THE TRUE COSTS OF Income rusts

New research on the trade costs and market behaviour of TSX-listed trusts

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two-phase inclusion of income trusts in the S&P/TSX Composite Index has introduced marked changes in the Canadian equity index landscape in 2005 and 2006. To allow portfolio managers to adapt to the change, the index adjustment for each income trust addition is based on half the market float in December 2005 and the full float in March 2006. The primary reason cited for this change to the Composite Index is that it was becoming progressively less representative of Canadian equity investment opportunities.

Income trusts have a market capitalization of nearly \$130 billion (Buchanan, 2005), up from \$44.8 billion in 2002, and represent approximately 8% (up from 6% in 2002) of total TSX market capitalization (Ebden, 2005). Halpern (2004) outlines a number of key reasons that contribute to the growth of business trusts, including a low interest rate environment which makes relatively high trust distributions more attractive; investor demand for securities that provide stable cash flows at acceptable risk levels; the reduced probability that agents of the firm will invest in unprofitable opportunities due to reduced cash flows caused by large payouts; and tax efficiency.

Considering the importance of adding this asset class to the Composite Index, one would expect that a substantial body of peer-reviewed published research exists. Notwithstanding the steady flow of proprietary research conducted by the major Canadian brokerages and strong coverage in the business media, only a handful (albeit a growing number) of such articles exist. For example, King (2004) highlights the recent growth of income trusts and the steps that investors should consider prior to income trust investment. However, it does not address either the trade costs nor the liquidity or return volatilities associated with this asset class.

While trade costs are examined for TSX-listed common stocks in Cleary et al (2002) and for Canadian common stock IPOs and dividend-paying cross-listings in Kryzanowski et al (2006) and Kryzanowski and Lazrak (2005), no similar detailed analysis exists for TSX-listed income trusts. Due to the relatively low proportional ownership of income trusts by institutional investors, secondary market liquidity and trade costs of income trusts is an ongoing concern (Steiner, 2003; King, 2004), especially since rules limit the number of non-resident shareholders for some trusts and few of them are cross-listed on U.S. markets. Liquidity issues are supposedly acute for the exit strategies of institutional buyers with significant allocations of IPO trusts (Stewart and DeCloet, 2005). This liquidity concern is

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reflected in S&P's two-phase addition of the trusts to the S&P/TSX Composite Index. However, whether such concerns are supported empirically remains to be determined. Therefore, the primary goal of this study is to provide the growing number of investors (especially indexers and institutional) with some insight into what magnitude of liquidity, trade costs, returns and risks to expect with income trust investing.

Methodology

An initial list of business, resource and utility trusts is obtained from Investment.com. Real estate and closedend investment trusts are excluded due to their different characteristics. To obtain the microstructure samples, this initial list is cross-matched to the *TSX Monthly Review* for the first six months of both 2003 and 2004 to determine if the income trust traded in those months, and to pick up any missing trusts. The number of trusts increased substantially from 45 to 63 (a 40% increase for business trusts), from 25 to 36 (a 44% increase for resource trusts) and from 18 to 22 (a 22% increase for utility trusts) from 2003 to 2004.

Intraday trade and quote data for the trusts and two types of benchmarks are extracted from the TSX's equity history database. The first benchmark type consists of two prominent exchange-traded funds (ETFs): the i60 Fund (ticker symbol XIU) that tracks the S&P/TSX 60 Index, and the TD S&P/TSX Composite Index Fund (ticker symbol TTF). Compared to the i60, the latter ETF gives investors exposure to a wider range of stocks and is not traded as extensively. The second benchmark type consists of 15 stocks from the S&P/TSX Composite Index. These are stocks 1 to 5, 100 to 104 and 200 to 204 according to the ranking from highest to lowest float caps in the December 2003 issue of the TSX Monthly Review.

Daily closing prices, bids, asks, volumes, distributions and returns for each trust in each trust category for the 2004 sample are also extracted from the Canadian Financial Markets Research Centre (CFMRC) database for the period from 2002 to 2004. Trust distributions

are used to adjust midspread quotes to calculate daily returns for each no-trade and subsequent day since CFMRC reports no returns for these days.² In order to gauge the impact of new entrances and exits of trusts, they are included in the yearly samples only if they are available for trade for the full year and in the full three-year sample and the equal-weighted trust portfolio whenever they are available for trade.

The cross-sectional mean and median of the first two return moments and Sharpe (excess return-to-variability) ratios are compared against three benchmarks: the S&P/TSX Composite Index, and the long-term corporate and government bond indexes from Scotia Capital (SC). The relative stock and bond sensitivities or betas of the trusts and equal-weighted portfolios are measured using various time frames, single and two-factor market models, and raw and excess returns. While at least 29 (142) observations are available for the beta calculations when weekly (daily) data are used, betas could not be calculated for a number of the trusts if monthly returns were used instead, due to an insufficient number of observations.

Trade Activity, Costs and Liquidity

Liquidity is manifested in the relative level of depth, spread and trade-related statistics. Market depth measures the size of an average market order that is executable at the best bid and offer or BBO (i.e., without working up or down the book). From Table 1, median and mean averaged quoted depths at the BBO are similar for business (\$22,959 and \$25,821) and utility trusts (\$26,746 and \$29,644), which are lower than those for resource trusts (\$34,539 and \$36,644). They are substantially lower than for the two ETFs (\$518,890 for XIU and \$262,643 for TTF) and are between the Composite 100-104 (\$36,972 and \$43,641) and 200-204 sub-samples (\$13,287 and \$18,337).³

Quoted spread measures provide investors with the best estimate of the likely trade cost associated with a market order that does not exceed the quoted depth at the BBO. Among the trusts, mean quoted spreads and proportional quoted spreads (which adjust for price levels) are lowest for resource trusts at 9.32 cents and 59 basis points (bps) respectively, which lie between those for the XIU ETF (3.18 cents and 7 bps respectively) and TTF ETF (24.46 cents and 86 bps respectively). They are lower than the 10.94 cents but higher than the 45 bps for the Composite 100-104. Business trust and resource trust investors submitting market orders can incur round-trip trading costs as high as the maximum proportional quoted spreads of 283 bps and 267 bps for these two trust classes respectively.

The effective spread measures provide investors with the best estimate of the trade cost actually incurred, given the mix of limit and market orders submitted and executed. Proportional effective spreads account for trades that occur at, within, and outside the BBO. Business trusts have the highest mean (proportional) effective spread of 9.53 cents (83 bps), which are higher than the corresponding means for the three composite samples. The maximum effective spread measures (49.12 cents and 288 bps) exceed their quoted counterparts (43.53 cents and 267 bps) in the

resource panel because the quoted spreads for Enterra Energy Trust were sufficiently higher during trading than non-trading periods.

Resource trusts have the largest mean number of trades and dollar volume daily (184 and \$2.92 million), which pales in comparison to the XIU ETF (601 trades and \$72.85 million) and outshines the TTF ETF (9 trades and \$210,000). Thus, the TTF ETF appeals to investors who desire a more diversified portfolio and have longer average holding periods over which to amortize the higher spreads. The mean daily number of trades exceeds that of the Composite 100-104 (162 trades) and the mean daily dollar volume lies between that of the Composite 100-104 (\$5.06 million) and Composite 200-204 (\$1.13 million).

The added dimension of capitalization or cap is now explored. Since no standard delineation of cap breakpoints exists in practice and cap categories need to include more than one trust, small caps are under \$250 million, mid caps are \$250 million to \$1 billion and

Table 1: Cross-sectional Depth, Spread and Trading Statistics for TSX-Listed Income Trusts, ETFsand 15 S&P/TSX Composite Stocks, First 6 months, 2004

			Quoted		Eff	ective			
Sample	Stat	Depth Spread (\$000) (cents)		Proportional Spread (bps)	Spread (cents)	Proportional Spread (bps)	Number of Trades	Dollar Volume (\$000,000)	
Business trusts (N=63)	Min Median Mean Max	9.38 22.96 25.82 107.07	2.20 10.08 11.60 38.64	19 86 100 283	1.95 8.34 9.53 27.04	17 73 83 238	5 34 54 486	0.03 0.46 0.97 15.23	
Resource trusts (N=36)	Min Median Mean Max	14.50 34.54 36.64 72.66	2.06 6.82 9.32 43.53	21 40 59 267	1.73 5.45 8.01 49.12	17 32 51 288	12 168 184 523	0.10 2.28 2.92 15.02	
Utility trusts (N=22)	Min Median Mean Max	14.09 26.75 29.64 63.39	3.39 7.18 8.51 20.47	32 60 70 170	2.98 6.12 6.99 15.66	28 51 58 129	11 92 103 263	0.20 1.09 1.34 3.18	
ETF	XIU TTF	518.89 262.64	3.18 24.46	7 86	2.69 22.15	6 77	601 9	72.85 0.21	
Composite, 1-5	Median Mean	124.39 133.14	4.31 4.15	9 9	3.63 3.41	7 7	1962 2004	66.26 69.74	
Composite, 100-104	Median Mean	36.97 43.64	9.65 10.94	46 45	7.69 9.26	40 38	148 162	3.40 5.06	
Composite, 200-204	Median Mean	13.29 18.34	10.12 11.27	97 90	6.25 8.61	64 70	80 75	0.77 1.13	

Quoted Depths (and spreads) for each income trust are time-series averages of daily averages. Daily cumulation is used for number of trades and dollar volume. Quoted Depth = $E(bid^*bid size + ask*size)/21$. $E(bid^*bid size + ask*size)/21$.

large caps are above \$1 billion herein.

Although our previous analysis undifferentiated by cap size pointed to resource trusts as having the largest quoted depth, the two large cap business trusts actually have the largest mean quoted depth of \$74,538 (see Table 2). Mean quoted depth for mid caps is about 13% larger for resource trusts (\$33,952) compared with business (\$30,039) and utility (\$29,966) trusts. Small cap business trusts have the lowest mean quoted depth (\$21,593) but median quoted depths are very similar (\$21,552 for business trusts, \$21,841 for resource trusts and \$21,375 for utility trusts).

According to median and mean proportional effective spreads and proportional quoted spreads, trading costs increase progressively from large through small cap trusts. Given that small business trusts are by far the most numerous (42), the typical investor using market orders will likely pay round-trip trading costs in excess of 1% based on this category's median proportional quoted spread of 105 bps. Consistent with reported trading costs, median and mean numbers of trades and dollar volume are highest for large cap trusts of each type and decline progressively for mid and small cap trusts within each category.

Returns, volatilities and factor sensitivities

An inspection of Panel A in Table 3 suggests that crosssectional annualized weekly mean (median) returns are high at 29.19% (25.83%) for the total sample, as are their corresponding standard deviations at 22.35% (18.66%), which suggests that low or negative returns are a distinct possibility for many trusts.6 Nevertheless, the Sharpe or excess return-to-variability ratio is high (1.31).7 Scholes-Williams-adjusted mean (median) betas based on raw returns are low at 0.28 (0.22) and range from -1.34 to 2.73. Their excess return counterparts (0.39 and 0.35 respectively) are higher, as is the case for the three trust categories examined below. Significantly higher annualized mean (median) returns of 35.66% (31.69%) coupled with lower mean (median) standard deviations of 19.46% (16.67%) led to an even higher mean (median) Sharpe ratio of 1.87 (1.96) in 2003.

With a few exceptions, performance measures based on annualized daily returns are qualitatively similar. Mean (median) returns are close to their weekly counterparts at 29.54% (26.96%). Standard deviations are slightly higher due to a greater impact of bid-ask bounce and of multi-day returns over weekends and holidays. In turn,

Table 2: TSX-Listed Income Trust Depth, Spread and Trading Statistics by Trust Type and Capitalization, Jan-June 2004

	Quoted							Effective													
	Depth Spread (\$000) (cents)			Proportional Spread (bps)			Spread (cents)		Proportional Spread (bps)		Number of Trades		Dollar Volume (\$000,000)								
Trust/Cap Categories																					
Stat	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L
Utility Tr	Utility Trusts (N=6S, 10M & 6L)																				
Min	9.38	17.72	42.00	4.72	2.75	2.20	47	33	19	4.07	2.35	1.95	40	28	17	5	5	261	0.03	0.14	3.98
Median	21.55	28.34	74.54	11.48	9.16	4.60	105	67	23	9.28	7.66	3.88	84	54	19	28	65	373	0.31	0.91	9.61
Mean	21.59	30.04	74.54	12.28	10.83	4.60	116	73	23	10.20	8.62	3.88	96	59	19	31	71	373	0.41	1.29	9.61
Max	34.00	59.89	107.07	29.83	38.64	6.99	283	182	27	26.41	27.04	5.81	238	127	22	98	195	486	2.20	5.67	15.23
Resource	Trusts	(N=8S	, 19M	& 9L)																	
Min	14.50	17.19	36.90	3.94	2.06	4.19	38	21	24	3.20	1.73	3.57	31	17	20	12	14	165	0.10	0.13	3.18
Median	21.84	34.31	48.04	7.12	5.23	6.87	81	39	30	5.82	4.38	5.63	67	33	26	45	170	301	0.65	2.05	5.26
Mean	24.33	33.95	53.28	10.04	8.98	9.38	90	58	33	8.22	8.21	7.42	74	52	26	59	167	333	0.74	2.17	6.42
Max	34.58	49.24	72.66	31.05	43.53	21.59	167	267	42	24.62	49.12	16.34	141	288	32	165	398	523	1.55	4.93	15.02
Business	Business Trusts (N=42S, 19M & 2L)																				
Min	14.09	19.63	18.36	4.85	3.39	3.75	49	36	32	4.16	2.98	3.32	42	32	28	11	41	100	0.20	0.65	0.82
Median	21.37	26.75	33.09	9.21	7.05	6.83	111	60	44	7.44	5.92	5.89	88	51	38	43	93	137	0.43	1.21	2.55
Mean	23.31	29.97	35.44	11.11	7.33	7.87	109	61	47	8.77	6.12	6.66	87	51	40	42	102	165	0.55	1.18	2.40
Max	37.47	57.96	63.39	20.47	13.61	13.71	170	104	67	15.66	11.22	11.60	129	86	55	75	170	263	1.08	1.61	3.18

S(mall), M(id) and L(arge) refer to capitalized trust values of less than 250 million, 250 million to 1 billion and greater than 1 billion dollars respectively. The averaging procedure and a description of the variables are given in Table 1. Bps refers to basis points. N refers to sample size.

this produces marginally lower mean and median Sharpe ratios of 1.26 and 1.28 for the full sample.

From Panel B and as expected, the equal-weighted trust portfolio has a similar annualized mean weekly return (29.97% versus 29.19%) and same stock beta (0.28) as the average trust with a substantially lower annualized mean standard deviation (8.02% versus 22.35%). This follows from holding a "diversified" portfolio of trusts instead of an "average" trust. As a result, the equal-weighted portfolio has a much higher Sharpe ratio (3.44 versus 1.31).

Annualized mean weekly returns for three benchmarks are, respectively, 8.97% (S&P/TSX Composite Index), 10.97% (SC Long Corporate) and 9.55% (SC Long Government). Although their respective Sharpe ratios of 0.49, 1.30 and 1.08 pale in comparison to the 3.44 for

the equal-weighted trust portfolio, the Sharpe ratios of the two bond benchmarks are comparable to the 1.31 for the average trust. The low stock betas of 0.07 and -0.02 for the latter two bond indexes suggest that valuable diversification benefits are obtainable from investment in bond portfolios that proxy for these currently non-traded indexes. A comparison of the stock beta for the equal-weighted portfolio of 0.28 against those for these three benchmarks suggests that income trusts are equities that have more bond- than stock-like stock market risk sensitivities. This is further confirmed for the full sample (and for each trust category) given the mean (median) stock and bond risk sensitivities of 0.29 (0.23) and 0.43 (0.40) reported in Panel A for the two-factor market model.8

Based on Panels C, D and E of Table 3, mean (median) annualized weekly returns for resource

 Table 3: Performance Results for the Income Trusts, 2002-2004

			Beta							
	Re	eturns (%)	Standard De	eviation (%)		Excess Ret.	Raw Ret.	Tw	Two-factor	
Statistic V	Neekly	Annualized	Weekly	Annualized	Sharpe	Stock	Stock	Stock	LG Bond	
Panel A: Cross-section	nal meas	sures of perfor								
Min	-0.78	-40.39	1.25	9.03	-0.96	-0.33	-1.34	-1.37	-0.88	
Median	0.50	25.83	2.59	18.66	1.37	0.35	0.22	0.23	0.40	
Mean	0.56	29.19	3.10	22.35	1.31	0.39	0.28	0.29	0.43	
Max	1.80	93.71	8.87	63.98	3.44	1.82	2.73	2.53	2.30	
Panel B: Measures of	perform	nance for equa								
Equal-weighted Port.	0.58	29.97	1.11	8.02	3.44	0.41	0.28	0.30	0.29	
S&P/TSX Comp.	0.17	8.97	1.85	13.31	0.49	1.00	1.00	1.01	0.10	
SC Long Corp Bond	0.21	10.97	0.91	6.55	1.30	0.08	0.07	0.16	1.00	
SC Long Govt Bond	0.18	9.55	0.91	6.57	1.08		-0.02	0.06	1.01	
Panel C: Cross-section	nal mea	asures of perf								
Min	-0.78	-40.39	1.53	11.00	-0.96	-0.33	-0.85	-0.94	-0.88	
Median	0.48	24.80	2.58	18.63	1.34	0.34	0.20	0.20	0.41	
Mean	0.51	26.49	3.25	23.42	1.23	0.34	0.23	0.23	0.49	
Max	1.80	93.71	8.87	63.98	3.44	1.47	1.29	1.29	2.10	
Panel D: Cross-section	onal me	asures of per	formance for 3	36 resource t	rusts					
Min	-0.05	-2.66	1.94	13.97	-0.19	0.09	-1.34	-1.37	-0.80	
Median	0.64	33.39	2.91	21.01	1.52	0.45	0.27	0.30	0.25	
Mean	0.77	39.82	3.37	24.31	1.54	0.53	0.43	0.43	0.26	
Max	1.76	91.58	5.57	40.15	2.78	1.82	2.73	2.53	2.30	
Panel E: Cross-section	onal me	asures of per								
Min	-0.02	-1.01	1.25	9.03	-0.15	-0.07	-0.29	-0.24	0.01	
Median	0.32	16.88	2.04	14.68	1.03	0.25	0.12	0.18	0.57	
Mean	0.37	19.49	2.23	16.11	1.14	0.29	0.20	0.24	0.55	
Max	1.10	57.28	4.92	35.47	2.63	0.86	0.96	0.98	1.13	

Various performance statistics are reported for the 2004 sample of TSX-listed Business, Resource and Utility trusts. Sharpe ratios measure excess annualized weekly returns per unit of total risk using adjusted 1-month T-bill rates as the risk-free proxy (series V39063 from www.bankofcanada.ca). All beta estimates are calculated using a Scholes-Williams adjustment for nonsynchronous trading. Market model stock betas are based on excess (i.e., net of long Canada bond) and raw returns. Stock and bond market factors in the two-factor model are proxied by raw returns on the S&P/TSX Composite Index and the Scotia Capital (SC) Long Government (LG) Bond Index. The annualizations are based on 52 weekly and 252 daily return intervals.

trusts at 39.82% (33.39%) exceed those for business trusts and utility trusts at 26.49% (24.80%) and 19.49% (16.88%) respectively. Although their standard deviations are higher, resource trusts still outperform business and utility trusts based on mean (median) Sharpe ratios of 1.54 (1.52) compared to 1.23 (1.34) and 1.14 (1.03). As expected and like their medians, the mean betas are lowest for utilities (0.20) and business trusts (0.20), and highest for resource trusts (0.43).

Conclusions

Five important observations follow from this research. First, liquidity issues must be considered carefully, especially for small trusts (caps below \$250 million) that trade far less often with substantially lower depths. Second, round-trip trading costs suggest that more patient investors can expect to absorb spreads of 51 to 83 bps for an average trust, depending upon trust type, and higher costs of 59 to 100 bps for an average trust if they use market versus limit orders, and over 200 bps for some trusts. These costs are an important performance drag when moving from gross to net returns for income trust investment. Third, mean annualized trust returns in the most recent three-year period exceeded 29% and were highest for resource trusts, which in turn outperformed both business and utility trusts based on the Sharpe ratios. Fourth, over a period that was better for fixed incomelike investments (both bonds and equities), the income trusts substantially outperformed other equities on a risk-adjusted (Sharpe) basis. Fifth, mean stock betas are relatively low for most trusts but can vary widely, especially for resource trusts. Nevertheless, income trusts as equities exhibit more bond- than stock-like stock market risk sensitivities.

These findings suggest that the addition of trusts to the S&P/TSX Composite Index should materially expand the investment opportunity set available for investment, particularly for equity indexers. In turn, this should diversify the benchmark index significantly and materially enhance the return-to-variability performance of the reconstituted index. This also should improve the absolute performance of passively managed (indexed) money but make it more difficult to exhibit superior relative performance for actively managed money given the improvement in the mean-variance efficiency of the reconstituted benchmark market index.

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Endnotes

- 1. Both funds are passively managed and carry very low management expense ratios or MERs (capped at 17 and 25 basis points for XIU and TTF respectively). In a letter to unitholders dated December 22, 2005, the trustee advised unitholders that the TTF fund would be terminated effective on or about March 13, 2006 "based on a lack of investor interest... and low trading volume since..." its creation. Our results reported in Table 1 support this termination rationale. Although TTF has a lower volume and higher trading costs than the XIU and an average trust, the depth of TTF is lower than XIU but higher than any single trust in our sample.
- 2. The efficacy of this approach depends upon the availability of non-stale quotes for no-trade days. After eliminating problematic records, which represent a small percentage of the original sample, the sample consists of 2,286,478 trust trades, 3,436,408 trust quotes, 123,009 ETF trades, 386,755 ETF quotes, and 1,435,264 trades and 2,953,598 quotes for the 15 composite stocks.
- The 2003 results are discussed only when they are substantially different from those for 2004.
- 4. The latter spread is considerably lower than the mean effective spread of 114 bps (median of 62 bps) that Kryzanowski and Lazrak (2005) report for the TSX for the periods around the quarterly earnings announcement dates for 172 Canadian firms cross-listed on the TSX and U.S. exchanges for the calendar year 2002. While the mean and median effective spreads are lower for the trusts on the TSX, their mean and median dollar depths are also lower on the TSX (\$29,736 and \$26,670 for the trusts and \$44,869 and \$35,244 for the cross-listings respectively).
- The corresponding values for the comparable period in 2003 are 380 trades and \$47.39 million for XIU ETF and 4 trades and about \$147,000 for the TTF ETF.
- 6. To save space, (annualized) daily and year-by-year findings are referred to only when necessary.
- Annual T-bill rates are first converted to daily rates and then compounded to match the return frequency and trading day spacing used herein.
- 8. The beta estimates from the two-factor model using long corporate bond returns are unreported because they are not materially different.

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