Online Appendix for

The Price of Skill:

Performance Evaluation by Households

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This document contains two sections that elaborate on the analysis in "The Price of Skill: Performance Evaluation by Households". The first solves the portfolio-choice problem of a household with non-traded income. The results connect shocks to beliefs and rebalancing in greater detail than in the paper. The second section presents a set of robustness checks and extensions of the empirical analysis.

1. Flows in a portfolio model with non-traded income

Section 2.3 in the paper connects belief shocks and changes in stochastic discount factor exposures. Here, I show directly how these loadings can be interpreted as time-varying portfolio weights. The solution closely follows Campbell and Viceira (1999) and Viceira

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(2001).

Consider an infinitely-lived CRRA household,

$$U\left(\{C_t\}_{t=0}^{\infty}\right) = E_0\left[\sum_{t=0}^{\infty}\frac{C_t^{1-\gamma}}{1-\gamma}\right]. \tag{1}$$

Each period, the household receives non-traded income $Y_t = e^{y_t}$ and chooses consumption $C_t = e^{c_t}$ and a fraction $\omega_{S,t}$ of savings to invest in stocks so that wealth $W_t = e^{w_t}$ follows

$$W_{t+1} = (W_t + Y_t - C_t)\left[R_f + \omega_{S,t}\left(R_{t+1} - R_f\right)\right] \tag{2}$$

$$= (W_t + Y_t - C_t)\, R_{t+1}^W, \tag{3}$$

where $R_f = e^{r_f}$, $R = e^r$. Campbell and Viceira (1999) obtain tractability by log-linearizing the log-return on savings $r^W = \log R^W$:

$$r_{t+1}^W \approx r_f + \omega_{S,t}\left(r_{t+1} - r_f\right) + \frac{1}{2}\omega_{S,t}\left(1 - \omega_{S,t}\right)\widehat{\sigma}_r^2. \tag{4}$$

This approximation holds exactly in continuous time. The budget equation can similarly be log-linearized as

$$w_{t+1} - y_{t+1} \approx r_{t+1}^W - \Delta y_{t+1} + k_0 + k_1\Big[\left(w_t - y_t\right) - \left(c_t - y_t\right)\Big], \tag{5}$$

where $k_0 = \log\left(1 + e^{\overline{w-y}} - e^{\overline{c-y}}\right) + k_1\left(\overline{w-y} - \overline{c-y}\right)$ and $k_1 = \frac{e^{\overline{w-y}} - e^{\overline{c-y}}}{1+e^{\overline{w-y}} - e^{\overline{c-y}}}$ are constants that depend on the average non-traded income to wealth and consumption to wealth ratios.

The household stochastic discount factor is

$$\Delta m_{t+1} = -\gamma \Delta c_{t+1}. \tag{6}$$

Conjecture a solution of the form

$$c_t - y_t = c_0 + \left(1 - \frac{1}{k_1}\right)(w_t - y_t) + c_1 \widehat{x}_t + c_2 \widehat{x}_t^2 \tag{7}$$

$$\omega_{S,t} = \omega_0 + \omega_1 \widehat{x}_t. \tag{8}$$

Substituting into the budget equation,

$$\begin{aligned} w_{t+1} - y_{t+1} \approx\ & (k_0 - k_1 c_0) + r_{t+1}^W - \Delta y_{t+1} + (w_t - y_t) \\ & -k_1 \left(c_1 \widehat{x}_t + c_2 \widehat{x}_t^2\right). \end{aligned} \tag{9}$$

Consumption growth is trivially

$$\Delta c_{t+1} = \Delta \left(c_{t+1} - y_{t+1}\right) + \Delta y_{t+1} \tag{10}$$

$$= \left(1 - \frac{1}{k_1}\right) \Delta \left(w_{t+1} - y_{t+1}\right) + \Delta y_{t+1} + c_1 \Delta \widehat{x}_{t+1} + c_2 \Delta \widehat{x}_{t+1}^2 \tag{11}$$

$$= (k_0 - k_1 c_0)\left(1 - \frac{1}{k_1}\right) + \left(1 - \frac{1}{k_1}\right) r_{t+1}^W + \frac{1}{k_1} \Delta y_{t+1} + c_1 \Delta \widehat{x}_{t+1} + c_2 \Delta \widehat{x}_{t+1}^2. \tag{12}$$

The price of non-traded risk depends on $1/k_1$, which measures the labor income share of wealth. An investor with a higher non-traded income share is more averse to non-traded income risk and therefore more willing to invest with active funds, which provide a partial

hedge.

Following Campbell and Viceira (2002), note that

$$\begin{aligned}
\Delta\widehat{x}_{t+1}^2 &= \widehat{x}_{t+1}^2 - \widehat{x}_t^2 && (13)\\
&= \left(\rho\widehat{x}_t + \widehat{\epsilon}_{t+1}^x\right)^2 - \widehat{x}_t^2 && (14)\\
&= \left(\rho^2 - 1\right)\widehat{x}_t^2 + \rho\widehat{x}_t\widehat{\epsilon}_{t+1}^x + \left(\widehat{\epsilon}_{t+1}^x\right)^2. && (15)
\end{aligned}$$

Therefore,

$$\begin{aligned}
E_t\left[\Delta\widehat{x}_{t+1}^2\right] &= \left(\rho^2 - 1\right)\widehat{x}_t^2 + \widehat{\sigma}_x^2 && (16)\\
Var_t\left(\left(\widehat{\epsilon}_{t+1}^x\right)^2\right) &= 2\widehat{\sigma}_x^4 && (17)\\
Cov_t\left(\left(\widehat{\epsilon}_{t+1}^x\right)^2, \widehat{\epsilon}_{t+1}^x\right) &= 0. && (18)
\end{aligned}$$

The Euler equation for stocks is

$$\begin{aligned}
E_t\left[r_{t+1}\right] + \frac{1}{2}Var_t\left(r_{t+1}\right) - r_f &= \gamma Cov_t\left(\Delta c_{t+1}, r_{t+1}\right) && (19)\\
\overline{r} - \phi\widehat{x}_t + \frac{1}{2}\widehat{\sigma}_r^2 - r_f &= \gamma\left[\left(1 - \frac{1}{k_1}\right)\omega_{S,t}\widehat{\sigma}_r^2 + \frac{1}{k_1}\widehat{\sigma}_{ry} + \left(c_1 + c_2\rho\widehat{x}_t\right)\widehat{\sigma}_{rx}\right]. && (20)
\end{aligned}$$

Therefore,

$$\omega_{S,t} = \frac{k_1}{k_1 - 1}\left[\frac{1}{\gamma}\left(\frac{\overline{r} - \phi\widehat{x}_t + \frac{1}{2}\widehat{\sigma}_r^2 - r_f}{\widehat{\sigma}_r^2}\right) - \left(c_1 + c_2\rho\widehat{x}_t\right)\left(\frac{\widehat{\sigma}_{rx}}{\widehat{\sigma}_r^2}\right)\right] - \frac{1}{k_1 - 1}\left(\frac{\widehat{\sigma}_{ry}}{\widehat{\sigma}_r^2}\right). \quad (21)$$

This gives ω_0 and ω_1. The Euler equation for bonds is

$$r_f = \gamma E_t\left[\Delta c_{t+1}\right] - \frac{\gamma^2}{2} Var_t\left(\Delta c_{t+1}\right). \tag{22}$$

Substitute for r^W and calculate

$$\begin{aligned} E_t\left[\Delta c_{t+1}\right] &= \left(k_0 - k_1 c_0\right)\left(1 - \frac{1}{k_1}\right) \\ &+ \left(1 - \frac{1}{k_1}\right)\left[r_f + \omega_{S,t}\left(\overline{r} - \phi\widehat{x}_t + \frac{1}{2}\widehat{\sigma}_r^2 - r_f\right) - \frac{1}{2}\omega_{S,t}^2\widehat{\sigma}_r^2\right] \\ &+ \frac{1}{k_1}\rho\widehat{x}_t + c_1\rho\widehat{x}_t + c_2\left[\left(\rho^2 - 1\right)\widehat{x}_t^2 + \widehat{\sigma}_x^2\right]. \end{aligned} \tag{23}$$

Furthermore,

$$\begin{aligned} Var_t\left(\Delta c_{t+1}\right) &= Var_t\left[\left(1 - \frac{1}{k_1}\right) r_{t+1}^W + \frac{1}{k_1}\Delta y_{t+1} + c_1\Delta\widehat{x}_{t+1} + c_2\Delta\widehat{x}_{t+1}^2\right] & (24) \\ &= \left(1 - \frac{1}{k_1}\right)^2 \omega_{S,t}^2\widehat{\sigma}_r^2 + \left(\frac{1}{k_1}\right)^2\widehat{\sigma}_y^2 + c_1^2\widehat{\sigma}_x^2 + 2c_2^2\widehat{\sigma}_x^4 & (25) \\ &+ 2\frac{1}{k_1}\left(1 - \frac{1}{k_1}\right)\omega_{S,t}\widehat{\sigma}_{ry} + 2\left(1 - \frac{1}{k_1}\right)\left(c_1 + c_2\rho\widehat{x}_t\right)\omega_{S,t}\widehat{\sigma}_{rx} \\ &+ 2\frac{1}{k_1}\left(c_1 + c_2\rho\widehat{x}_t\right)\widehat{\sigma}_{ry} + \rho\widehat{x}_t\widehat{\sigma}_x^2. \end{aligned}$$

All terms are either constant, linear, or quadratic in $\widehat{x}_t$. Matching coefficients gives a system of equations in c_0, c_1, and c_2. Finding the roots of these equations verifies the conjecture.

Equation (21) shows that demand for stocks is driven by expected returns, intertemporal hedging, and static non-traded income hedging.

Consider a history of shocks such that $\widehat{x} > x$. According to (21), households anticipate low expected returns and reduce their stock exposure. At the same time, active fund managers

invest more aggressively. This gives rise to fund outflows. In subsequent periods, active fund returns are relatively high, and this happens precisely when non-traded income disappoints.

2. Robustness and extensions of the empirical results

Excluding retirement funds. Index funds, more so than active funds, receive substantial inflows from pre-determined contributions to retirement savings plans. To see if retirement fund contributions are related to the main results of the paper, Tables 1–3 redo Tables III–V in the paper while excluding all funds classified as "available for retirement plan" in Morningstar. The results are fully consistent with the specifications in the paper. Note, however, that in the model it is precisely investors whose flows are deterministic ("buy-and-hold" investors), who are attracted to index funds, so the popularity of index funds for investors with stable income flows can be interpreted as a prediction of the model.

Excluding small-cap and sector funds. Many index funds explicitly target the S&P 500, a large-cap index. Indeed, Table II in the paper shows than index funds have a negative loading on SMB, whereas active funds have a positive one. To see if the small-stock bias of active funds is related to the main results of the paper, in Tables 4–6 I exclude funds that primarily invest in stocks with market capitalization less than $1 billion and sector funds. The relationship between flows and contemporaneous returns is essentially unchanged from the paper. The results for predicting market returns with flows are a bit stronger at the six-month horizons and a bit weaker at the twelve-month horizon. The results on predicting active-minus-index returns are somewhat weaker than in the paper, though the statistical significance is preserved.

Within the context of the model, it is possible that investors with substantial non-traded risk are drawn to smaller stocks for hedging purposes (for example most employment is in large firms). Fama and French (1992) suggest that the size premium may be due to economic risk not captured by market beta. This could explain the higher tendency of active funds to invest in small stocks as they cater to investors with substantial non-traded risk. A second possibility is that the expected returns of small stocks might be subject to greater uncertainty, creating greater opportunity for active trading.

Excluding institutional funds. It is possible that active funds and index funds have different investor bases in ways not directly captured by the model. For example, they might face a different break-down between institutional and retail clients. To see if the results hold within the retail fund sector, Tables 7–9 exclude all institutional share classes. The contemporaneous flow-return relationship is not affected, the R^2s are marginally higher. In the market-forecasting regressions, the coefficients on active funds are a bit smaller, leading to lower significance at the six-month horizon, but the coefficients on index funds are also smaller by a similar amount. In the regressions of active-minus-index returns, a similar pattern emerges, though no statistical significance is lost.

Morningstar classifies funds as institutional if they are run for clients with fiduciary obligations, or if they have minimum balance requirements in excess of $100,000. This means that many wealthy individuals are classified as institutional investors. From the perspective of the model, one can argue that wealthy investors are more likely to be informed about expected returns, but it is also possible that they have substantial outside income from private business or other non-traded income. These alternative interpretations make it

difficult to predict whether institutional investors should prefer active of index funds.

Conditioning on the lagged market return. Tables 10–13 extend the analysis by considering up- and down- markets separately by adding the lagged market return over the previous year as an additional control, as well as interacting it with the other regressors. The $p - d$ ratio is removed as it is closely related to the lagged return. In the market return forecasting regressions, Table 10, significant power is lost and flows remain significant only at the twelve-month horizon. The magnitudes are essentially unchanged at the shorter horizons and actually higher at the 12-month horizon. The past market return is insignificant, as is the interaction term.

The regressions forecasting the active-minus-market return in Table 11 become significantly stronger, both the magnitudes and significance of the forecasting coefficients grows. In particular, there is some forecastability at the 12-month horizon. Even index fund flows are significant but their coefficients are always at least three times smaller. The lagged market return comes in with a negative sign and is significant at the 12-month horizon. This result is consistent with decreasing returns to scale and the graphical evidence in Figure 3 in the paper; active funds do better in down markets. The interaction term is insignificant.

The estimates of the conditional FLO premium are in Table 12. The intercepts are all more negative than in the unconditional model and the coefficient on the lagged market return is positive, so that the FLO premium is larger in down markets. According to the model, this indicates that non-traded risk premia also increase when traded risk premia are high. A general rise in volatility across the whole economy, or an increase in risk aversion could generate this effect. The results also show that the betas of FLO on value and

momentum are somewhat more negative in down markets.

Turning to the results for pricing active funds in Table 13, including FLO in a conditional model has a larger impact on measured performance. Alphas rise by between 6 and 12 basis points. The model lacks power, however, so statistical significance is reduced. Interestingly, the active-minus-market strategy has a higher market beta in down markets but a lower size beta. The FLO beta remains highly significant and constant across states.

Bond funds. As an out-of-sample extension, Tables 14–20 reproduce the analysis of the paper within the context of corporate bond mutual funds. The main complication in dealing with bond funds is that it is not clear whether they are closer to the risky or risk-free assets of the model. If they are risk-free, then bond fund flows would move against equity fund flows (though in practice flows can also come from outside the mutual fund sector), and they would not predict bond market returns (which are constant in the model). If they are risky, then they would co-move with equity fund flows and have similar predictability. In the data, the correlation between equity fund flows and bond fund flows is close to zero at about 12%, which is consistent with the idea that bonds represent an intermediate asset. For index funds, however, this correlation is 40%, suggesting that index fund investors treat stocks and bonds more similarly than do active fund investors.

For the purposes of this exercise, I exclude Treasury and municipal bond funds and mortgage-backed funds. This leaves corporate bond funds, which attract significant active trading. I use the Barclays Corporate Bond Market Index as a market index measure in addition to the CRSP equity index. As additional factors, I consider a high yield strategy long the Barclays High Yield Bond Index and short the Corporate Bond Market Index; a term

strategy long the Barclays Long Maturity Corporate Bond Index and short the Corporate Bond Market Index; and a treasury factor long the Barclays Treasury Index and short the Corporate Bond Market Index (though I exclude explicit Treasury funds, many funds have some Treasury holdings). Previous studies have used similar factors (e.g. Blake, Elton, and Gruber (1993, 1995)). The literature generally finds small negative alphas for bond funds (Elton and Gruber 2011) of between 50 and 100 basis points per year.

Table 14 presents summary statistics. Index bond fund flows have a lower mean than active funds, lower autocorrelation, and higher standard deviation. Their average returns are virtually the same as active bond funds but their volatility is a bit lower.

Performance results are in Table 15. The CAPM produces high positive alphas as it does not capture much of the variation of bond fund returns. Note, however, that the alphas of active funds are already lower than index funds, as with equity funds. Adding the aggregate bond market factor drives down the alphas of active funds to near zero but leaves positive alphas for index funds. The specifications with the full set of factors bring the alphas down further as bond funds, active funds in particular, load heavily on the high-yield strategy. Both types load on Treasurys, index funds in particular. In the full specification, active funds have a marginally significant negative alpha versus a tiny positive alpha for index funds (the long-short is significant, see Table 20). The performance regressions show that the under-performance puzzle is present but somewhat weaker both statistically and economically among bond funds: Active bond funds under-perform index bond funds by four to seven basis points per month versus six to ten basis points for equity funds.

Turning to the relationship between flows and contemporaneous bond market returns, the results in Table 16 are the same as for equity funds, consistent with the model: active

fund flows are strongly related to contemporaneous bond market returns, whereas index fund flows are not.

Table 17 shows forecasting regressions of future bond market returns on today's flows. Results here differ from the equity fund analysis. In particular, index fund flows negatively forecast bond market returns, whereas active fund flows do not. The model generates negative predictability, but investors who are most susceptible to it select active funds. The results here suggest that while there is evidence of the flows dynamics predicted by the model, the optimal matching of investors and funds is not operating as it does with equity funds. A possible explanation is that active fund investors might treat bonds as a safe asset, switching between stocks and bonds, rather than as a risky asset (this would happen for if for example active fund investors tend to be less risk averse). Consistent with this, active bond and equity fund flows are less correlated than index bond and equity fund flows. In any case, despite the high buy-and-hold index fund returns, index fund investors, due to the timing of their flows, are not necessarily outperforming active fund investors. In the model, selection mitigates this effect, whereas here it remains strong.

Table 18 shows forecasting regressions of future active bond returns in excess of the bond market on today's flows. As with equities, high active fund flows predict relatively high active fund returns versus the market. The statistical significance is somewhat lower than with equities (except at the twelve-month horizon where it is stronger), but the results are broadly consistent, especially recalling that the under-performance puzzle itself is weaker for bond funds. Interestingly, index fund flows also seem to forecast high active fund returns relative to the market, again suggesting with weaker matching between funds and investors in the bond fund market. That said, after controlling for current yields, the forecasting

power of index fund flows declines whereas that of active fund flows tends to strengthen.

Table 19 shows the relationship between the fund flows factor FLO and the bond market factors. I continue to rely on the equity-based FLO factor for consistency with the main results of the paper. As with equities, the premium on FLO is robust and is not subsumed by any of the other factors. Interestingly, FLO is strongly correlated with the high-yield strategy, indicating that stocks whose returns co-vary with equity fund flows also co-vary with high-yield bonds (recall a similar result for SMB in the paper).

Table 20 uses the fund flows factor FLO to price active and index bond funds. In every specification, adding FLO reduces the performance gap between the two groups by between one and five basis points per month. Only the full specification alpha is significant, and that one is reduced by the smallest amount. The reason is the high correlation between FLO and the high-yield factor, which reduces its marginal impact on pricing.

Overall, the results for bond funds are largely similar to those for equity funds, except for the matching between funds and investors. The differences may be due to the nature of bonds as an asset class with an intermediate level of risk.

References

Blake, Christopher R., Edwin J. Elton, and Martin J. Gruber, 1993. The performance of bond mutual funds. The Journal of Business 66, pp. 371–403.

——— , 1995. Fundamental economic variables, expected returns, and bond fund performance. The Journal of Finance 50, 1229–1256.

Campbell, J.Y., and L.M. Viceira, 1999. Consumption and portfolio decisions when expected returns are time varying. Quarterly Journal of Economics 114, 433–495.

——— , 2002. Strategic asset allocation: portfolio choice for long-term investors Oxford University Press, USA.

Elton, Edwin J., and Martin J. Gruber, 2011. Mutual Funds. Financial Markets and Asset Pricing: Handbook of Economics and Finance, forthcoming.

Fama, Eugene F., and Kenneth R. French, 1992. The cross-section of expected stock returns. The Journal of Finance 47, 427–465.

Viceira, Luis M., 2001. Optimal portfolio choice for long-horizon investors with nontradable labor income. The Journal of Finance 56, 433–470.

Table 1: **Fund flows and contemporaneous returns, no retirement funds**

This table shows the correlation between fund flows and contemporaneous market returns, excluding funds available in retirement plans. Flows are measured as net cash flows over lagged assets, net of a 12-month moving average. "All flow" are the percentage flows of a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of all active funds and index funds, respectively. R^M is the CRSP value-weighted market return in the same month as the fund flows. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	R_t^M	R_t^M	R_t^M	R_t^M
Constant	0.91***	0.91***	0.86***	0.91***
	(0.27)	(0.27)	(0.30)	(0.27)
All flow$_t$	3.34***			
	(0.58)			
Active flow$_t$		3.32***		3.20***
		(0.57)		(0.64)
Index flow$_t$			0.81***	0.15
			(0.17)	(0.18)
R^2	16%	16%	4%	16%
N	277	277	277	277

Table 2: **Predicting market returns with fund flows, no retirement funds**

Regressions of future market returns on current flows, excluding funds available in retirement plans. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. R^M is the return on the market portfolio from CRSP over a 3, 6, and 12-month horizon. $p-d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.53***	20.67**	5.07***	44.77**	10.72***	99.25***
	(0.87)	(9.63)	(1.71)	(17.60)	(3.20)	(28.32)
$All\ flow_t$	−0.86	−0.85	−3.41*	−3.40*	−4.78**	−4.74**
	(1.24)	(1.26)	(1.93)	(1.85)	(2.42)	(2.10)
$(p-d)_t$		−4.64*		−10.14**		−22.63***
		(2.48)		(4.58)		(7.47)
R^2	0%	3%	2%	9%	2%	18%
	Active fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.53***	20.63**	5.08***	44.59**	10.72***	99.01***
	(0.87)	(9.63)	(1.71)	(17.61)	(3.20)	(28.28)
$Active\ flow_t$	−0.91	−0.88	−3.30*	−3.25*	−4.93**	−4.81**
	(1.26)	(1.29)	(1.91)	(1.86)	(2.43)	(2.15)
$(p-d)_t$		−4.63*		−10.10**		−22.56***
		(2.48)		(4.58)		(7.46)
R^2	0%	3%	2%	9%	2%	18%

(Continued on next page)

Table 2—*Continued*

	Index fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.56***	20.68**	5.12***	45.95***	10.85***	100.11***
	(0.87)	(9.59)	(1.72)	(17.65)	(3.21)	(28.41)
$Index\ flow_t$	0.13	0.03	−0.90	−1.12*	−0.19	−0.68
	(0.33)	(0.34)	(0.75)	(0.63)	(1.07)	(0.83)
$(p-d)_t$		−4.63*		−10.44**		−22.82***
		(2.44)		(4.54)		(7.57)
R^2	0%	3%	1%	8%	0%	16%
	Active and index fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.54***	20.37**	5.07***	45.16**	10.75***	98.63***
	(0.87)	(9.59)	(1.72)	(17.65)	(3.21)	(28.41)
$Active\ flow_t$	−1.21	−1.09	−3.08	−2.80	−5.73**	−5.11**
	(1.41)	(1.44)	(1.92)	(1.96)	(2.80)	(2.49)
$Index\ flow_t$	0.38	0.26	−0.27	−0.54	0.98	0.37
	(0.38)	(0.40)	(0.73)	(0.67)	(1.22)	(0.98)
$(p-d)_t$		−4.56*		−10.25**		−22.46***
		(2.47)		(4.59)		(7.51)
R^2	1%	3%	2%	9%	3%	18%
N (all panels)	274	274	271	271	265	265

Table 3: **Predicting active-minus-market returns with fund flows, no retirement funds**

Regressions of future active fund returns in excess of the market on current flows, excluding funds available in retirement plans. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. $R^A - R^M$ is the return on a strategy long the value-weighted active fund portfolio and short the market over a 3, 6, and 12-month horizon. $p - d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.23	−1.37	−0.48	−2.74	−1.10	−8.52
	(0.18)	(2.31)	(0.37)	(4.54)	(0.76)	(7.88)
All flow$_t$	0.53***	0.53***	0.86**	0.86***	0.92	0.92
	(0.20)	(0.19)	(0.34)	(0.33)	(0.63)	(0.59)
$(p-d)_t$		0.29		0.58		1.90
		(0.59)		(1.16)		(2.00)
R^2	3%	4%	3%	4%	1%	4%
	Active fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.23	−1.35	−0.48	−2.70	−1.10	−8.48
	(0.18)	(2.30)	(0.37)	(4.53)	(0.76)	(7.86)
Active flow$_t$	0.54***	0.54***	0.86**	0.86**	0.92	0.91
	(0.20)	(0.19)	(0.35)	(0.33)	(0.64)	(0.61)
$(p-d)_t$		0.28		0.57		1.88
		(0.59)		(1.15)		(2.00)
R^2	3%	4%	3%	4%	1%	4%

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Table 3—*Continued*

	Index fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.24	−1.48	−0.50	−2.94	−1.13	−8.67
	(0.19)	(2.43)	(0.38)	(4.74)	(0.78)	(8.17)
$Index\ flow_t$	0.09	0.09	0.16	0.18	0.08	0.12
	(0.09)	(0.08)	(0.17)	(0.16)	(0.27)	(0.27)
$(p-d)_t$		0.32		0.63		1.93
		(0.62)		(1.21)		(2.07)
R^2	0%	1%	1%	1%	0%	2%
	Active and index fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.23	−1.33	−0.48	−2.70	−1.11	−8.39
	(0.18)	(2.26)	(0.37)	(4.47)	(0.76)	(7.86)
$Active\ flow_t$	0.55**	0.55**	0.87**	0.86**	1.03	0.98
	(0.24)	(0.22)	(0.43)	(0.41)	(0.75)	(0.72)
$Index\ flow_t$	−0.03	−0.02	−0.01	0.00	−0.14	−0.08
	(0.11)	(0.10)	(0.21)	(0.19)	(0.31)	(0.32)
$(p-d)_t$		0.28		0.57		1.86
		(0.58)		(1.14)		(2.00)
R^2	3%	4%	3%	4%	2%	4%
N (all panels)	274	274	271	271	265	265

Table 4: **Fund flows and contemporaneous returns, no small-cap or sector funds**

This table shows the correlation between fund flows and contemporaneous market returns, excluding funds that invest primarily in small stocks (less than $1 billion) and sector funds. Flows are measured as net cash flows over lagged assets, net of a 12-month moving average. "All flow" are the percentage flows of a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of all active funds and index funds, respectively. R^M is the CRSP value-weighted market return in the same month as the fund flows. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	R_t^M	R_t^M	R_t^M	R_t^M
Constant	0.92***	0.92***	0.86***	0.92***
	(0.27)	(0.27)	(0.30)	(0.27)
$All\ flow_t$	3.40***			
	(0.64)			
$Active\ flow_t$		3.41***		3.28***
		(0.63)		(0.74)
$Index\ flow_t$			0.76***	0.14
			(0.18)	(0.21)
R^2	14%	14%	3%	14%
N	277	277	277	277

Table 5: **Predicting market returns with fund flows, no small-cap or sector funds**

Regressions of future market returns on current flows, excluding funds that invest primarily in small stocks (less than $1 billion) and sector funds. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. R^M is the return on the market portfolio from CRSP over a 3, 6, and 12-month horizon. $p - d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.52***	20.69**	5.05***	44.79**	10.72***	99.33***
	(0.87)	(9.58)	(1.70)	(17.44)	(3.19)	(28.27)
$All\ flow_t$	−0.93	−0.93	−3.74*	−3.74*	−4.63*	−4.64**
	(1.32)	(1.37)	(2.06)	(1.99)	(2.50)	(2.23)
$(p-d)_t$		−4.64*		−10.16**		−22.65***
		(2.46)		(4.53)		(7.45)
R^2	0%	3%	2%	9%	2%	18%
	Active fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.52***	20.62**	5.06***	44.54**	10.71***	98.99***
	(0.87)	(9.57)	(1.70)	(17.43)	(3.19)	(28.20)
$Active\ flow_t$	−0.99	−0.95	−3.67*	−3.60*	−4.89*	−4.73**
	(1.38)	(1.44)	(2.04)	(2.01)	(2.53)	(2.31)
$(p-d)_t$		−4.63*		−10.09**		−22.56***
		(2.46)		(4.53)		(7.44)
R^2	0%	3%	2%	9%	2%	18%

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Table 5—*Continued*

	Index fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.56***	20.74**	5.11***	46.00***	10.85***	100.19***
	(0.87)	(9.49)	(1.70)	(17.51)	(3.21)	(28.81)
$Index\ flow_t$	0.08	−0.03	−0.87	−1.11*	−0.21	−0.73
	(0.33)	(0.35)	(0.74)	(0.62)	(1.08)	(0.83)
$(p-d)_t$		−4.65*		−10.45**		−22.84***
		(2.44)		(4.54)		(7.58)
R^2	0%	3%	1%	8%	0%	16%
	Active and index fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.53***	20.42**	5.05***	45.11***	10.74***	98.76***
	(0.87)	(9.51)	(1.72)	(17.46)	(3.20)	(28.35)
$Active\ flow_t$	−1.27	−1.12	−3.46*	−3.12	−5.68*	−4.93*
	(1.62)	(1.67)	(2.08)	(2.13)	(2.97)	(2.72)
$Index\ flow_t$	0.31	0.18	−0.23	−0.52	0.86	0.22
	(0.44)	(0.45)	(0.74)	(0.66)	(1.24)	(1.00)
$(p-d)_t$		−4.57*		−10.24**		−22.50***
		(2.45)		(4.54)		(7.49)
R^2	0%	3%	2%	9%	2%	18%
N (all panels)	274	274	271	271	265	265

Table 6: **Predicting active-minus-market returns with fund flows, no small-cap or sector funds**

Regressions of future active fund returns in excess of the market on current flows, excluding funds that invest primarily in small stocks (less than $1 billion) and sector funds. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. $R^A - R^M$ is the return on a strategy long the value-weighted active fund portfolio and short the market over a 3, 6, and 12-month horizon. $p - d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.25*	−1.03	−0.53*	−2.22	−1.18	−7.23
	(0.15)	(1.89)	(0.30)	(3.69)	(0.62)	(6.45)
All flow$_t$	0.40**	0.40**	0.63**	0.63**	0.74	0.74
	(0.18)	(0.18)	(0.29)	(0.28)	(0.56)	(0.54)
$(p-d)_t$		0.20		0.43		1.55
		(0.48)		(0.94)		(1.62)
R^2	2%	2%	2%	3%	1%	3%
	Active fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.25*	−1.00	−0.58	−2.17	−1.18*	−7.18
	(0.15)	(1.88)	(0.30)	(3.67)	(0.62)	(6.42)
Active flow$_t$	0.40**	0.40**	0.63**	0.63**	0.75	0.74
	(0.18)	(0.18)	(0.31)	(0.30)	(0.59)	(0.57)
$(p-d)_t$		0.19		0.42		1.53
		(0.48)		(0.93)		(1.62)
R^2	2%	2%	1%	3%	1%	3%

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Table 6—*Continued*

	Index fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.26*	−1.11	−0.54*	−2.35	−1.20	−7.30
	(0.16)	(1.93)	(0.31)	(3.78)	(0.63)	(6.63)
$Index\ flow_t$	0.07	0.07	0.11	0.12	0.01	0.05
	(0.08)	(0.07)	(0.14)	(0.13)	(0.22)	(0.23)
$(p-d)_t$		0.22		0.46		1.56
		(0.49)		(0.95)		(1.66)
R^2	0%	1%	0%	1%	0%	2%
	Active and index fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.25*	−0.99	−0.53*	−2.18	−1.19*	−7.05
	(0.15)	(1.85)	(0.30)	(3.63)	(0.61)	(6.41)
$Active\ flow_t$	0.41*	0.41**	0.64*	0.63*	0.90	0.85
	(0.22)	(0.21)	(0.39)	(0.37)	(0.73)	(0.73)
$Index\ flow_t$	−0.01	−0.01	−0.01	0.00	−0.16	−0.12
	(0.09)	(0.09)	(0.17)	(0.16)	(0.28)	(0.29)
$(p-d)_t$		0.19		0.42		1.50
		(0.47)		(0.92)		(1.61)
R^2	2%	2%	2%	3%	1%	4%
N (all panels)	274	274	271	271	265	265

Table 7: **Fund flows and contemporaneous returns, no institutional funds**

This table shows the correlation between fund flows and contemporaneous market returns, excluding share classes marked as institutional. Flows are measured as net cash flows over lagged assets, net of a 12-month moving average. "All flow" are the percentage flows of a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of all active funds and index funds, respectively. R^M is the CRSP value-weighted market return in the same month as the fund flows. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	R_t^M	R_t^M	R_t^M	R_t^M
Constant	0.93***	0.92***	0.86***	0.92***
	(0.27)	(0.27)	(0.30)	(0.27)
All flow$_t$	3.38***			
	(0.58)			
Active flow$_t$		3.36***		3.31***
		(0.57)		(0.61)
Index flow$_t$			0.76***	0.07
			(0.18)	(0.16)
R^2	17%	17%	2%	17%
N	277	277	277	277

Table 8: **Predicting market returns with fund flows, no institutional funds**

Regressions of future market returns on current flows, excluding share classes marked as institutional. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. R^M is the return on the market portfolio from CRSP over a 3, 6, and 12-month horizon. $p-d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.53***	20.68***	5.06***	44.75**	10.69***	99.22***
	(0.86)	(9.61)	(1.70)	(17.60)	(3.19)	(28.41)
$All\ flow_t$	−0.72	−0.72	−3.10	−3.10*	−4.49**	−4.46**
	(1.21)	(1.24)	(1.94)	(1.89)	(2.28)	(2.00)
$(p-d)_t$		−4.64*		−10.15**		−22.63***
		(2.47)		(4.58)		(7.49)
R^2	0%	3%	2%	9%	2%	18%
	Active fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.53***	20.65**	5.07***	44.63**	10.69***	99.03***
	(0.87)	(9.61)	(1.70)	(17.60)	(3.19)	(28.35)
$Active\ flow_t$	−0.76	−0.75	−3.02	−2.98	−4.69**	−4.59**
	(1.24)	(1.27)	(1.91)	(1.90)	(2.26)	(2.02)
$(p-d)_t$		−4.63*		−10.11**		−22.58***
		(2.47)		(4.58)		(7.48)
R^2	0%	3%	2%	9%	2%	18%

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Table 8—*Continued*

	Index fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.56***	20.70**	5.11***	45.98***	10.90***	99.61***
	(0.87)	(9.41)	(1.70)	(17.49)	(3.19)	(28.73)
$Index\ flow_t$	0.11	0.00	−0.68	−0.91	0.39	−0.13
	(0.40)	(0.39)	(0.76)	(0.65)	(1.12)	(0.90)
$(p-d)_t$		−4.64*		−10.45**		−22.68***
		(2.42)		(4.54)		(7.56)
R^2	0%	3%	0%	8%	0%	16%
	Active and index fund flows					
	$R^M_{t+1,t+3}$		$R^M_{t+1,t+6}$		$R^M_{t+1,t+12}$	
Constant	2.54***	20.46**	5.06***	45.23**	10.76***	98.10***
	(0.87)	(9.48)	(1.72)	(17.63)	(3.19)	(28.37)
$Active\ flow_t$	−0.96	−0.85	−2.87	−2.62	−5.70**	−5.15**
	(1.43)	(1.47)	(1.91)	(1.97)	(2.45)	(2.20)
$Index\ flow_t$	0.26	0.14	−0.20	−0.47	1.33	0.75
	(0.48)	(0.49)	(0.73)	(0.68)	(1.13)	(0.93)
$(p-d)_t$		−4.58*		−10.27**		−22.33***
		(2.45)		(4.59)		(7.50)
R^2	0%	3%	2%	9%	3%	18%
N (all panels)	274	274	271	271	265	265

Table 9: **Predicting active-minus-market returns with fund flows, no institutional funds**

Regressions of future active fund returns in excess of the market on current flows, excluding share classes marked as institutional. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. $R^A - R^M$ is the return on a strategy long the value-weighted active fund portfolio and short the market over a 3, 6, and 12-month horizon. $p - d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.23	−1.28	−0.48	−2.62	−1.11	−8.19
	(0.18)	(2.32)	(0.36)	(4.52)	(0.74)	(7.86)
All flow$_t$	0.47**	0.47***	0.77**	0.77**	0.71	0.71
	(0.19)	(0.18)	(0.33)	(0.32)	(0.57)	(0.54)
$(p-d)_t$		0.27		0.55		1.81
		(0.59)		(1.16)		(2.00)
R^2	3%	3%	3%	4%	1%	3%
	Active fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.23	−1.26	−0.48	−2.59	−1.11	−8.17
	(0.18)	(2.31)	(0.36)	(4.51)	(0.74)	(7.85)
Active flow$_t$	0.48**	0.48**	0.77**	0.77**	0.71	0.70
	(0.19)	(0.18)	(0.33)	(0.32)	(0.59)	(0.56)
$(p-d)_t$		0.26		0.54		1.80
		(0.59)		(1.15)		(2.00)
R^2	3%	3%	3%	4%	1%	3%

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Table 9—*Continued*

	Index fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.25	−1.34	−0.50	−2.74	−1.14	−8.23
	(0.18)	(2.42)	(0.37)	(4.72)	(0.75)	(8.09)
$Index\ flow_t$	0.03	0.03	0.06	0.08	−0.05	−0.01
	(0.10)	(0.10)	(0.19)	(0.18)	(0.27)	(0.28)
$(p-d)_t$		0.28		0.57		1.81
		(0.62)		(1.20)		(2.06)
R^2	0%	0%	0%	1%	0%	2%
	Active and index fund flows					
	$(R^A - R^M)_{t+1,t+3}$		$(R^A - R^M)_{t+1,t+6}$		$(R^A - R^M)_{t+1,t+12}$	
Constant	−0.24	−1.19	−0.49	−2.51	−1.12	−7.99
	(0.17)	(2.26)	(0.36)	(4.46)	(0.73)	(7.83)
$Active\ flow_t$	0.53**	0.52**	0.83**	0.82**	0.85	0.81
	(0.22)	(0.21)	(0.40)	(0.39)	(0.70)	(0.68)
$Index\ flow_t$	−0.06	−0.05	−0.07	−0.06	−0.19	−0.14
	(0.11)	(0.10)	(0.20)	(0.20)	(0.31)	(0.33)
$(p-d)_t$		0.24		0.52		1.76
		(0.58)		(1.14)		(2.00)
R^2	3%	4%	3%	4%	1%	3%
N (all panels)	274	274	271	271	265	265

Table 10: **Predicting market returns with fund flows, conditioning on the past market return**

Regressions of future market returns on current flows, while also conditioning on the market return in the past year. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. R^M is the return on the market portfolio from CRSP over a 3, 6, and 12-month horizon. $p - d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
Constant	2.49*	4.94**	10.05**
	(1.28)	(2.48)	(4.28)
$All\ flow_t$	−0.72	−3.13	−5.18*
	(1.46)	(2.40)	(2.65)
$R^M_{t-12,t}$	0.01	0.02	0.06
	(0.05)	(0.10)	(0.17)
$(All\ flow)_t \times R^M_{t-12,t}$	−0.04	−0.07	0.02
	(0.08)	(0.09)	(0.11)
R^2	1%	3%	2%

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Table 10—*Continued*

	Active fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
$Constant$	2.50*	4.95**	10.04**
	(1.28)	(2.49)	(4.28)
$Active\ flow_t$	−0.74	−3.05	−5.29**
	(1.47)	(2.33)	(2.60)
$R^M_{t-12,t}$	0.01	0.02	0.06
	(0.05)	(0.10)	(0.17)
$(Active\ flow)_t \times R^M_{t-12,t}$	−0.04	0.00	0.02
	(0.07)	(0.08)	(0.11)
R^2	1%	3%	3%
	Index fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
$Constant$	2.55**	5.07**	10.52**
	(1.29)	(2.42)	(4.15)
$Index\ flow_t$	−0.10	−0.78	−0.63
	(0.42)	(1.06)	(1.26)
$R^M_{t-12,t}$	0.06	0.00	0.04
	(0.05)	(0.06)	(0.08)
$(Index\ flow)_t \times R^M_{t-12,t}$	0.00	0.02	0.05
	(0.11)	(0.03)	(0.08)
R^2	0%	1%	0%
N (all panels)	274	271	265

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Table 10—*Continued*

	Index and active fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
$Constant$	2.56**	4.95**	10.11**
	(1.27)	(2.50)	(4.22)
$Active\ flow_t$	−0.83	−2.90	−5.93**
	(1.64)	(2.18)	(2.69)
$Index\ flow_t$	0.04	−0.19	0.68
	(0.53)	(0.93)	(1.29)
$R^M_{t-12,t}$	0.01	0.02	0.07
	(0.05)	(0.11)	(0.17)
$(Active\ flow)_t \times R^M_{t-12,t}$	−0.07	−0.07	−0.03
	(0.07)	(0.07)	(0.11)
$(Index\ flow)_t \times R^M_{t-12,t}$	0.03	0.00	0.04
	(0.04)	(0.06)	(0.08)
R^2	1%	3%	3%
N (all panels)	274	271	265

Table 11: **Predicting active-minus-market returns with fund flows, conditioning on the past market return**

Regressions of future active fund returns in excess of the market on current flows, while also conditioning on the market return in the past year. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. equity mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. $R^A - R^M$ is the return on a strategy long the value-weighted active fund portfolio and short the market over a 3, 6, and 12-month horizon. $p-d$ is the 12-month trailing market price-dividend ratio. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
Constant	-0.11	-0.21	-0.48
	(0.17)	(0.33)	(0.61)
$All\ flow_t$	0.61***	0.98***	1.13*
	(0.18)	(0.33)	(0.60)
$R^M_{t-12,t}$	-0.01	-0.03	-0.06**
	(0.01)	(0.02)	(0.03)
$(All\ flow)_t \times R^M_{t-12,t}$	0.00	0.00	0.01
	(0.01)	(0.02)	(0.04)
R^2	1%	7%	8%

(Continued on next page)

Table 11—*Continued*

	Active fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
$Constant$	-0.11	-0.21	-0.48
	(0.17)	(0.33)	(0.61)
$Active\ flow_t$	0.60***	0.96***	1.11*
	(0.19)	(0.34)	(0.61)
$R^M_{t-12,t}$	-0.01	-0.03	-0.06**
	(0.01)	(0.02)	(0.03)
$(Active\ flow)_t \times R^M_{t-12,t}$	0.00	0.01	0.02
	(0.01)	(0.02)	(0.04)
R^2	5%	7%	8%
	Index fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
$Constant$	-0.17	-0.30	-0.58
	(0.19)	(0.34)	(0.63)
$Index\ flow_t$	0.19**	0.37***	0.25
	(0.09)	(0.13)	(0.17)
$R^M_{t-12,t}$	-0.01	-0.02	-0.05**
	(0.01)	(0.02)	(0.02)
$(Index\ flow)_t \times R^M_{t-12,t}$	-0.01	-0.03*	-0.02
	(0.01)	(0.01)	(0.02)
R^2	3%	6%	6%

(Continued on next page)

Table 11—*Continued*

	Index and active fund flows		
	$R^M_{t+1,t+3}$	$R^M_{t+1,t+6}$	$R^M_{t+1,t+12}$
Constant	-0.13	-0.27	-0.54
	(0.17)	(0.31)	(0.60)
$Active\ flow_t$	0.57**	0.84**	1.14
	(0.22)	(0.39)	(0.72)
$Index\ flow_t$	0.07	0.20	0.01
	(0.12)	(0.19)	(0.27)
$R^M_{t-12,t}$	-0.01	-0.03	-0.06**
	(0.01)	(0.02)	(0.03)
$(Active\ flow)_t \times R^M_{t-12,t}$	0.01	0.03	0.04
	(0.01)	(0.02)	(0.04)
$(Index\ flow)_t \times R^M_{t-12,t}$	-0.01	-0.03*	-0.03
	(0.01)	(0.02)	(0.60)
R^2	6%	10%	10%

Table 12: **Flows as a risk factor, conditioning on the past market return**

Pricing of the aggregate fund flows risk factor FLO. FLO is constructed from the returns of 25 double-sorted portfolios. Each stock in CRSP is assigned full-sample univariate betas with respect to the market return and the time series of aggregate fund flows (net of a 12-month moving average). Each month, stocks are sorted into value-weighted portfolios based on the quintile of their market and flow betas. FLO is a portfolio that is long the five high-flow beta quintiles and short the five low-flow beta quintile portfolios (ensuring that FLO has a low market beta). Results from time series regressions of FLO on the other factors. All returns are in percent per month (e.g. -0.83 is minus eighty-three basis points per month). Data is monthly from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

$Constant$	-1.24^{**}	-1.30^{***}	-1.59^{***}	-1.71^{***}
	(0.50)	(0.50)	(0.42)	(0.42)
$R^M_{t-12,t}$	0.04^{*}	0.04	0.05^{***}	0.07^{***}
	(0.02)	(0.02)	(0.02)	(0.02)
$MKT - R_f$		0.16^{*}	-0.05	-0.24^{**}
		(0.10)	(0.09)	(0.10)
$(MKT - R_f) \times R^M_{t-12,t}$		0.00	0.00	0.01
		(0.01)	(0.01)	(0.01)
SMB			1.16^{***}	1.07^{***}
			(0.14)	(0.14)
$SMB \times R^M_{t-12,t}$			0.00	0.00
			(0.01)	(0.01)
HML			-0.35^{***}	-0.34^{***}
			(0.13)	(0.12)
$HML \times R^M_{t-12,t}$			0.02^{***}	0.02^{**}
			(0.01)	(0.01)
MOM				-0.26^{***}
				(0.09)
$MOM \times R^M_{t-12,t}$				0.01^{**}
				(0.00)
R^2	1%	2%	33%	37%
N	276	276	276	276

Table 13: **Asset pricing with flows, conditioning on the past market return**

Results from an asset pricing test using the aggregate fund flows risk factor FLO. FLO is constructed from the returns of 25 value-weighted portfolios, double-sorted according to their univariate betas with respect to the market and aggregate fund flows. FLO is a portfolio that is long the five high-flow beta quintiles and short the five low-flow beta quintile portfolios. The table presents alphas and betas from time series regressions of the return on an active minus index long-short portfolio strategy $R^A - R^I$ on FLO and standard risk factors. All returns are in percent per month (e.g. -0.07 is minus seven basis points per month). Data is monthly from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	$R^A - R^I$		$R^A - R^I$		$R^A - R^I$	
Alpha	-0.03	0.09	-0.07	-0.01	-0.11*	-0.04
	(0.09)	(0.08)	(0.06)	(0.06)	(0.06)	(0.06)
$R^M_{t-12,t}$	-0.25	-0.67*	-0.04	-0.21	-0.23	-0.49
	(0.44)	(0.38)	(0.31)	(0.31)	(0.15)	(0.31)
FLO		0.09***		0.03***		0.04***
		(0.01)		(0.01)		(0.01)
$FLO \times R^M_{t-12,t} \times 100$		0.13***		-0.04		-0.04
		(0.04)		(0.04)		(0.04)
$MKT - R_f$	0.04**	0.02	-0.01	-0.01	0.00	0.00
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
$(MKT - R_f) \times R^M_{t-12,t} \times 100$	-0.10	-0.08	-0.13**	-0.12**	-0.22***	-0.26***
	(0.08)	(0.07)	(0.06)	(0.06)	(0.07)	(0.07)

(Continued on next page)

Table 13—*Continued*

SMB			0.25***	0.22***	0.24***	0.21***
			(0.02)	(0.02)	(0.02)	(0.02)
$SMB \times R^M_{t-12,t} \times 100$			0.21**	0.27**	0.18*	0.21**
			(0.10)	(0.11)	(0.10)	(0.10)
HML			-0.01	0.00	-0.01	0.00
			(0.02)	(0.02)	(0.02)	(0.02)
$HML \times R^M_{t-12,t} \times 100$			-0.02	-0.10	0.10	0.00
			(0.08)	(0.09)	(0.09)	(0.09)
MOM					0.05***	0.06***
					(0.01)	(0.01)
$MOM \times R^M_{t-12,t} \times 100$					0.12**	0.08
					(0.06)	(0.05)
R^2	2%	30%	54%	57%	57%	60%
N	276	276	276	276	276	276

Table 14: **Summary statistics, bond funds**

Means, standard deviations, autocorrelations and observation counts for key variables. Using fund-level data on net cash flows and returns, I aggregate all funds in a given category into a single value-weighted fund. "All" is comprised of all U.S. corporate bond mutual funds. "Active" and "Index" are for the subsets of active and index funds, respectively. "Flow" is the ratio of net cash-flows (sales minus redemptions) over last month's total assets, expressed in percent (so 0.03 is three basis points per month). To remove time trends, I subtract a twelve-month moving average from each month's flow. Returns are in percent per month. Monthly data from Morningstar, January 1990 to January 2013.

		Mean	St. Dev.	Autocorr.	N
Flows	All	0.03	1.09	0.34	264
	Active	0.03	1.10	0.33	264
	Index	−0.14	1.64	0.25	253
Returns	All	0.55	1.16	0.28	276
	Active	0.55	1.20	0.29	276
	Index	0.55	1.06	0.12	274

Table 15: **Mutual fund performance, bond funds**

This table compares the after-fee performance of active and index taxable bond mutual funds. "All" is the return on a value-weighted portfolio of all U.S. corporate bond mutual funds. "Active" is for active funds and "Index" is for index funds. The alphas are in percent per month (e.g. 0.20 is twenty basis points per month). "Mkt-Rf" is the excess equity market return, "Agg. Bond" is the excess return on the Barclays Corporate Bond Market Index; "Hi Yield" is the return on a portfolio long the Barclays High Yield Index and short the Corporate Bond Market Index; "Term" is the return on a portfolio long the Barclays Long Maturity Corporate Bond Index and short the Corporate Bond Market Index; "Treasury" is the return on a portfolio long the Barclays Treasury Index and short the Corporate Bond Market Index. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels, respectively.

	All			Active			Index		
α	0.20***	0.03	−0.03*	0.19***	0.03	−0.03*	0.27***	0.08***	0.01
	(0.06)	(0.03)	(0.02)	(0.06)	(0.03)	(0.02)	(0.06)	(0.03)	(0.01)
$Mkt - R_f$	0.14***	0.08***	0.03***	0.15***	0.10***	0.03***	0.02	−0.05***	0.00
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)
Agg. Bond		0.57***	0.81***		0.57***	0.81***		0.63***	0.84***
		(0.02)	(0.02)		(0.02)	(0.02)		(0.02)	(0.01)
Hi Yield			0.26***			0.27***			0.02***
			(0.01)			(0.01)			(0.01)
Term			−0.13***			−0.15***			−0.04***
			(0.02)			(0.02)			(0.01)
Treasury			0.24***			0.20***			0.53***
			(0.02)			(0.02)			(0.01)
R^2	29%	82%	95%	31%	81%	95%	1%	81%	98%
N	276	276	276	276	276	276	274	274	274

Table 16: **Fund flows and contemporaneous returns, bond funds**

This table shows the correlation between bond fund flows and contemporaneous bond market returns. Flows are measured as net cash flows over lagged assets, net of a 12-month moving average. "All flow" are the percentage flows of a value-weighted portfolio of all U.S. corporate bond mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of all active funds and index funds, respectively. R^B is the return on the Barclays Corporate Bond Market Index in the same month as the fund flows. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	R_t^M	R_t^B	R_t^M	R_t^M
Constant	0.60***	0.60***	0.61***	0.61***
	(0.08)	(0.08)	(0.10)	(0.08)
$All\ flow_t$	0.55***			
	(0.11)			
$Active\ flow_t$		0.54***		0.51***
		(0.11)		(0.11)
$Index\ flow_t$			0.18*	0.06
			(0.09)	(0.07)
R^2	15%	14%	3%	14%
N	264	264	253	253

Table 17: **Predicting market returns with fund flows, bond funds**

Regressions of future bond market returns on current bond fund flows. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. corporate bond mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of active and index funds, respectively. R^B is the return on the Barclays Corporate Bond Market Index over a 3, 6, and 12-month horizon. "Yield" is the yield of the Barclays Corporate Bond Market Index. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$R^B_{t+1,t+3}$		$R^B_{t+1,t+6}$		$R^B_{t+1,t+12}$	
Constant	1.86***	−0.86	3.76***	−2.06	7.55***	−6.04
	(0.29)	(1.14)	(0.57)	(2.34)	(1.08)	(4.74)
$(All\ flow)_t$	0.19	0.18	0.46	0.41	0.24	0.10
	(0.22)	(0.23)	(0.32)	(0.33)	(0.56)	(0.47)
$Yield_t$		0.44**		0.94***		2.17***
		(0.18)		(0.36)		(0.70)
R^2	1%	5%	1%	11%	0%	21%
	Active fund flows					
	$R^B_{t+1,t+3}$		$R^B_{t+1,t+6}$		$R^B_{t+1,t+12}$	
Constant	1.86***	−0.86	3.76***	−2.05	7.55***	−6.02
	(0.29)	(1.14)	(0.57)	(2.34)	(1.08)	(4.75)
$(Active\ flow)_t$	0.21	0.19	0.48	0.43	0.29	0.14
	(0.22)	(0.22)	(0.32)	(0.33)	(0.54)	(0.46)
$Yield_t$		0.44**		0.94***		2.17***
		(0.18)		(0.36)		(0.70)
R^2	1%	5%	2%	11%	0%	21%

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Table 17—*Continued*

	Index fund flows					
	$R^B_{t+1,t+3}$		$R^B_{t+1,t+6}$		$R^B_{t+1,t+12}$	
$Constant$	1.78***	−0.63	3.59***	−1.50	7.20***	−5.19
	(0.32)	(1.21)	(0.62)	(2.46)	(1.09)	(4.98)
$(Index\ flow)_t$	−0.13	−0.07	−0.36**	−0.24	−0.75***	−0.47*
	(0.10)	(0.11)	(0.17)	(0.18)	(0.28)	(0.24)
$Yield_t$		0.40**		0.84**		2.02**
		(0.20)		(0.40)		(0.77)
R^2	1%	4%	2%	9%	4%	19%
	Active and index fund flows					
	$R^B_{t+1,t+3}$		$R^B_{t+1,t+6}$		$R^B_{t+1,t+12}$	
$Constant$	1.78***	−0.65	3.59***	−1.52	7.20***	−5.16
	(0.31)	(1.22)	(0.59)	(2.52)	(1.08)	(5.07)
$(Active\ flow)_t$	0.20	0.22	0.61*	0.62	0.37	0.34
	(0.23)	(0.25)	(0.37)	(0.39)	(0.49)	(0.47)
$(Index\ flow)_t$	−0.17**	−0.12	−0.49***	−0.37**	−0.83***	−0.54***
	(0.08)	(0.09)	(0.15)	(0.15)	(0.24)	(0.20)
$Yield_t$		0.40**		0.84**		2.02**
		(0.20)		(0.41)		(0.79)
R^2	1%	4%	4%	11%	4%	20%
N (all panels)	250	250	247	247	241	241

Table 18: **Predicting active-minus-market returns with fund flows, bond funds**

Regressions of future active bond fund returns in excess of the bond market on current flows. Flows are net cash flows over lagged assets, net of a 12-month moving average. "All flow" is for a value-weighted portfolio of all U.S. corporate bond mutual funds. "Active flow" and "Index flow" are for value-weighted portfolios of the subsets of active and index funds, respectively. $R^A - R^B$ is the return on a strategy long the value-weighted active bond fund portfolio and short the Barclays Corporate Bond Market Index over a 3, 6, and 12-month horizon. "Yield" is the yield on the Barclays Corporate Bond Market Index. Newey-West standard errors with 12 lags. Monthly data from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	All fund flows					
	$\left(R^A - R^B\right)_{t+1,t+3}$		$\left(R^A - R^B\right)_{t+1,t+6}$		$\left(R^A - R^B\right)_{t+1,t+12}$	
Constant	−0.21	0.93	−0.43	1.32	−0.93*	2.30
	(0.15)	(0.68)	(0.27)	(1.20)	(0.50)	(2.31)
$(All\ flow)_t$	0.21*	0.22*	0.19	0.21	0.50*	0.53**
	(0.13)	(0.13)	(0.14)	(0.15)	(0.26)	(0.26)
$Yield_t$		−0.19		−0.28		−0.52
		(0.11)		(0.20)		(0.38)
R^2	2%	5%	1%	5%	4%	9%
	Active fund flows					
Constant	−0.21	0.93	−0.43	1.32	−0.93*	2.31
	(0.15)	(0.69)	(0.27)	(1.20)	(0.50)	(2.32)
$(Active\ flow)_t$	0.20*	0.21*	0.17	0.19	0.47*	0.51**
	(0.12)	(0.13)	(0.13)	(0.15)	(0.25)	(0.26)
$Yield_t$		−0.19		−0.28		−0.52
		(0.11)		(0.20)		(0.38)
R^2	2%	5%	1%	5%	3%	9%

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Table 18—*Continued*

	Index fund flows					
	$\left(R^A - R^B\right)_{t+1,t+3}$		$\left(R^A - R^B\right)_{t+1,t+6}$		$\left(R^A - R^B\right)_{t+1,t+12}$	
$Constant$	-0.23	1.30*	−0.49*	2.01	−1.00*	3.38
	(0.14)	(0.75)	(0.28)	(1.32)	(0.51)	(2.67)
$(Indexflow)_t$	0.10	0.06	0.16**	0.10	0.32**	0.22
	(0.07)	(0.07)	(0.08)	(0.08)	(0.15)	(0.16)
$Yield_t$		−0.25**		−0.41*		−0.71*
		(0.12)		(0.21)		(0.43)
R^2	1%	6%	2%	9%	3%	13%
	Active and index fund flows					
	$\left(R^A - R^B\right)_{t+1,t+3}$		$\left(R^A - R^B\right)_{t+1,t+6}$		$\left(R^A - R^B\right)_{t+1,t+12}$	
$Constant$	−0.23	1.29*	−0.49*	2.01	−0.99*	3.39
	(0.15)	(0.74)	(0.28)	(1.32)	(0.51)	(2.61)
$(Active\ flow)_t$	0.14	0.13	0.00	-0.01	0.25	0.26
	(0.12)	(0.12)	(0.10)	(0.11)	(0.22)	(0.21)
$(Index\ flow)_t$	0.07	0.03	0.16**	0.10	0.27**	0.17
	(0.05)	(0.05)	(0.07)	(0.08)	(0.12)	(0.14)
$Yield_t$		−0.25**		−0.41*		−0.72*
		(0.12)		(0.21)		(0.43)
R^2	2%	7%	2%	9%	4%	14%
N (all panels)	250	250	247	247	241	241

Table 19: **Aggregate flows as a risk factor, controlling for bond market factors**

Pricing of the aggregate fund flows risk factor FLO. Each stock in CRSP is assigned full-sample univariate betas with respect to the excess stock market return and the time series of aggregate equity fund flows (net of a 12-month moving average). Each month, stocks are sorted into value-weighted portfolios based on the quintile of their market and flow betas. The FLO factor is a portfolio long the five high flow-beta quintiles and short the five low flow-beta quintile portfolios. "Agg. Bond" is the excess return of the Barclays Corporate Bond Market Index; "Hi Yield" is the return on the Barclays High Yield Corporate Bond Index minus the Corporate Bond Market Index; "Term" is the return on the Barclays Long Maturity Corporate Bond Index minus the return on the Corporate Bond Market Index; "Treasury" is the return on a portfolio long the Barclays Treasury Index and short the Corporate Bond Market Index. All returns are in percent per month (e.g. −0.92 is minus ninety-two basis points per month). Data is monthly from January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	Panel A: Pairwise factor correlations with FLO			
	Agg. Bond	Hi Yield	Term	Treasury
FLO	0.01	0.40	−0.04	−0.32
	Panel B: Time series regressions of FLO			
	(1)	(2)	(3)	(4)
Constant	−0.92**	−0.89**	−1.04**	−0.88**
	(0.43)	(0.44)	(0.40)	(0.40)
MKT − R_f	0.16*	0.17*	−0.31***	−0.34***
	(0.10)	(0.10)	(0.11)	(0.11)
Agg. Bond		−0.10	0.45*	0.01
		(0.29)	(0.27)	(0.46)
Hi Yield			1.59***	1.11***
			(0.21)	(0.25)
Term				−0.64
				(0.56)
Treasury				−1.79
				(0.55)
R^2	1%	1%	19%	22%
N	276	276	276	276

Table 20: **Asset pricing with flows, bond funds**

Bond fund asset pricing test using the aggregate fund flows risk factor FLO. FLO is constructed from the returns of 25 value-weighted equity portfolios, double-sorted according to their univariate betas with respect to the stock market and aggregate equity fund flows. FLO is a portfolio that is long the five high-flow beta quintiles and short the five low-flow beta quintile portfolios. The table presents alphas and betas from time series regressions of the return on an active minus index long-short bond fund portfolio strategy $R^A - R^I$ on FLO and the bond market factors. All returns are in percent per month (e.g. -0.07 is minus seven basis points per month). Data is monthly from Morningstar, January 1990 to January 2013. Three, two and one stars denote significance at the 1%, 5%, and 10% levels.

	$R^A - R^I$		$R^A - R^I$		$R^A - R^I$	
Alpha	−0.07	−0.02	−0.05	0.00	−0.05**	−0.04**
	(0.05)	(0.04)	(0.05)	(0.04)	(0.02)	(0.02)
FLO		0.05***		0.05***		0.01*
		(0.01)		(0.01)		(0.00)
$Mkt - R_f$	0.14***	0.13***	0.14***	0.13***	0.03***	0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Agg. Bond			−0.06**	−0.06**	−0.03	−0.03*
			(0.03)	(0.03)	(0.02)	(0.02)
Hi Yield					0.25***	0.25***
					(0.01)	(0.01)
Term					−0.11***	−0.10***
					(0.03)	(0.03)
Treasury					−0.33***	−0.32***
					(0.03)	(0.03)
R^2	39%	52%	40%	52%	90%	90%
N	274	273	274	273	274	273