	96

2001	61	112
2002	69	81
2003	79	68
2004	137	83
2005	149	80
2006	145	97
2007	134	113
2008	74	117
2009	41	135
2010	99	89
2011	84	89
2012	50	99
2013	47	84
2014	42	96
2015	30	85
2016	32	79
2017	39	74
2018	30	61
2019	27	44
2020	32	59

Figure 3 below illustrates the year-to-year trend of TSX new listing and de-listing activity. Notably, new listing activity has not recovered from the 2008 market crash. In addition, the trend suggests that new listing and de-listing decisions stem from the same market factors – when new listings increase, de-listings decrease, and vice versa. Interestingly, though, both new listings and de-listings have been decreasing since the 2008 market crash.

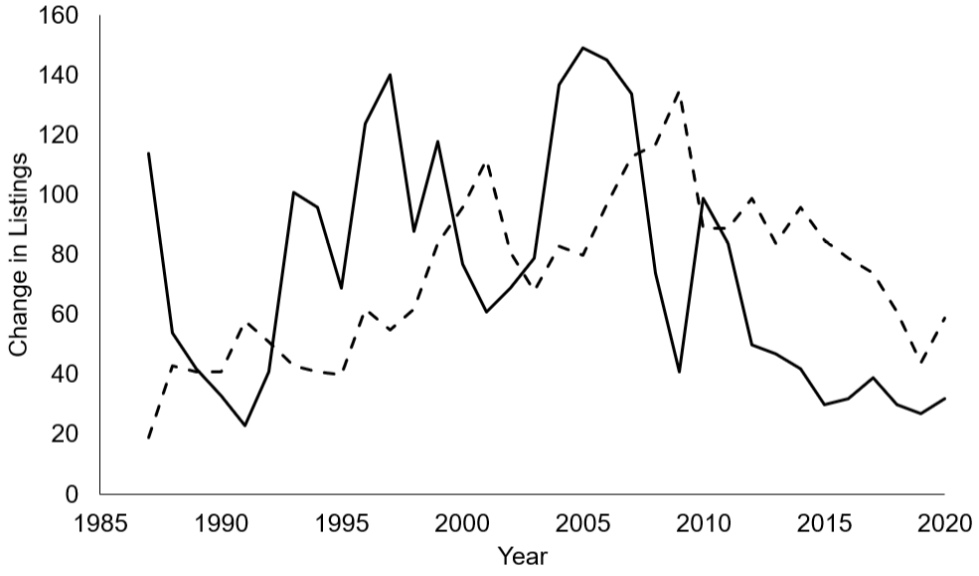

Figure 3: The number of new listings (solid line) and de-listings (dashed line) on the TSX from 1988 to 2020.

The de-listing rates for the TSX in each year from 1988 to 2020 are shown in Table 6 below. The results show that the TSX de-listing rate peaked at 10.6% in 2009 and reached a minimum of 3.4% in 1995. Consistent with the de-listing activity discussed above, TSX de-listing rates have pronounced spikes around the 2000 and 2008 market crashes.

Table 6: De-listing rates on the TSX.

Year	Number of Listed Firms	De-Listings	De-Listing Rate
1988	1142	43	3.8%
1989	1133	41	3.6%
1990	1119	41	3.6%
1991	1065	58	5.2%
1992	1041	51	4.8%
1993	1109	43	4.1%
1994	1164	41	3.7%
1995	1154	40	3.4%
1996	1223	62	5.4%
1997	1302	55	4.5%
1998	1326	62	4.8%
1999	1344	84	6.3%
2000	1304	96	7.1%
2001	1208	112	8.6%
2002	1175	81	6.7%
2003	1174	68	5.8%
2004	1227	83	7.1%
2005	1297	80	6.5%
2006	1327	97	7.5%
2007	1340	113	8.5%
2008	1277	117	8.7%
2009	1164	135	10.6%
2010	1152	89	7.6%
2011	1143	89	7.7%
2012	1086	99	8.7%
2013	1037	84	7.7%
2014	971	96	9.3%
2015	917	85	8.8%
2016	864	79	8.6%
2017	828	74	8.6%
2018	804	61	7.4%
2019	788	44	5.5%
2020	758	59	7.5%

Figure 4 below illustrates the year-to-year trend of TSX de-listing rates. Most significantly, there has been a steady increase in the de-listing rate for TSX issuers since 1988. But this trend seems to be changing – indeed, the TSX de-listing rate has fallen since 2015. One possible explanation is that the 2008 market crash reduced the number of low-quality issuers on the TSX, meaning the remaining TSX issuers are less likely to de-list. Another possible explanation is that market conditions have significantly improved, which in turn has increased issuer retention on the TSX. Either way, the current trend suggests that TSX de-listing rates will continue to hover around levels that are far higher than pre-2000 TSX de-listing rates.

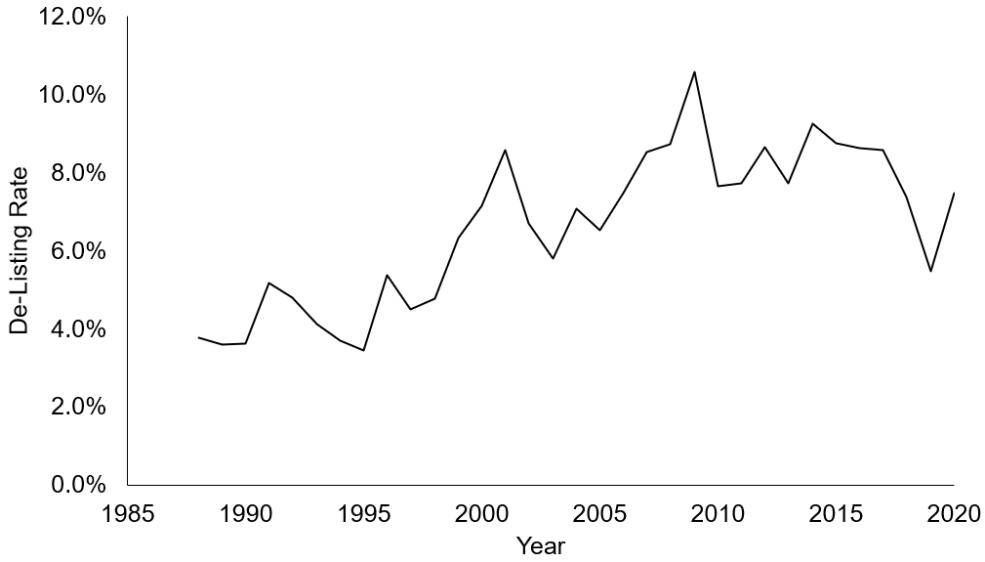

Figure 4: The de-listing rate for firms listed on the TSX from 1988 to 2020.

5 CONCLUSION: THE CANADIAN LISTING GAP

Recall that the central question in this paper is whether Canada has a listing gap that is similar to the US listing gap. In light of the data and results discussed in this paper, the answer to that central question appears to be yes – there is a Canadian listing gap.

This conclusion is best illustrated by deriving a hypothetical post-2008 TSX listing count that highlights the effect of the increase in the TSX de-listing rate. This involves applying a pre-2007 de-listing rate to determine hypothetical post-2008 TSX de-listings, such that the sum of the hypothetical post-2008 TSX de-listings and the actual post-2008 TSX new listings yields the hypothetical change in post-2008 TSX listing counts.

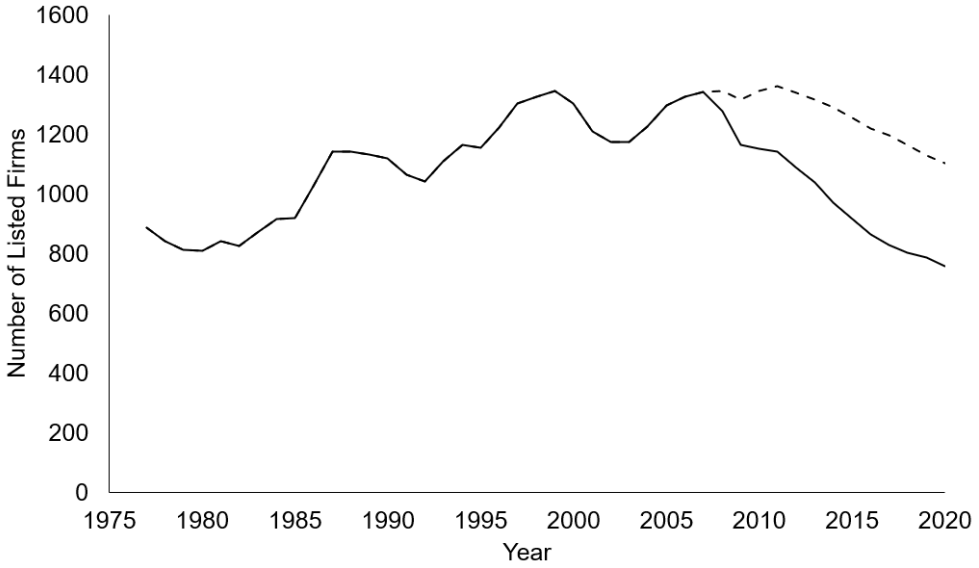

Figure 5: The Canadian listing gap. A comparison between the actual TSX listing count (solid line) and the hypothetical TSX listing count, which was derived using a pre-2007 TSX de-listing rate (dashed line).

A comparison between the hypothetical TSX listing count and the actual TSX listing count is shown in Figure 5 above. As the trend illustrates, the rise in TSX de-listing rates has driven a serious reduction in TSX listings. Of course, changes in the rate of new listings on the TSX would be relevant to this gap, too. Furthermore, details such as the reason for de-listing and the employment-size of each issuer would help shed more light on this trend.

Nonetheless, Figure 5 demonstrates that the market events in 2008 have had a lasting effect on Canadian listing dynamics. The effect of the 2008 market crash is also reflected in the other results presented in this paper. Indeed, there has been a decrease in the number of issuers listed on the TSX (Figure 1), a decrease in Canadian listing propensity (Figure 2), a decrease in annual new listings on the TSX, an increase in annual de-listings on the TSX (Figure 3) and an increase in the TSX de-listing rate (Figure 4).