REIT Cash Flows and Stock Returns

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I examine the association between cash flow measures based on financial statements information and stock market returns of REITs. The topic is relevant for decision makers in formulating investment actions. I use cash flow measures identified by Foerster, Tsagarelis, and Wang (2017) as having significant predictive power in explaining future returns. I also use REIT specific cash flow measure, funds from operations (FFO). I do not confirm the findings of Foerster, Tsagarelis, and Wang (2017) for REITs. Results based on REIT FFO are identical to the other cash flow measures. These findings suggest that further research is necessary to establish if market environment or research design or both may be responsible for results.

Keywords: REITs, cash flows, returns, funds from operations

INTRODUCTION

Financial statements information is critical for investment decisions. Investors and analysts rely on that information before formulating investment actions. Therefore, it should be no surprise to identify a link between financial statements information and stock returns. However, that link is not well established for most accounting data except for book-to-market ratio as documented by Fama and French (1992). More recently, Fama and French (2015) identify profitability and investment measures as common sources of risk that diminish the relevancy of book-to-market ratio.

In this paper, I examine if cash flow measures identified by Foerster, Tsagarelis, and Wang (2017) can predict stock market returns of REITs. The REIT focus of the study is about extending the literature where many similar studies specifically exclude REITs. For example, Foerster, Tsagarelis, and Wang (2017) do not include REITs in their sample selection process that is quite common. Many researchers consider REITs to be financial stocks even though REITs are part of a separate real estate sector in major indices. Cash flow measures are based on financial statements of firms and are adjusted for specific items. A link between cash flow measures and REIT stock market returns would provide important information to investors in terms which accounting data to focus on and identifying potential investment candidates. Beyond applying cash flow measures of Foerster, Tsagarelis, and Wang (2017) to REITs, I also evaluate the information content of a REIT specific cash flow measure, funds from operations or FFO. The FFO is based on adjustment to net income for non-cash items, extraordinary transaction and accruals.

I do not find a link between cash flow measures of Foerster, Tsagarelis, and Wang (2017) and future stock returns. I also observe that results for REIT FFO are the same.

This paper is organized as follows. The next section provides findings reported in the literature. Section 3 provides information on the sample used in the study and methodologies applied. Section 4 presents the findings and Section 5 concludes the paper.

LITERATURE REVIEW

The predictive power of financial statement information is important for investment decisions. Relevant literature on the topic indicates that there financial statements data points that may have significant power in explaining stock market returns. For example, Fama and French (1992) show that there is an association between book-to-market ratio and stock returns. Novy-Marx (2013) documents that gross profits to total assets ratio can explain stock returns just as much as book-to-market ratio. Consistent with Nov-Marx (2013), Fama and French (2015) show that profitability and investment factors diminish the relevancy of book-to-market ratio.

Foerster, Tsagarelis, and Wang (2017) examine various direct method cash flow measures and their predictive power on stock market returns. Foerster, Tsagarelis, and Wang (2017) find that cash flow measures have a significant power in explain stock returns. The sample used by Foerster, Tsagarelis, and Wang (2017) exclude REITs.

There are two REIT specific studies about the relevancy of financial statements information. Fields, Rangan, and Thiagarajan (1998) examine the usefulness of net income and funds from operations. Fields, Rangan, and Thiagarajan (1998) find that funds from operations is not superior to net income. However, Fields, Rangan, and Thiagarajan (1998) do not examine if net income and funds from operations have any association with stock returns. Graham and Knight (2000) find that funds from operations contain superior information as opposed to net income in predicting stock market prices. The sample used in Graham and Knight (2000) covers between 1989 and 1995 and includes 37 REITs. Results are based on regression models rather than portfolios.

The main test hypothesis of this study is that cash flow measures have no significant predictive power on future stock returns considering the existing evidence in the literature.

SAMPLE AND METHODOLOGY

I use COMPUSTAT and CRSP to identify a sample of REITs between 1990 and 2017. There are at most 6,097 firm-years in the initial data set from COMPUSTAT. I then search for the initial sample of REITs in the CRSP database. Characteristics of REITs identified in COMPUSTAT database are shown in Table 1.

I use cash flow measures based on a direct cash flow method as presented by Foerster, Tsagarelis, and Wang (2017). These cash flow measures include CFAF, CFO, CFIM, OP, GP and NI.

CFAF is Net cash flow from operations after financing activities – Capital expenditures. Net cash flow from operations after financing activities is Sales +/- Change in accounts receivable +/- Change in deferred revenues +/- Change in other cash inflows from operations – Cost of goods sold – Selling, general, and administrative expenses +/- Change in accounts pay able from operations +/- Change in inventories – Interest expense +/- Other financing income/expenses.

CFO is Net cash flow from operations – Capital expenditures. Net cash flow from operations is is Sales +/- Change in accounts receivable +/- Change in deferred revenues +/- Change in other cash inflows from operations – Cost of goods sold – Selling, general, and administrative expenses +/- Change in accounts pay able from operations +/- Change in inventories.

CFIM is Operating activities net cash flow – Capital expenditures. Operating activities net cash flow is Net cash flow from operations after financing activities as defined above – Extraordinary activities.

OP is Sales – Cost of goods sold – Selling, general, and administrative expenses.

GP is Sales – Cost of goods sold.

NI is Net income as reported by COMPUSTAT.

I compute REIT funds from operations (FFO) similar to Fields, Rangan, and Thiagarajan (1998). FFO is Net income + Depreciation and Amortization + Extraordinary items and discontinued operations. I add an adjustment to this FFO for straight-line rent reporting. This adjustment is based on Shi and Zhang (2011) accrual measure and it is computed as the difference between income before extraordinary items and net cash flow from operating activities.

These cash flow measures are scaled by the book value of assets or the market value of equity before forming quartile portfolios annually. Returns to these portfolios are tracked for one year. The portfolio formation and return computation processes repeated annually.

The portfolio returns can help establish some association between cash flow measures and stock market returns, however, relevancy of any association depends on whether or not an empirical pricing model can explain the variation in portfolio returns. I use Fama French (1993) three-factor model to evaluate alphas of portfolios formed based on cash flow measures. The Fama French three-factor model is specified as:

$$r_{i,t} - r_{f,t} = \alpha_i + b_i(r_{m,t} - r_{f,t}) + b_i(SML_t) + b_i(HML_t) + \varepsilon_{i,t}$$

where $(r_{m,t} - r_{f,t})$ is the excess return on the market portfolio, SML_t is the return on small vs. large firms and HML_t reflects the return difference between value and growth stocks. The α_i is known as Jensen's alpha and measures if there is any abnormal return.

RESULTS

The sample descriptive characteristics are reported in Table 1. Missing observations on cash flow measures (CFAF, CFO, and CFIM) restrict the sample size significantly. In addition, variables appear to violate normal distribution. As a result, I include REITs with positive cash flow measures in some of the tests.

TABLE 1
DESCRIPTIVE STATISTICS

Variable	N	Mean	Median	Standard Deviation	Minimum	Maximum
CFAF/TA	415	-0.08	0.01	1.61	-32.65	1.29
CFO/TA	418	-0.06	0.04	1.60	-32.57	0.35
CFIM/TA	414	-0.02	0.01	0.37	-6.42	1.78
OP/TA	1,561	0.03	0.04	0.08	-1.43	1.01
GP/TA	6,097	0.03	0.05	1.27	-99.00	2.60
NI/TA	6,097	0.01	0.02	1.32	-99.00	26.06
CFAF/MVE	370	-1.03	0.01	-1.03	-314.17	1.09
CFO/MVE	372	-0.94	0.05	16.35	-313.43	0.94
CFIM/MVE	369	-0.34	0.01	3.65	-61.76	3.45
OP/MVE	1,363	-1.90	0.05	71.11	-2,624.78	19.19
GP/MVE	5,543	2.49	0.09	69.32	-1,593.45	2,863.29
NI/MVE	5,543	-0.40	0.04	69.27	-4,164.60	1,269.88
FFO/TA	5,845	0.00	0.02	2.26	-162.00	51.97
FFO/MVE	5,307	0.36	0.04	89.68	-5,674.16	1,292.76

This table shows the characteristics of REITs included in the initial sample. COMPUSTAT and CRSP databases are used to identify a sample of REITs between 1990 and 2017. Number of firm years varies from 369 to 6,097 depending on the availability of data points. The variables shown in the table are computed in a similar fashion to Foerster, Tsagarelis, and Wang (2017) except for funds from operation (FFO). The paper provides details on determination of these variables. FFO is computed based on the procedure used by Fields, Rangan, and Thiagarajan (1998) and adjusted for accruals as described by Shi and Zhang (2011).

The average monthly returns to quartile portfolios formed based on cash flow measures are reported in Table 2. There returns and standard deviations do not indicate a particular association between the levels of cash flow measures and the future stock returns. This conclusion holds true for cash flow measures scaled by the book value of total assets or the market value of equity.

TABLE 2
RETURN CHARACTERISTICS OF PORTFOLIOS FORMED BASED ON
CASH FLOW MEASURES

	Portfolio number =>	1	2	3	4
Measure	Characteristics	Low			High
	Mean	0.0051	0.0106	0.0051	0.0066
	Median	0.0018	0.0152	0.0069	0.0084
CFAF/TA	Standard Deviation	0.0419	0.0418	0.0392	0.0410
	Maximum	0.1089	0.1121	0.1084	0.1023
	Minimum	-0.0797	-0.0795	-0.0751	-0.0935
	Mean	0.0072	0.0065	0.0069	0.0064
	Median	0.0115	0.0094	0.0091	0.0096
CFO/TA	Standard Deviation	0.0373	0.0418	0.0374	0.0399
	Maximum	0.0891	0.0967	0.1123	0.1138
	Minimum	-0.0738	-0.0664	-0.0724	-0.0724

CFIM/TA	Mean	0.0055	0.0074	0.0078	0.0077
	Median	0.0036	0.0106	0.0062	0.0108
	Standard Deviation	0.0395	0.0387	0.0407	0.0405
	Maximum	0.1060	0.0925	0.1174	0.1177
	Minimum	-0.0797	-0.0851	-0.0729	-0.0921
OP/TA	Mean	0.0110	0.0124	0.0080	0.0086
	Median	0.0137	0.0116	0.0108	0.0103
	Standard Deviation	0.0412	0.0411	0.0402	0.0407
	Maximum	0.1189	0.1392	0.1135	0.1010
	Minimum	-0.0773	-0.0663	-0.0702	-0.0730
GP/TA	Mean	0.0083	0.0109	0.0087	0.0101
	Median	0.0087	0.0142	0.0150	0.0134
	Standard Deviation	0.0599	0.0499	0.0595	0.0531
	Maximum	0.3246	0.2024	0.3442	0.3052
	Minimum	-0.3311	-0.2398	-0.3240	-0.2810
NI/TA	Mean	0.0092	0.0115	0.0084	0.0097
	Median	0.0121	0.0138	0.0109	0.0127
	Standard Deviation	0.0554	0.0595	0.0541	0.0523
	Maximum	0.1980	0.3836	0.2693	0.3017
	Minimum	-0.2719	-0.3297	-0.2831	-0.2860
CFAF/MVE	Mean	0.0085	0.0073	0.0061	0.0055
	Median	0.0039	0.0068	0.0072	0.0030
	Standard Deviation	0.0387	0.0384	0.0404	0.0459
	Maximum	0.1081	0.1090	0.1161	0.1068
	Minimum	-0.0719	-0.0685	-0.0856	-0.0946
CFO/MVE	Mean	0.0067	0.0070	0.0065	0.0070
	Median	0.0065	0.0068	0.0086	0.0089
	Standard Deviation	0.0365	0.0376	0.0398	0.0472
	Maximum	0.0920	0.1102	0.1091	0.1060
	Minimum	-0.0636	-0.0610	-0.0744	-0.0987
CFIM/MVE	Mean	0.0084	0.0046	0.0070	0.0099
	Median	0.0036	0.0068	0.0041	0.0091
	Standard Deviation	0.0407	0.0356	0.0406	0.0446
	Maximum	0.1125	0.0924	0.1171	0.1206
	Minimum	-0.0721	-0.0667	-0.0825	-0.0896
OP/MVE	Mean	0.0104	0.0104	0.0098	0.0082
	Median	0.0128	0.0088	0.0107	0.0143
	Standard Deviation	0.0396	0.0426	0.0449	0.0384
	Maximum	0.1085	0.1620	0.1149	0.0922
	Minimum	-0.0758	-0.0726	-0.0786	-0.0688
GP/MVE	Mean	0.0094	0.0094	0.0094	0.0094
	Median	0.0123	0.0110	0.0142	0.0167
	Standard Deviation	0.0528	0.0545	0.0651	0.0502
	Maximum	0.2165	0.3173	0.3809	0.1409
	Minimum	-0.2709	-0.2993	-0.3834	-0.1994

	Mean	0.0091	0.0100	0.0097	0.0096
	Median	0.0100	0.0117	0.0140	0.0143
NI/MVE	Standard Deviation	0.0570	0.0522	0.0584	0.0532
	Maximum	0.2606	0.2835	0.2627	0.3387
	Minimum	-0.2839	-0.2762	-0.3299	-0.2623

This table shows the return characteristics of quartile portfolios formed based on cash flow measures of REITs. Details of cash flow measures are provided in the paper. The sample period is between 1990 and 2017. Number of monthly return observations varies depending on the availability of cash flow measures. Portfolios are formed annually and returns are computed monthly using market value weights.

The Table 3 shows alphas, p-values, and r-squared estimates of Fama French three-factor model. Interestingly, none of the alphas estimates of quartile portfolio returns are statistically significant. This finding suggests that cash flow measures have not predictive power on returns to portfolios formed based on cash flow measures. It is interesting to note that r-squared values are relatively low for cash flow measures with significant number of missing observations. The use of either the book value of assets or the market value of equity has not impact on the results.

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TABLE 3
ALPHAS OF CASH FLOW BASED PORTFOLIOS

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Measure	Portfolio number =>	1	2	3	4
	Characteristics	Low			High
CFAF/TA	Alpha	-0.0019	0.0035	-0.0029	-0.0033
	P-value	0.7063	0.4891	0.5380	0.5028
	R-squared	0.1530	0.1311	0.1670	0.2157
	N	60	72	72	72
CFO/TA	Alpha	-0.0018	0.0002	-0.0010	-0.0016
	P-value	0.6808	0.9763	0.8353	0.7575
	R-squared	0.2222	0.0914	0.1643	0.1190
	N	72	72	72	72
CFIM/TA	Alpha	-0.0014	-0.0013	-0.0007	0.0002
	P-value	0.7882	0.7765	0.8950	0.9614
	R-squared	0.1786	0.1727	0.1740	0.1361
	N	60	72	72	72
OP/TA	Alpha	-0.0002	0.0026	0.0003	0.0005
	P-value	0.9700	0.5962	0.9548	0.9241
	R-squared	0.3185	0.2261	0.1777	0.1244
	N	72	72	72	72
GP/TA	Alpha	-0.0011	0.0027	0.0000	0.0018
	P-value	0.6481	0.1918	0.9977	0.3869
	R-squared	0.5166	0.4600	0.4503	0.5131
	N	336	336	336	336
NI/TA	Alpha	-0.0001	0.0024	0.0000	0.0018
	P-value	0.9786	0.3145	0.9898	0.4032
	R-squared	0.5028	0.4803	0.4405	0.4620
	N	336	336	336	336

CFAF/MVE	Alpha	0.0020	0.0023	-0.0035	-0.0024
	P-value	0.7137	0.6976	0.4800	-0.0024
	R-squared	0.1994	0.0627	0.1843	0.2473
	N	48	55	72	48
CFO/MVE	Alpha	0.0007	0.0014	-0.0025	-0.0044
	P-value	0.8895	0.7753	0.6086	0.4773
	R-squared	0.2219	0.0828	0.1886	0.5166
	N	48	72	72	60
CFIM/MVE	Alpha	0.0017	-0.0016	-0.0012	0.0039
	P-value	0.7653	0.7484	0.8166	0.5420
	R-squared	0.2306	0.1148	0.1377	0.1879
	N	48	59	72	48
OP/MVE	Alpha	0.0012	0.0027	0.0010	-0.0016
	P-value	0.7912	0.6147	0.8511	0.7308
	R-squared	0.2692	0.1249	0.1578	0.2354
	N	72	72	72	72
GP/MVE	Alpha	0.0005	0.0013	0.0002	0.0012
	P-value	0.8050	0.5770	0.9459	0.5429
	R-squared	0.4512	0.4105	0.4906	0.5234
	N	336	336	336	336
NI/MVE	Alpha	-0.0004	0.0018	0.0009	0.0014
	P-value	0.8628	0.4101	0.7194	0.4838
	R-squared	0.5533	0.4255	0.4437	0.5407
	N	336	336	336	336

This table reports of alphas and p-values based on Fama French three-factor model that includes market, size, book-to-market, and momentum factors. The sample period is between 1990 and 2017. The sample size for each cash flow based portfolio reflects the number of months portfolio returns are computed. The dependent variable in the Fama French three-factor model is the value-weighted portfolio returns formed based on cash flow measures.

These findings are largely not consistent with Foerster, Tsagarelis, and Wang (2017) that cash flow measures can predict future stock returns. The results reported here are consistent with Foerster, Tsagarelis, and Wang (2017) for CFIM/TA, OP/TA, and GP/MVE.

These insignificant results may be reflective of the main characteristic of the sample. It is possible that these cash flow measures do not capture the cash flow potential of REITs that must mostly invest in real estate and return significant portion of its profits to shareholders. If Foerster, Tsagarelis, and Wang (2017) cash flow measures are not useful for REITs then it is possible to observe a pattern for a cash flow measure that is more specific to REITs. The REIT specific cash flow measure is based on funds from operations scaled by the book value of assets or the market value of equity.

The results of tests based on FFO is reported in Table 4. The Panel A of the Table reports the average monthly returns to portfolios formed base on REIT FFO. Panel B shows alphas, p-values, and r-squared of Fama French three-factor model regressions. Panel A does not indicate any pattern between portfolio returns and FFO. In addition, none of the alphas from the Fama French three-factor model regressions is significant.

TABLE 4
RETURN CHARACTERISTICS AND ALPHAS OF PORTFOLIOS FORMED BASED ON FUNDS FROM OPERATIONS (FFO)

	Portfolio number =>	1	2	3	4
Measure	Characteristics	Low			High
Panel A. Return characteristics portfolios formed based on FFO					
	Mean	0.0102	0.0107	0.0092	0.0098
	Median	0.0143	0.0134	0.0108	0.0118
FFO/TA	Standard Deviation	0.0579	0.0595	0.0538	0.0509
	Maximum	0.2814	0.3400	0.2847	0.2950
	Minimum	-0.2896	-0.2971	-0.3040	-0.2889
	Mean	0.0095	0.0100	0.0091	0.0101
	Median	0.0111	0.0126	0.0107	0.0136
FFO/MVE	Standard Deviation	0.0589	0.0569	0.0522	0.0556
	Maximum	0.3162	0.2780	0.2459	0.3518
	Minimum	-0.2913	-0.2696	-0.3242	-0.3061
Panel B. Alphas of FFO based portfolios					
	Alpha	0.0007	0.0020	0.0007	0.0020
FFO/TA	P-value	0.7588	0.4135	0.7583	0.3321
	R-squared	0.5194	0.4586	0.4476	0.4736
	N	336	336	336	336
	Alpha	0.0020	-0.0005	0.0020	0.0013
FFO/MVE	P-value	0.4059	0.8446	0.3542	0.5513
	R-squared	0.4451	0.4023	0.4930	0.5371
	N	336	336	336	336

The Panel A of the table shows the return characteristics of quartile portfolios formed based on funds from operations of REITs. Details of FFO computation are provided in the paper. The sample period is between 1990 and 2017. Number of monthly return observations varies depending on the availability of cash flow measures. Portfolios are formed annually and returns are computed monthly using market value weights. Panel B of the table reports of alphas and p-values based on Fama French three-factor model that includes market, size, book-to-market, and momentum factors. The dependent variable in the Fama French three-factor model is the value-weighted portfolio returns formed based on funds from operations.

The evidence reported in this paper suggests that the information content of REIT cash flow measures including FFO is very low. This makes several explanations possible. First, the market participants are very effective in predicting the financial statements information before they are available to investors. Second, any new information made available through the financial statements are incorporated quickly that the research design does not capture the adjustment. Third, annual financial statements are not as informative as quarterly financial statements. All of these explanations require further research.

CONCLUSIONS

I investigate the link between cash flow measures based on financial statements and future stock returns of REITs. I find that various cash flow measures for REITs do not provide information that may predict stock market returns. Even the REIT specific cash flow measure, funds from operations, does not change this finding. It is possible that either market environment or research design or both may have led

to these results. Regardless, further research can discover findings that can provide better understanding of the link between cash flows and stock market returns.

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