EQUICAPITA

PORTFOLIO CONSTRUCTION USING CANADIAN SME INVESTMENT ALLOCATIONS

ABSTRACT: A review of the Canadian SME market over the last 35 years reveals: an exposure to SME investments would have improved the financial performance of model portfolios; a realized volatility that was lower than stocks; a realized return that was greater than bonds; and a low correlation to traditional financial asset returns. The author also believes that domestic institutional investors are under-invested relative to efficient frontier analysis.

KEYWORDS: SME, equities, bonds, efficient investment, investment portfolio, portfolio performance, pension plan, institutional investment, commercial real estate

INTRODUCTION: In the current zero interest rate policy "ZIRP" environment, investors are increasingly looking to less traditional asset classes to generate returns. One such asset class that has been the beneficiary of this push into alternatives in the last decade is private SMEs. We believe this is warranted as our research supports the conclusion that SME investments can materially improve portfolio performance and institutional investors are under-invested in this asset class relative to other portfolio allocations. The following is a survey of abstracts from relevant research papers in the area:

Lamm and Ghaleb-Harter (2001) Abstract: *"Our basic conclusions are that investors are well advised to make substantial allocations to private equity, even in uncertain investment environments. These range from 10% to more than 30%, depending on the investor's risk appetite. Importantly, these findings hold up under a variety of different assumptions. The payoff from private equity exposure arises from portfolio diversification benefits and the unique characteristics of the asset class"*

Rudin, Mao, Zhang and Fink (2019) Abstract: *"By applying a somewhat novel econometric technique to a proprietary dataset, we offer a way to separately estimate systematic and idiosyncratic risks of private equity (PE) programs. Our methodology controls for data overfitting and program concentration. Observed volatility and equity beta of PE are much lower than that of public equity. We believe this is not an aberration but instead a fundamental consequence of PE being less exposed to the excess volatility of public equity markets. With the exception of the tumultuous period of the global financial crisis (GFC), risk properties of private equity have been surprisingly persistent; if anything, systematic risks of private equities decreased slightly after the GFC."*

DISCUSSION OF RESULTS: This paper analyzes the efficient frontier effects of the addition of SME to three portfolio configurations over multiple time series. In summary SME exposure consistently demonstrates:

1. Competitive returns: Equicapita's SME Buyout Fund generated an average annual return of approximately 12% from 2013 to 2019. This is higher than the same period return of 5.3% and the 10- year average return of 4.4% for the S&P/TSX Composite Index. Based on the Sharpe ratio, SME investments have given a superior return for the same amount of risk compared to most asset classes.

2. Portfolio diversification: SME portfolios can be created to achieve varying diversification objectives utilizing provincial exposure, industry size relative to GDP, correlation and volatility, which provides diversification benefits to its investors.

3. Generation of income: SME investments help in generating income for investors through the distribution high-quality cash flows generated from businesses that demonstrated a strong history of providing returns. As lower valuations are typically experienced in the SME market, investors can achieve higher expected returns without the injection of significant resources.

From the period data, we generated efficient frontiers adding SME investment exposure consistent with Equicapita's SME profile.

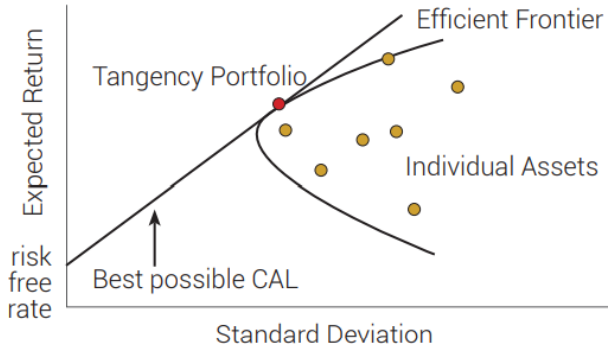
"The efficient frontier (or portfolio frontier) is a concept in modern portfolio theory introduced by Harry Markowitz in 1952. It refers to investment portfolios which occupy the 'efficient' parts of the risk-return spectrum. Formally, it is the set of portfolios which satisfy the condition that no other portfolio exists with a higher expected return but with the same standard deviation of return. A combination of assets, i.e. a

portfolio, is referred to as "efficient" if it has the best possible expected level of return for its level of risk (which is represented by the standard deviation of the portfolio's return). Here, every possible combination of risky assets can be plotted in risk–expected return space, and the collection of all such possible portfolios defines a region in this space. In the absence of the opportunity to hold a risk-free asset, this region is the opportunity set (the feasible set). The positively sloped (upward-sloped) top boundary of this region is a portion of a parabola and is called the "efficient frontier.

If a risk-free asset is also available, the opportunity set is larger, and its upper boundary, the efficient frontier, is a straight-line segment emanating from the vertical axis at the value of the risk-free asset's return and tangent to the risky-assets-only opportunity set. All portfolios between the risk-free asset and the tangency portfolio are portfolios composed of risk-free assets and the tangency portfolio, while all portfolios on the linear frontier above and to the right of the tangency portfolio are generated by borrowing at the risk-free rate and investing the proceeds into the tangency portfolio." Source Wikipedia

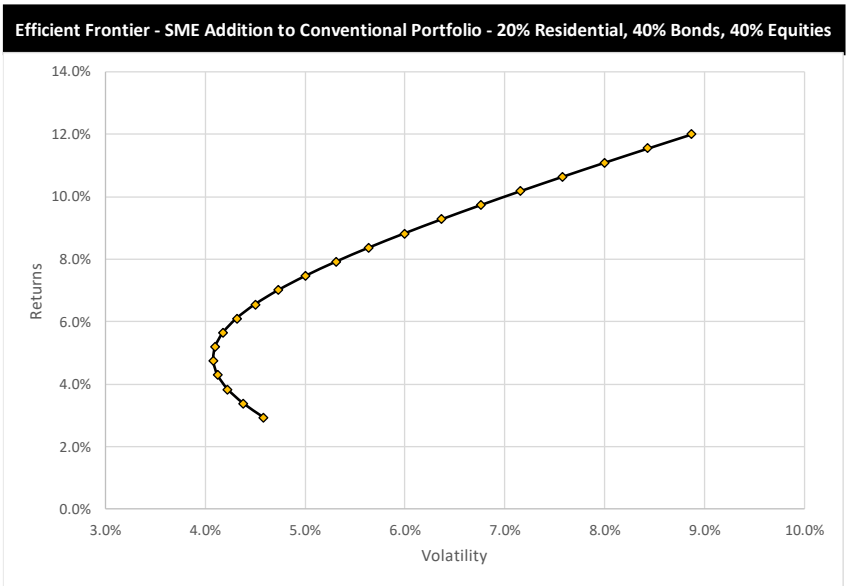
The time series we utilized are 35, 30, 20 and 10 years. We measured multiple periods with a view to exposing potential shifts in risk/return profiles over time. We used three portfolio configurations to represent distinct investor risk profiles, with "Medium" risk being a typical 20/40/40 real estate/bond/public equity allocation:

- Lower Risk – 20% real estate / 60% bonds / 20% equities
- Medium Risk – 20% real estate / 40% bonds / 40% equities
- Higher Risk – 100% listed equities



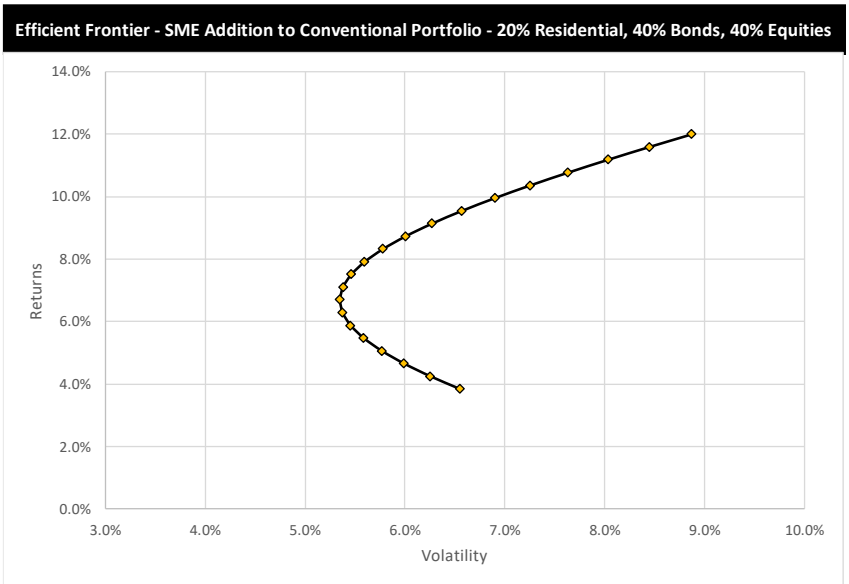
SOURCE DATA AND ANALYSIS:

1. Efficient Frontiers for Conventional Portfolio – 20% Real Estate, 40% Bonds and 40% Equities – with allocation of diversified SME portfolio returns: 10 years (2010-2019)[1]



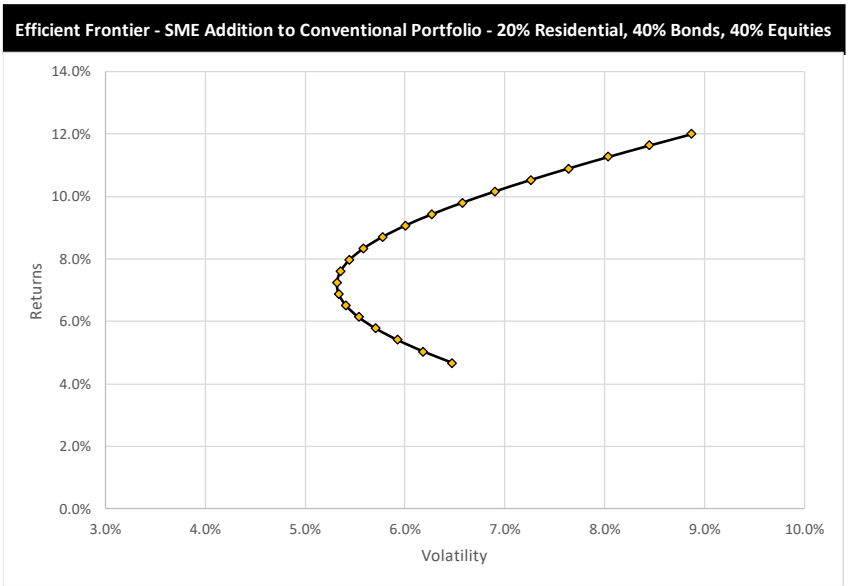
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	2.9%	0.00210	4.6%
5%	95%	3.4%	0.00192	4.4%
10%	90%	3.8%	0.00179	4.2%
15%	85%	4.3%	0.00170	4.1%
20%	80%	4.7%	0.00167	4.1%
25%	75%	5.2%	0.00168	4.1%
30%	70%	5.6%	0.00175	4.2%
35%	65%	6.1%	0.00186	4.3%
40%	60%	6.6%	0.00203	4.5%
45%	55%	7.0%	0.00224	4.7%
50%	50%	7.5%	0.00250	5.0%
55%	45%	7.9%	0.00282	5.3%
60%	40%	8.4%	0.00318	5.6%
65%	35%	8.8%	0.00359	6.0%
70%	30%	9.3%	0.00405	6.4%
75%	25%	9.7%	0.00457	6.8%
80%	20%	10.2%	0.00513	7.2%
85%	15%	10.6%	0.00574	7.6%
90%	10%	11.1%	0.00640	8.0%
95%	5%	11.5%	0.00711	8.4%
100%	0%	12.0%	0.00787	8.9%

2. Efficient Frontiers for Conventional Portfolio – 20% Real Estate, 40% Bonds and 40% Equities – with allocation of diversified SME portfolio returns: 20 years (2000-2019)[1]



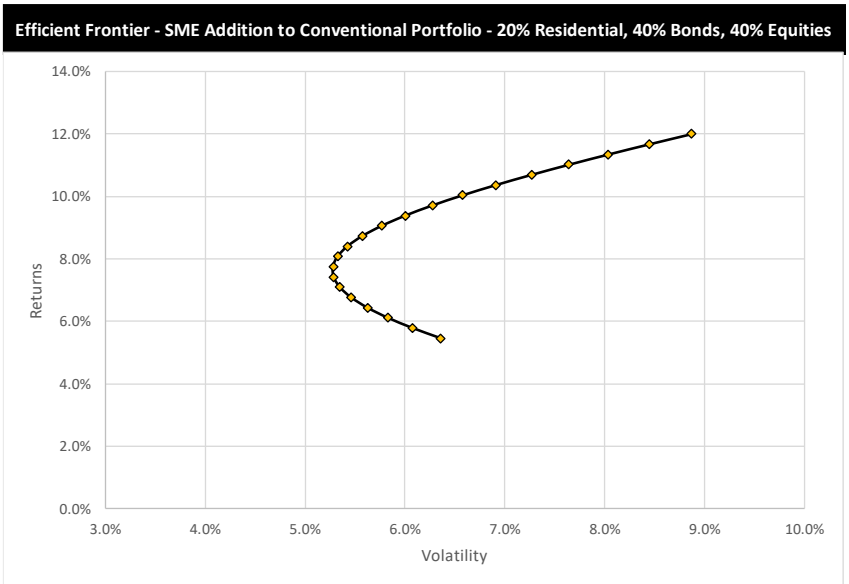
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	3.8%	0.00430	6.6%
5%	95%	4.2%	0.00391	6.3%
10%	90%	4.7%	0.00359	6.0%
15%	85%	5.1%	0.00333	5.8%
20%	80%	5.5%	0.00312	5.6%
25%	75%	5.9%	0.00298	5.5%
30%	70%	6.3%	0.00289	5.4%
35%	65%	6.7%	0.00286	5.3%
40%	60%	7.1%	0.00289	5.4%
45%	55%	7.5%	0.00298	5.5%
50%	50%	7.9%	0.00313	5.6%
55%	45%	8.3%	0.00334	5.8%
60%	40%	8.7%	0.00361	6.0%
65%	35%	9.1%	0.00393	6.3%
70%	30%	9.6%	0.00432	6.6%
75%	25%	10.0%	0.00476	6.9%
80%	20%	10.4%	0.00527	7.3%
85%	15%	10.8%	0.00583	7.6%
90%	10%	11.2%	0.00645	8.0%
95%	5%	11.6%	0.00713	8.4%
100%	0%	12.0%	0.00787	8.9%

3. Efficient Frontiers for Conventional Portfolio – 20% Real Estate, 40% Bonds and 40% Equities – with allocation of diversified SME portfolio returns: 30 years (1990-2019)[1]



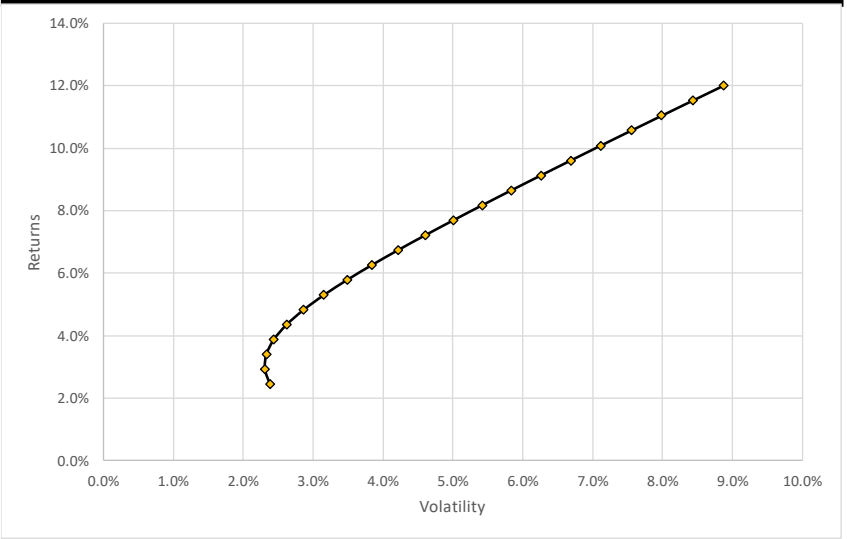
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	4.7%	0.00419	6.5%
5%	95%	5.0%	0.00382	6.2%
10%	90%	5.4%	0.00351	5.9%
15%	85%	5.8%	0.00326	5.7%
20%	80%	6.1%	0.00307	5.5%
25%	75%	6.5%	0.00293	5.4%
30%	70%	6.9%	0.00285	5.3%
35%	65%	7.2%	0.00283	5.3%
40%	60%	7.6%	0.00287	5.4%
45%	55%	8.0%	0.00297	5.4%
50%	50%	8.3%	0.00312	5.6%
55%	45%	8.7%	0.00333	5.8%
60%	40%	9.1%	0.00361	6.0%
65%	35%	9.4%	0.00394	6.3%
70%	30%	9.8%	0.00432	6.6%
75%	25%	10.2%	0.00477	6.9%
80%	20%	10.5%	0.00527	7.3%
85%	15%	10.9%	0.00583	7.6%
90%	10%	11.3%	0.00645	8.0%
95%	5%	11.6%	0.00713	8.4%
100%	0%	12.0%	0.00787	8.9%

4. Efficient Frontiers for Conventional Portfolio – 20% Real Estate, 40% Bonds and 40% Equities – with allocation of diversified SME portfolio returns: 35 years (1985-2019)[1]



SME PE	Portfolio	Return	Variance	STD DV
0%	100%	5.5%	0.00404	6.4%
5%	95%	5.8%	0.00369	6.1%
10%	90%	6.1%	0.00340	5.8%
15%	85%	6.4%	0.00316	5.6%
20%	80%	6.8%	0.00298	5.5%
25%	75%	7.1%	0.00286	5.4%
30%	70%	7.4%	0.00280	5.3%
35%	65%	7.7%	0.00279	5.3%
40%	60%	8.1%	0.00284	5.3%
45%	55%	8.4%	0.00294	5.4%
50%	50%	8.7%	0.00311	5.6%
55%	45%	9.1%	0.00333	5.8%
60%	40%	9.4%	0.00360	6.0%
65%	35%	9.7%	0.00394	6.3%
70%	30%	10.0%	0.00433	6.6%
75%	25%	10.4%	0.00478	6.9%
80%	20%	10.7%	0.00528	7.3%
85%	15%	11.0%	0.00584	7.6%
90%	10%	11.3%	0.00646	8.0%
95%	5%	11.7%	0.00714	8.4%
100%	0%	12.0%	0.00787	8.9%

5. Efficient Frontiers for Low Risk Portfolio – 20% Real Estate, 60% Bonds, 20% Equities – with allocation of diversified SME portfolio returns: 10 years (2010-2019)[1]

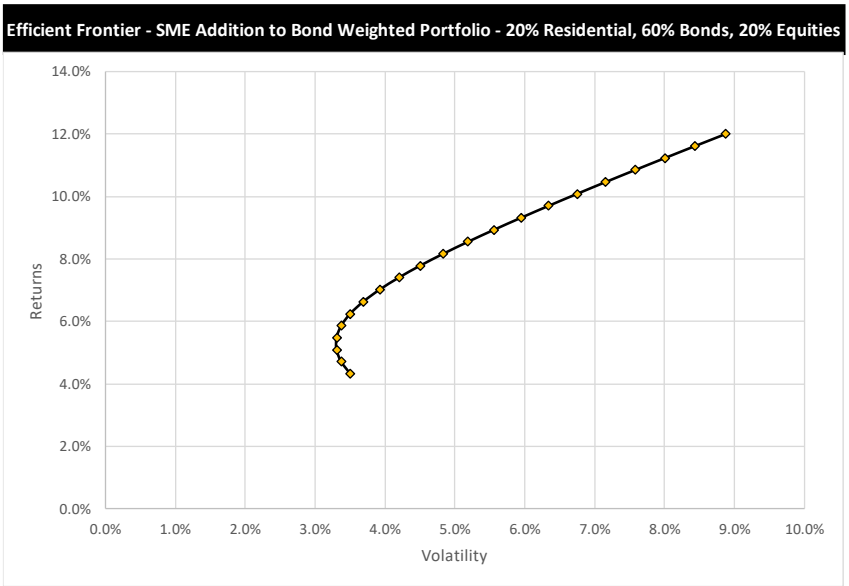


SME PE	Portfolio	Return	Variance	STD DV
0%	100%	2.4%	0.00057	2.4%
5%	95%	2.9%	0.00053	2.3%
10%	90%	3.4%	0.00054	2.3%
15%	85%	3.9%	0.00059	2.4%
20%	80%	4.3%	0.00069	2.6%
25%	75%	4.8%	0.00082	2.9%
30%	70%	5.3%	0.00100	3.2%
35%	65%	5.8%	0.00121	3.5%
40%	60%	6.3%	0.00147	3.8%
45%	55%	6.7%	0.00178	4.2%
50%	50%	7.2%	0.00212	4.6%
55%	45%	7.7%	0.00251	5.0%
60%	40%	8.2%	0.00294	5.4%
65%	35%	8.7%	0.00340	5.8%
70%	30%	9.1%	0.00392	6.3%
75%	25%	9.6%	0.00447	6.7%
80%	20%	10.1%	0.00507	7.1%
85%	15%	10.6%	0.00570	7.6%
90%	10%	11.0%	0.00638	8.0%
95%	5%	11.5%	0.00711	8.4%
100%	0%	12.0%	0.00787	8.9%

6. Efficient Frontiers for Low Risk Portfolio – 20% Real Estate, 60% Bonds, 20% Equities – with allocation of diversified SME portfolio returns: 20 years (2000-2019)[1]

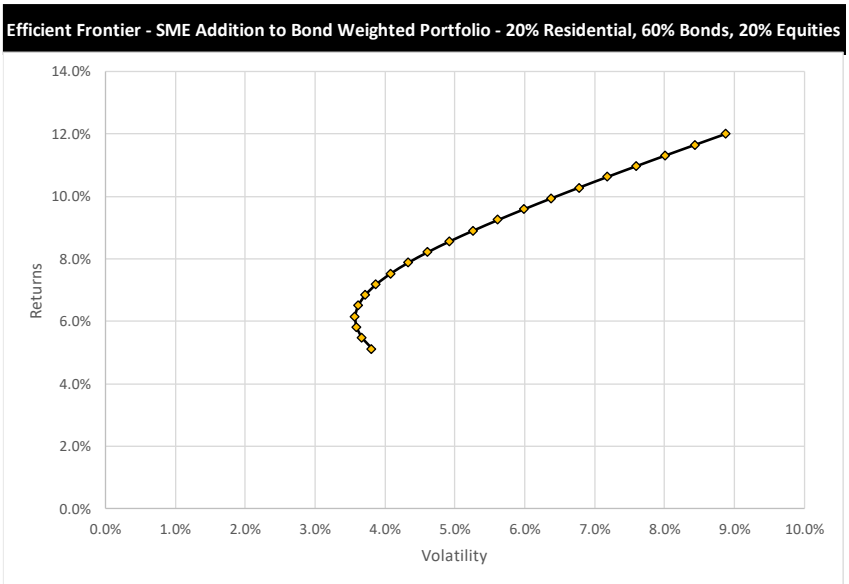
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	3.5%	0.00123	3.5%
5%	95%	3.9%	0.00115	3.4%
10%	90%	4.3%	0.00111	3.3%
15%	85%	4.8%	0.00111	3.3%
20%	80%	5.2%	0.00116	3.4%
25%	75%	5.6%	0.00125	3.5%
30%	70%	6.0%	0.00138	3.7%
35%	65%	6.5%	0.00156	4.0%
40%	60%	6.9%	0.00178	4.2%
45%	55%	7.3%	0.00205	4.5%
50%	50%	7.7%	0.00236	4.9%
55%	45%	8.2%	0.00271	5.2%
60%	40%	8.6%	0.00311	5.6%
65%	35%	9.0%	0.00355	6.0%
70%	30%	9.4%	0.00404	6.4%
75%	25%	9.9%	0.00457	6.8%
80%	20%	10.3%	0.00514	7.2%
85%	15%	10.7%	0.00576	7.6%
90%	10%	11.1%	0.00642	8.0%
95%	5%	11.6%	0.00712	8.4%
100%	0%	12.0%	0.00787	8.9%

7. Efficient Frontiers for Low Risk Portfolio – 20% Real Estate, 60% Bonds, 20% Equities – with allocation of diversified SME portfolio returns: 30 years (1990-2019)[1]



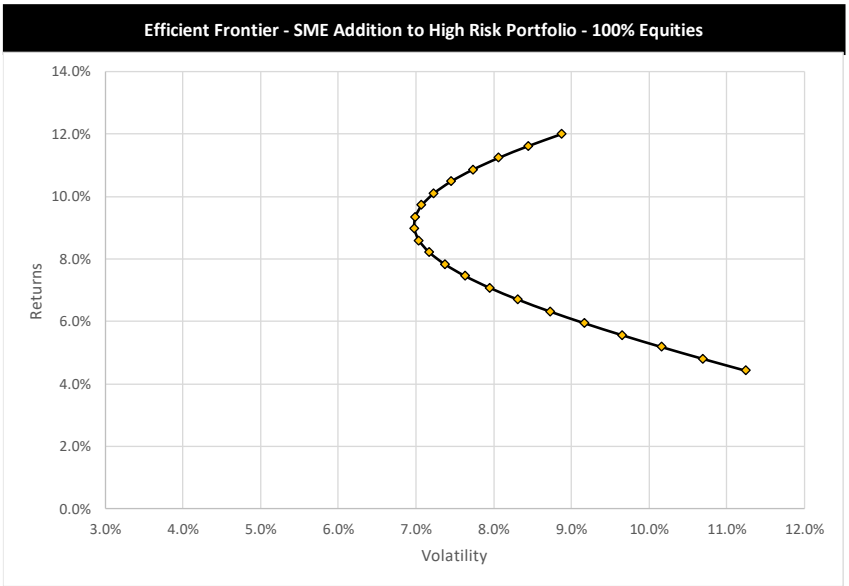
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	4.3%	0.00123	3.5%
5%	95%	4.7%	0.00114	3.4%
10%	90%	5.1%	0.00110	3.3%
15%	85%	5.5%	0.00110	3.3%
20%	80%	5.9%	0.00114	3.4%
25%	75%	6.2%	0.00123	3.5%
30%	70%	6.6%	0.00136	3.7%
35%	65%	7.0%	0.00154	3.9%
40%	60%	7.4%	0.00176	4.2%
45%	55%	7.8%	0.00203	4.5%
50%	50%	8.2%	0.00234	4.8%
55%	45%	8.5%	0.00270	5.2%
60%	40%	8.9%	0.00309	5.6%
65%	35%	9.3%	0.00354	5.9%
70%	30%	9.7%	0.00402	6.3%
75%	25%	10.1%	0.00455	6.7%
80%	20%	10.5%	0.00513	7.2%
85%	15%	10.8%	0.00575	7.6%
90%	10%	11.2%	0.00641	8.0%
95%	5%	11.6%	0.00712	8.4%
100%	0%	12.0%	0.00787	8.9%

8. Efficient Frontiers for Low Risk Portfolio – 20% Real Estate, 60% Bonds, 20% Equities – with allocation of diversified SME portfolio returns: 35 years (1985-2019)[1]



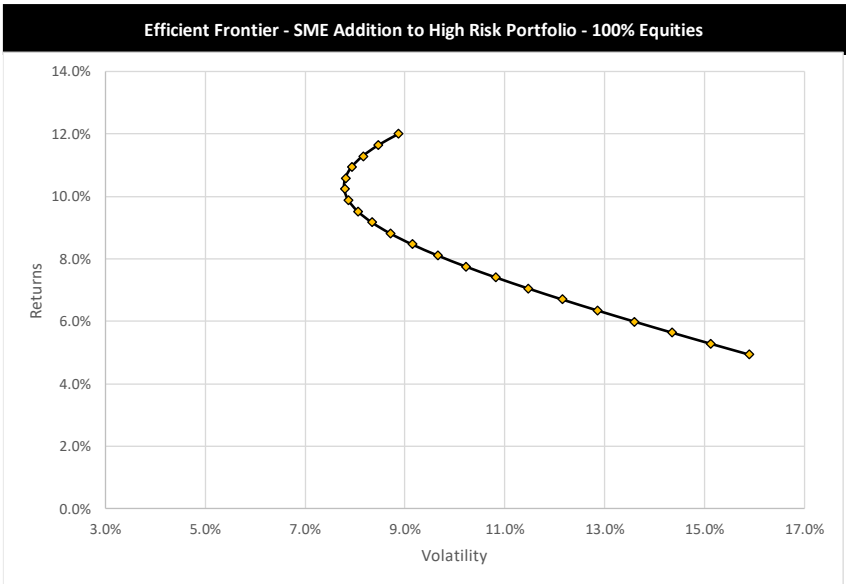
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	5.1%	0.00145	3.8%
5%	95%	5.5%	0.00135	3.7%
10%	90%	5.8%	0.00129	3.6%
15%	85%	6.2%	0.00127	3.6%
20%	80%	6.5%	0.00130	3.6%
25%	75%	6.8%	0.00138	3.7%
30%	70%	7.2%	0.00150	3.9%
35%	65%	7.5%	0.00166	4.1%
40%	60%	7.9%	0.00187	4.3%
45%	55%	8.2%	0.00213	4.6%
50%	50%	8.6%	0.00243	4.9%
55%	45%	8.9%	0.00277	5.3%
60%	40%	9.2%	0.00316	5.6%
65%	35%	9.6%	0.00359	6.0%
70%	30%	9.9%	0.00407	6.4%
75%	25%	10.3%	0.00459	6.8%
80%	20%	10.6%	0.00516	7.2%
85%	15%	11.0%	0.00577	7.6%
90%	10%	11.3%	0.00642	8.0%
95%	5%	11.7%	0.00712	8.4%
100%	0%	12.0%	0.00787	8.9%

9. Efficient Frontiers for High Risk Portfolio – 100% Equities – with allocation of diversified SME portfolio returns: 10 years (2010-2019)[(1)]



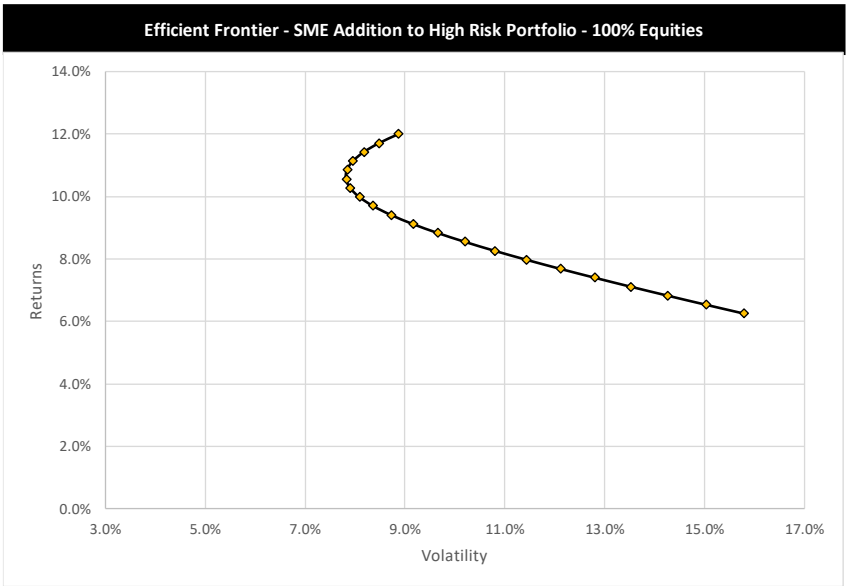
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	4.4%	0.01265	11.2%
5%	95%	4.8%	0.01144	10.7%
10%	90%	5.2%	0.01033	10.2%
15%	85%	5.6%	0.00932	9.7%
20%	80%	5.9%	0.00841	9.2%
25%	75%	6.3%	0.00761	8.7%
30%	70%	6.7%	0.00691	8.3%
35%	65%	7.1%	0.00632	7.9%
40%	60%	7.5%	0.00582	7.6%
45%	55%	7.8%	0.00543	7.4%
50%	50%	8.2%	0.00514	7.2%
55%	45%	8.6%	0.00495	7.0%
60%	40%	9.0%	0.00487	7.0%
65%	35%	9.4%	0.00488	7.0%
70%	30%	9.7%	0.00500	7.1%
75%	25%	10.1%	0.00522	7.2%
80%	20%	10.5%	0.00555	7.4%
85%	15%	10.9%	0.00598	7.7%
90%	10%	11.2%	0.00650	8.1%
95%	5%	11.6%	0.00714	8.4%
100%	0%	12.0%	0.00787	8.9%

10. Efficient Frontiers for High Risk Portfolio – 100% Equities – with allocation of diversified SME portfolio returns: 20 years (2000-2019)[(1)]



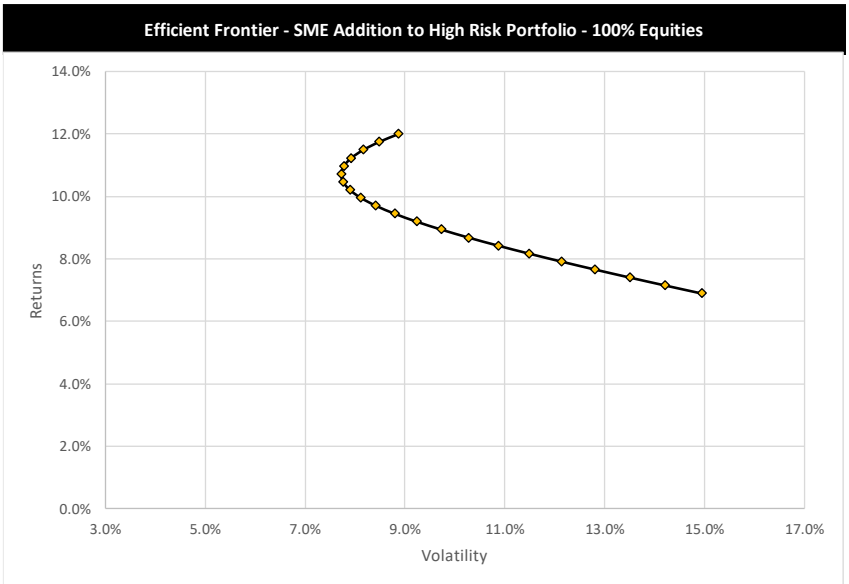
SME PE	Portfolio	Return	Variance	STD DV
0%	100%	4.9%	0.02529	15.9%
5%	95%	5.3%	0.02286	15.1%
10%	90%	5.6%	0.02060	14.4%
15%	85%	6.0%	0.01850	13.6%
20%	80%	6.3%	0.01656	12.9%
25%	75%	6.7%	0.01478	12.2%
30%	70%	7.1%	0.01317	11.5%
35%	65%	7.4%	0.01173	10.8%
40%	60%	7.8%	0.01045	10.2%
45%	55%	8.1%	0.00933	9.7%
50%	50%	8.5%	0.00838	9.2%
55%	45%	8.8%	0.00759	8.7%
60%	40%	9.2%	0.00696	8.3%
65%	35%	9.5%	0.00650	8.1%
70%	30%	9.9%	0.00620	7.9%
75%	25%	10.2%	0.00607	7.8%
80%	20%	10.6%	0.00610	7.8%
85%	15%	10.9%	0.00630	7.9%
90%	10%	11.3%	0.00666	8.2%
95%	5%	11.6%	0.00718	8.5%
100%	0%	12.0%	0.00787	8.9%

11. Efficient Frontiers for High Risk Portfolio – 100% Equities – with allocation of diversified SME portfolio returns: 30 years (1990-2019)(1)



SME PE	Portfolio	Return	Variance	STD DV
0%	100%	6.3%	0.02497	15.8%
5%	95%	6.5%	0.02259	15.0%
10%	90%	6.8%	0.02037	14.3%
15%	85%	7.1%	0.01831	13.5%
20%	80%	7.4%	0.01641	12.8%
25%	75%	7.7%	0.01468	12.1%
30%	70%	8.0%	0.01310	11.4%
35%	65%	8.3%	0.01168	10.8%
40%	60%	8.6%	0.01042	10.2%
45%	55%	8.8%	0.00933	9.7%
50%	50%	9.1%	0.00839	9.2%
55%	45%	9.4%	0.00762	8.7%
60%	40%	9.7%	0.00700	8.4%
65%	35%	10.0%	0.00655	8.1%
70%	30%	10.3%	0.00626	7.9%
75%	25%	10.6%	0.00612	7.8%
80%	20%	10.9%	0.00615	7.8%
85%	15%	11.1%	0.00634	8.0%
90%	10%	11.4%	0.00669	8.2%
95%	5%	11.7%	0.00720	8.5%
100%	0%	12.0%	0.00787	8.9%

12. Efficient Frontiers for High Risk Portfolio – 100% Equities – with allocation of diversified SME portfolio returns: 35 years (1985-2019)(1)



SME PE	Portfolio	Return	Variance	STD DV
0%	100%	6.9%	0.02234	14.9%
5%	95%	7.2%	0.02022	14.2%
10%	90%	7.4%	0.01824	13.5%
15%	85%	7.7%	0.01642	12.8%
20%	80%	7.9%	0.01473	12.1%
25%	75%	8.2%	0.01320	11.5%
30%	70%	8.4%	0.01182	10.9%
35%	65%	8.7%	0.01058	10.3%
40%	60%	8.9%	0.00949	9.7%
45%	55%	9.2%	0.00854	9.2%
50%	50%	9.5%	0.00774	8.8%
55%	45%	9.7%	0.00709	8.4%
60%	40%	10.0%	0.00659	8.1%
65%	35%	10.2%	0.00624	7.9%
70%	30%	10.5%	0.00603	7.8%
75%	25%	10.7%	0.00597	7.7%
80%	20%	11.0%	0.00605	7.8%
85%	15%	11.2%	0.00629	7.9%
90%	10%	11.5%	0.00667	8.2%
95%	5%	11.7%	0.00719	8.5%
100%	0%	12.0%	0.00787	8.9%

FOOTNOTES:

(1) SME return profile generated from Equicapita's SME Buyout Fund based on historical results and management estimates.

CONCLUSIONS: Based on the efficient frontier analysis, Canadian SMEs represent a good investment for enhancing returns while lowering volatility. For a medium risk portfolio represented by 20% real estate, 40% bonds and 40% equity holdings, SME investment exposure could enhance financial performance and a material allocation to SMEs, ranging between 15%-40% of an overall portfolio, is supportable.

NOTES:

The data used to derive the data series in this paper come from multiple sources listed below:

SME return profile	The SME return profile was developed incorporating the following: - Equicapita's mean return of ~12% per annum based on historical results form 2013-2019, held constant; and - Equicapita's 6-year historical pro forma revenue used to calculate variance and standard deviation of 0.0079 and 0.0887, respectively.
CPI	StatsCan
Oil	https://www.macrotrends.net/1369/curde-oil-price-history-chart
Natgas	Henry Hub Natural Gas Spot Price (Dollars per Million Btu)
Gold	http://onlygold.com/Info/Historical-Gold-Prices.asp
GDP	Worldbank
Residential properties	StatsCan – New Housing Price Index
Bond	Bank of Canada – Historical 10 Year Bond Yield
TSX Index	S&P/TSX Composite index (^GSPTSE) - Yahoo Finance (monthly)

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2. Rudin, Alexander, Mao, Jason, Zhang, Nan R., and Finke, Anne-Marie (2019). “Fitting Private Equity into the Total Portfolio Framework”. In the Journal of Portfolio Management, November 2019

DISCLAIMER

Our reports, including this paper, express our opinions which have been based, in part, upon generally available public information and research as well as upon inferences and deductions made through our due diligence, research and analytical process.

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EQUICAPITA

DATA TABLE (1985-2019):

Year	CPI	WTI Oil	NatGas	Gold	GDP	Residential Properties	Bond	TSX Index
1985	4.0%	3.4%	-5.6%	6.2%	4.7%	3.7%	10.2%	20.8%
1986	4.1%	-32.8%	-22.7%	19.5%	2.1%	12.0%	8.4%	5.7%
1987	4.4%	-6.6%	-13.9%	24.5%	4.1%	11.6%	9.2%	3.1%
1988	3.9%	2.3%	1.2%	-15.7%	4.4%	13.6%	10.0%	7.3%
1989	5.1%	27.6%	0.0%	-2.2%	2.3%	9.5%	10.0%	17.1%
1990	4.8%	30.4%	1.2%	-3.7%	0.2%	-5.4%	10.4%	-18.0%
1991	5.6%	-32.8%	-4.1%	-8.6%	-2.1%	-3.3%	8.3%	7.8%
1992	1.4%	1.8%	6.1%	-5.7%	0.9%	0.7%	8.0%	-4.6%
1993	1.9%	-27.2%	17.2%	17.6%	2.7%	1.1%	6.4%	29.0%
1994	0.1%	25.2%	-9.3%	-2.2%	4.5%	-0.2%	9.2%	-2.5%
1995	2.2%	10.0%	-16.2%	1.0%	2.7%	-1.9%	7.0%	11.9%
1996	1.5%	32.6%	40.0%	-4.7%	1.6%	-0.9%	6.5%	25.7%
1997	1.7%	-31.9%	14.7%	-22.2%	4.3%	1.3%	5.4%	13.0%
1998	1.0%	-31.2%	-16.1%	0.6%	2.8%	0.7%	4.9%	-3.2%
1999	1.8%	112.2%	8.6%	0.5%	4.0%	1.6%	6.5%	29.7%
2000	2.7%	3.7%	89.9%	-6.1%	4.9%	2.4%	5.4%	6.2%
2001	2.5%	-25.3%	-8.1%	1.4%	1.4%	2.7%	5.4%	-13.9%
2002	2.2%	56.4%	-14.6%	24.0%	3.4%	5.1%	5.0%	-14.0%
2003	2.8%	4.2%	61.8%	21.7%	3.8%	5.1%	4.5%	24.3%
2004	1.8%	33.4%	7.7%	4.4%	3.9%	5.1%	4.2%	12.5%
2005	2.2%	40.8%	47.5%	17.8%	5.0%	6.0%	4.2%	21.9%
2006	2.0%	-0.3%	-22.6%	23.9%	4.2%	10.7%	4.2%	14.5%
2007	2.2%	57.7%	3.6%	31.6%	6.9%	6.2%	3.9%	7.2%
2008	2.3%	-53.5%	27.1%	4.0%	1.0%	0.5%	3.1%	-35.0%
2009	0.3%	78.0%	-55.5%	25.0%	-2.9%	-0.9%	3.4%	30.7%
2010	1.8%	15.1%	10.9%	30.6%	3.1%	2.0%	3.3%	14.4%
2011	2.9%	8.2%	-8.5%	7.8%	3.1%	2.6%	1.9%	-11.1%
2012	1.5%	-7.1%	-31.3%	8.7%	1.8%	2.2%	2.0%	4.0%
2013	0.9%	6.9%	35.6%	-27.6%	2.3%	1.3%	2.3%	9.6%
2014	2.0%	-45.6%	17.2%	-0.4%	2.9%	1.7%	1.7%	7.4%
2015	1.1%	-30.5%	-40.0%	-11.6%	0.7%	1.6%	1.4%	-11.1%
2016	1.4%	44.8%	-3.8%	8.1%	1.0%	3.1%	1.7%	17.5%
2017	1.6%	12.5%	18.7%	10.3%	3.2%	3.3%	2.0%	6.0%
2018	2.3%	-25.3%	5.4%	-3.0%	2.0%	0.0%	1.9%	-11.6%
2019	1.9%	35.4%	-18.7%	16.2%	1.7%	0.1%	1.5%	19.1%
Mean	2.3%	8.3%	3.5%	5.5%	2.6%	3.0%	5.2%	6.9%
Variance	0.0%	12.8%	7.7%	2.1%	0.0%	0.2%	0.1%	2.2%
Stand Dev	1.3%	35.8%	27.8%	14.4%	1.9%	4.2%	2.9%	14.9%
Covariance	- 0.00001	0.00084	0.00210	0.00045	0.00037	0.00042	0.00005	0.00038
Correlation	- 0.02594	0.12164	0.39281	0.16162	1.00000	0.50874	0.08903	0.13349
2013-2019 mean return	1.6%	-0.3%	2.0%	-1.1%	2.0%	1.6%	1.8%	5.3%
10 yr Stand Dev	0.6%	27.3%	22.5%	15.0%	0.9%	1.1%	0.5%	11.2%
20 yr Stand Dev	0.6%	34.8%	34.0%	14.7%	2.0%	2.6%	1.3%	15.9%
30 yr Stand Dev	1.1%	37.6%	29.4%	14.3%	2.0%	3.0%	2.4%	15.8%
35 yr Stand Dev	1.3%	35.8%	27.8%	14.4%	1.9%	4.2%	2.9%	14.9%
10 yr Sharpe Ratio	1.34	0.02	- 0.11	0.19	1.36	0.74	1.98	0.31
20 yr Sharpe Ratio	1.44	0.27	0.15	0.57	0.84	0.77	1.62	0.25
30 yr Sharpe Ratio	0.95	0.24	0.15	0.30	0.75	0.27	1.46	0.33
35 yr Sharpe Ratio	1.05	0.21	0.09	0.31	0.85	0.47	1.49	0.39