

Online Appendix for “Individual Investor Activity and Performance”

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Appendix Table 1: Mean and standard deviation of returns in the population and sample

	<u>A. All investors</u>				<u>B. Non-coordinated investors</u>				<u>C. Coordinated investors</u>			
	Population		Sample		Population		Sample		Population		Sample	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Default fund	1.75	15.59	1.75	15.59	1.75	15.59	1.75	15.59	—	—	—	—
No change	1.72	17.12	1.73	17.12	1.72	17.12	1.73	17.12	—	—	—	—
1 change	1.75	17.38	1.74	17.33	1.75	17.38	1.74	17.33	—	—	—	—
2– 5 changes	2.20	17.96	2.23	17.95	2.44	18.20	2.49	18.19	1.20	16.96	1.14	16.97
6–20 changes	2.27	17.22	2.28	17.28	4.03	18.58	4.09	18.71	1.05	16.29	1.06	16.32
21–50 changes	3.12	16.47	3.09	16.38	5.91	18.33	5.81	18.27	2.27	15.90	2.34	15.85
51– changes	6.96	17.05	7.01	17.03	8.57	18.22	8.62	18.29	5.51	15.99	5.63	15.95

The table presents the mean and standard deviation of the portfolio returns obtained by individuals in various investor categories. See the main text for the categories. The means and standard deviations are computed on daily returns of individuals' portfolios during the sample period and expressed in % per year. In Panel A all investors are considered; in Panel B only non-coordinated investors are considered; in Panel C only coordinated investors are considered. The algorithm for determining whether an individual has made coordinated fund changes, or not, is described in the text. All investors included have been in the sample over the entire period. The first two columns in each panel present statistics of investors in the population; the next two columns present the statistics of investors in the sample.

Appendix Table 2: Equal-weighted versus value-weighted returns

	A. Equal-weighted returns			B. Value-weighted returns		
	Alpha-3F (% per year)	Alpha-5F (% per year)	Alpha-6F (% per year)	Alpha-3F (% per year)	Alpha-5F (% per year)	Alpha-6F (% per year)
Default fund	-0.42 (2.21)	-0.56 (2.23)	-0.60 (2.24)	-0.42 (2.25)	-0.56 (2.26)	-0.61 (2.28)
No change	-0.83 (1.92)	-1.03 (1.87)	-1.06 (1.88)	-0.79 (1.87)	-1.12 (1.83)	-1.21 (1.85)
1 change	-0.71 (1.97)	-0.85 (1.92)	-0.87 (1.93)	-0.67 (1.96)	-0.87 (1.90)	-0.99 (1.92)
2–5 changes	0.13 (2.23)	-0.10 (2.37)	-0.31 (2.21)	0.36 (2.27)	0.06 (2.19)	-0.29 (2.21)
6–20 changes	1.85 (2.64)	1.65 (2.53)	1.02 (2.55)	2.22 (2.76)	1.99 (2.65)	1.20 (2.63)
21–50 changes	3.44 (2.91)	3.20 (2.78)	2.30 (2.73)	3.82 (3.08)	3.53 (2.95)	2.47 (2.89)
51– changes	6.29* (3.22)	5.93* (3.09)	5.06* (3.04)	6.70** (3.36)	6.30* (3.22)	5.33 (3.17)
<i>t</i> -test [<i>p</i> -value]	[<0.01]***	[<0.01]***	[0.01]**	[<0.01]***	[<0.01]***	[<0.01]***
<i>MR</i> -test [<i>p</i> -value]	[0.08]*	[0.06]*	[0.06]*	[0.09]*	[0.05]**	[0.05]**

The table presents the performance of non-coordinated individuals categorized according to the number of fund changes they have made. See Table I for the categories. The different columns present three different alpha measures for each category. Alpha-3F refers to the intercept in a three-factor performance model using the excess returns of the Swedish stock market, the Swedish bond market, and the world stock market as factors; Alpha-5F refers to the alpha in a five-factor model with world value/growth and size factors in addition to the factors in the three-factor model; Alpha-6F refers to the alpha in a six-factor model with a world momentum factor in addition to the factors in the five-factor model. See the text for details. The alpha figures in the first three columns (panel A) are based on equal-weighted returns. Columns 4 to 6 (panel B) are similar, except that they are based on value-weighted returns. Value-weighted returns are calculated by assuming that all investors have the same weight on the first day, but thereafter their weights depend on their cumulated returns (wealth on the pension account). The alphas are expressed in % per year. Standard errors, robust to conditional heteroscedasticity and serial correlation up to four lags as in Newey and West (1987), are reported in parentheses. The *t*-test refers to a test of equal means or alphas for the categories “no change” and “51– changes.” The *MR*-test refers to Patton and Timmermann’s (2010) test of a monotonous relationship over the number of fund changes (excluding the default fund). The *p*-values of these tests are reported in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix Table 3: Investor activity, performance, and interactions of characteristics

	Age	Gender	Income
Constant (no change)	-1.367 (2.173)	-1.391 (2.198)	-1.452 (2.207)
1 change	-0.069 (0.563)	0.109 (0.377)	0.257 (0.475)
2– 5 changes	0.703 (0.856)	0.574 (0.799)	0.811 (0.919)
6–20 changes	2.583 (1.625)	2.224* (1.481)	2.543* (1.779)
21–50 changes	3.254* (1.851)	4.052* (2.080)	4.465** (2.267)
51– changes	4.277 (2.789)	7.366*** (2.765)	7.134*** (2.747)
Age	0.005 (0.008)	0.007 (0.008)	0.007 (0.008)
Gender	0.276*** (0.099)	0.143*** (0.048)	0.273*** (0.098)
Income	-0.018 (0.025)	-0.019 (0.024)	-0.018 (0.020)
Characteristic × 1 change	0.005 (0.009)	0.180 (0.174)	-0.014 (0.038)
Characteristic × 2– 5 changes	0.005 (0.008)	0.709*** (0.273)	0.030 (0.040)
Characteristic × 6–20 changes	0.002 (0.015)	0.814*** (0.307)	0.028 (0.084)
Characteristic × 21–50 changes	0.018 (0.024)	0.274 (0.298)	-0.055 (0.095)
Characteristic × 51– changes	0.053* (0.031)	-0.481 (0.845)	-0.029 (0.177)
<i>R</i> -squared	0.553	0.553	0.553

The table presents the results of pooled regressions of non-coordinated investors individuals' daily excess returns on return factors, a measure of the number of fund changes by each investor, other individual characteristics and interaction terms between the characteristics and the measure of fund changes. The return factors are the excess returns of the Swedish stock market, the Swedish bond market, the world stock market, a world value/growth factor, and a world size factor (see the text for details). The coefficients on these factors are allowed to vary across the individuals' characteristics. For brevity, the coefficients on these return factors and results on default fund investors are not presented in the table. The number of fund changes is measured using a set of dummy variables; one for each activity category (see Table I). Other characteristics are the individuals' age in year 2000, gender (one if man, and otherwise zero) or pension rights in year 2000, which is a proxy for income. The constant term and coefficients on both the dummy variables and interaction terms are expressed in % per year. The income variable is scaled down by 1,000. Standard errors, robust to conditional heteroscedasticity and spatial autocorrelations with four lags as in Driscoll and Kraay (1998), are reported in parentheses. The sample consists of 62,640 individuals followed daily over the 2000 to 2010 period. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix Table 4: Investor activity and performance—alternative thresholds

	Mean (% per year)	Alpha-3F (% per year)	Alpha-5F (% per year)	Alpha-6F (% per year)
A. Threshold of 500 individuals				
No change	3.88 (5.46)	-0.25 (1.91)	-0.26 (1.84)	-0.52 (1.87)
Low number of changes	6.62 (5.09)	2.51 (2.48)	1.88 (2.39)	0.67 (2.32)
High number of changes	12.13** (4.93)	8.53** (3.55)	7.10** (3.42)	5.28* (2.21)
<i>t</i> test [<i>p</i> -value]	[0.01]**	[<0.01]***	[0.01]**	[0.03]**
<i>MR</i> test [<i>p</i> -value]	[0.02]**	[0.01]**	[0.03]*	[0.09]*
B. Threshold of 2,000 individuals				
No change	3.88 (5.46)	-0.25 (1.92)	-0.26 (1.85)	-0.53 (1.88)
Low number of changes	6.65 (5.07)	2.56 (2.50)	1.93 (2.41)	0.70 (2.29)
High number of changes	12.52** (4.91)	8.93** (3.53)	7.48** (3.40)	5.71* (3.19)
<i>t</i> -test [<i>p</i> -value]	[0.01]**	[<0.01]***	[<0.01]***	[0.02]**
<i>MR</i> -test [<i>p</i> -value]	[0.02]**	[<0.01]***	[0.02]**	[0.08]*

The table presents mean returns and alphas for non-coordinated individuals categorized according to the number of fund changes they made in the one-year period finishing ten days before the return measurement day. Panel A and B present results for investors classified as uncoordinated using a coordination threshold of 500 and 2,000 simultaneous changes, respectively. The category “No change” refers to individuals who made a fund choice but did not make a fund change during the sorting period. The category “Low number of changes” refers to individuals who made at least one change but were not in the top percentile of activity during the sorting period. The category “High number of changes” refers to individuals in the top percentile of activity in the period. Mean returns and alphas are computed on daily returns of non-coordinated investors’ portfolios during the 2001 to 2010 period, and expressed in % per year. Alpha refers to the intercept in a three-, five- and six-factor performance model as described in the text. Standard errors, robust to conditional heteroscedasticity and serial correlation up to four lags as in Newey and West (1987), are reported in parentheses. The *t*-test refers to a test of equal means or alphas for the categories “No change” and “High number of changes.” The *MR*-test refers to Patton and Timmermann’s (2010) test of a monotonous relationship over the number of fund changes. The *p*-values of these tests are reported in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix Table 5: Investor activity and performance—full sample

	Mean (% per year)	Alpha-3F (% per year)	Alpha-5F (% per year)	Alpha-6F (% per year)
No change	3.87 (5.52)	-0.23 (1.94)	-0.25 (1.90)	-0.53 (1.89)
Low number of changes	6.32 (4.82)	2.37 (2.30)	1.78 (2.20)	0.63 (2.09)
High number of changes	11.84*** (4.51)	8.30** (3.30)	7.02** (3.19)	5.52* (3.03)
<i>t</i> -test [<i>p</i> -value]	[0.02]**	[<0.01]***	[<0.01]***	[0.02]**
<i>MR</i> -test [<i>p</i> -value]	[0.03]**	[<0.01]***	[0.02]**	[0.08]*

The table presents mean returns and alphas for individuals categorized according to the number of fund changes they made in the one-year period finishing ten days before the return measurement day. The results are for all investors in the sample (coordinated, uncoordinated and those who stayed in the sample for less than the full period). The category “No change” refers to individuals who made a fund choice but did not make a fund change during the sorting period. The category “Low number of changes” refers to individuals who made at least one change but were not in the top percentile of activity during the sorting period. The category “High number of changes” refers to individuals in the top percentile of activity in the period. Mean returns and alphas are computed on daily returns of non-coordinated investors’ portfolios during the 2001 to 2010 period, and expressed in % per year. Alpha refers to the intercept in a three-, five- and six-factor performance model as described in the text. Standard errors, robust to conditional heteroscedasticity and serial correlation up to four lags as in Newey and West (1987), are reported in parentheses. The *t*-test refers to a test of equal means or alphas for the categories “No change” and “High number of changes.” The *MR*-test refers to Patton and Timmermann’s (2010) test of a monotonous relationship over the number of fund changes. The *p*-values of these tests are reported in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix Table 6: Investor activity and performance—coordinated investors

	Mean (% per year)	Standard deviation (% per year)	Alpha-3F (% per year)	Alpha-5F (% per year)	Alpha-6F (% per year)
Default fund	—	—	—	—	—
No change	—	—	—	—	—
1 change	—	—	—	—	—
2– 5 changes	1.78 (5.22)	15.04	-0.73 (2.20)	0.38 (2.12)	0.15 (2.15)
6–20 changes	2.01 (5.01)	12.04	-0.60 (2.22)	0.53 (2.12)	0.42 (2.10)
21–50 changes	2.90 (5.08)	14.05	0.40 (2.24)	1.24 (2.14)	1.05 (2.14)
51– changes	6.29 (4.88)	13.23	3.64 (2.93)	4.49 (2.83)	3.09 (2.97)
<i>t</i> -test [<i>p</i> -value]	[0.03]**		[0.03]**	[0.04]**	[0.04]**
<i>MR</i> -test [<i>p</i> -value]	[0.06]*		[0.08]*	[0.08]*	[0.05]**

The table presents the performance of individuals categorized according to the number of fund changes they have made. See the main text for the categories. The first two columns present the mean and standard deviation of returns obtained by individuals in each category. The remaining columns present three different alphas of the categories. Alpha-3F refers to the intercept in a three-factor performance model using the excess returns of the Swedish stock market, the Swedish bond market, and the world stock market as factors; Alpha-5F refers to the alpha in a five-factor model with world value/growth and size factors in addition to the factors in the three-factor model; Alpha-6F refers to the alpha in a six-factor model with momentum factor in addition to the factors in the five-factor model. See the text for details. The statistics are computed on daily returns of individuals' portfolios during the period part of the sample period they are classified as coordinated investors. The mean, standard deviation, and alphas are expressed in % per year. Standard errors, robust to conditional heteroscedasticity and serial correlation up to four lags as in Newey and West (1987), are reported in parentheses. The *t*-test refers to a test of equal means or alphas for the categories “no change” and “51– changes.” The *MR*-test refers to Patton and Timmermann's (2010) test of a monotonous relationship over the number of fund changes (excluding the default fund). The *p*-values of these tests are reported in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix Table 7: Investor activity and performance—all investors

	Mean (% per year)	Standard deviation (% per year)	Alpha-3F (% per year)	Alpha-5F (% per year)	Alpha-6F (% per year)
Default fund	1.75 (5.29)	15.59	-0.42 (2.21)	-0.56 (2.23)	-0.60 (2.24)
No change	1.73 (5.38)	17.12	-0.83 (1.92)	-1.03 (1.87)	-1.06 (1.88)
1 change	1.74 (5.42)	17.33	-0.71 (1.97)	-0.85 (1.92)	-0.87 (1.93)
2– 5 changes	2.23 (5.57)	17.95	-0.14 (2.27)	-0.33 (2.08)	-0.51 (2.05)
6–20 changes	2.28 (5.30)	17.28	0.00 (2.26)	0.00 (2.15)	-0.39 (2.14)
21–50 changes	3.09 (4.99)	16.38	0.87 (2.29)	0.75 (2.19)	0.34 (2.25)
51– changes	7.01 (4.97)	17.03	4.72 (2.98)	4.67 (2.88)	4.10 (2.88)
<i>t</i> -test [<i>p</i> -value]	[0.02]**		[0.01]**	[<0.01]***	[0.01]**
<i>MR</i> -test [<i>p</i> -value]	[0.09]		[0.06]*	[0.03]*	[0.05]*

The table presents the performance of individuals categorized according to the number of fund changes they have made. See the main text for the categories. The first two columns present the mean and standard deviation of returns obtained by individuals in each category. The remaining columns present three different alphas of the categories. Alpha-3F refers to the intercept in a three-factor performance model using the excess returns of the Swedish stock market, the Swedish bond market, and the world stock market as factors; Alpha-5F refers to the alpha in a five-factor model with world value/growth and size factors in addition the factors in the three-factor model; Alpha-6F refers to the alpha in a six-factor model with momentum factor in addition to the factors in the five-factor model. See the text for details. The statistics are computed on daily returns of individuals' portfolios during the sample period. The mean, standard deviation, and alphas are expressed in % per year. Standard errors, robust to conditional heteroscedasticity and serial correlation up to four lags as in Newey and West (1987), are reported in parentheses. The *t*-test refers to a test of equal means or alphas for the categories “no change” and “51– changes.” The *MR*-test refers to Patton and Timmermann's (2010) test of a monotonous relationship over the number of fund changes (excluding the default fund). The *p*-values of these tests are reported in square brackets. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

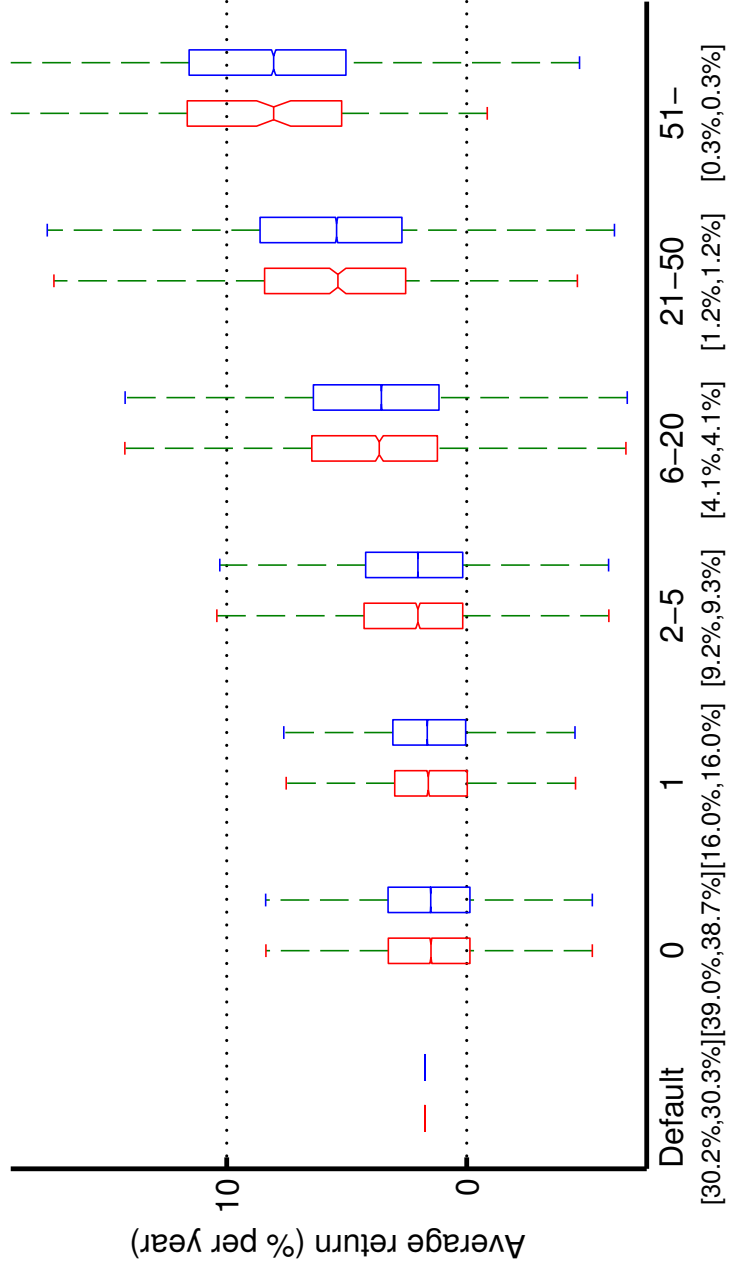
Appendix Table 8: Abnormal returns and coordinated flows, additional lags

	A-I	A-II	A-III	A-IV	A-V	A-VI
Outflow _t	-0.00082*** (0.00037)	-0.088** (0.035)	-0.094*** (0.035)	-0.083** (0.035)	-0.053** (0.024)	-0.040** (0.021)
Outflow _{t-1}	-0.00034 (0.00032)	0.011 (0.026)	0.011 (0.026)	0.027 (0.031)	0.008 (0.019)	0.004 (0.016)
Outflow _{t-2}	-0.00002 (0.00030)	-0.020 (0.028)	-0.024 (0.030)	-0.015 (0.032)	-0.000 (0.022)	0.001 (0.016)
Outflow _{t-3}	-0.00016 (0.00028)	-0.024 (0.027)	-0.003 (0.029)	-0.011 (0.032)	0.005 (0.025)	0.001 (0.018)
Inflow _t	0.00038 (0.00028)	0.046 (0.028)	0.013 (0.054)	-0.010 (0.069)	-0.000 (0.038)	0.025 (0.017)
Inflow _{t-1}	0.00034 (0.00025)	-0.002 (0.031)	-0.002 (0.074)	0.008 (0.107)	0.012 (0.053)	0.007 (0.016)
Inflow _{t-2}	0.00002 (0.00028)	-0.010 (0.025)	0.004 (0.046)	0.024 (0.055)	0.003 (0.030)	-0.023 (0.014)
Inflow _{t-3}	-0.00024 (0.00027)	-0.008 (0.026)	-0.006 (0.051)	-0.007 (0.073)	-0.014 (0.031)	-0.026** (0.014)
ar _{t-1}	-0.184*** (0.009)	-0.184*** (0.009)	-0.184*** (0.009)	-0.183*** (0.009)	-0.179*** (0.009)	-0.155*** (0.009)
ar _{t-2}	-0.082*** (0.014)	-0.082*** (0.014)	-0.082*** (0.014)	-0.082*** (0.014)	-0.079*** (0.014)	-0.070*** (0.014)
ar _{t-3}	-0.029*** (0.011)	-0.029*** (0.011)	-0.029*** (0.011)	-0.028*** (0.011)	-0.026** (0.011)	-0.023** (0.010)
R-squared	0.036	0.036	0.036	0.036	0.034	0.027

The table presents the results of panel regressions of a mutual fund's daily abnormal return on measures of flows. The abnormal return is obtained from the five-factor performance model discussed in the text. The abnormal return is defined as the sum of the intercept in the performance regression and the residual. The outflow measures correspond to those in Table X of the paper. All specifications include fund fixed effects but they are not tabulated. Standard errors, robust to conditional heteroscedasticity and spatial autocorrelations up to four lags as in Driscoll and Kraay (1998), are reported in parentheses. The sample includes all equity funds over the 2000 to 2010 period. Each specification includes a total of 1,213,414 observations. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

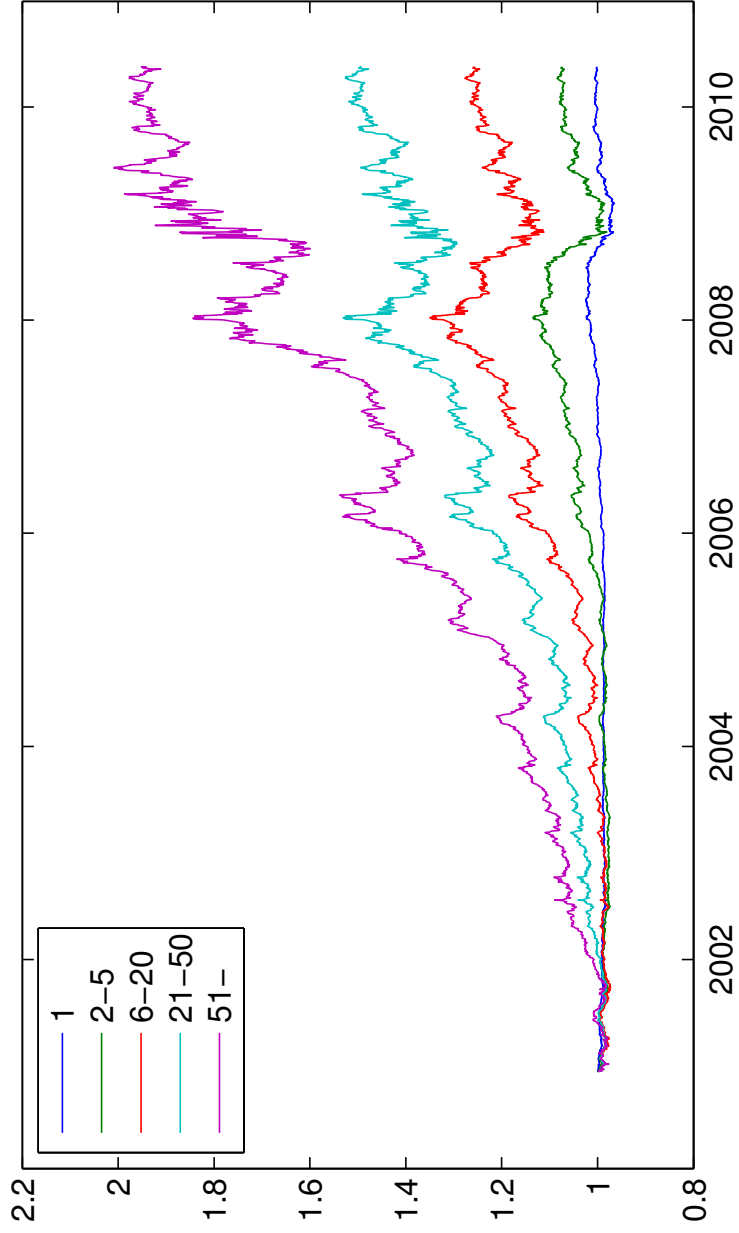
Appendix Figure 1: Average returns for sample and population

The figure depicts the median, interquartile range and 95% whiskers of average returns for various investor categories in our sample (red) and in our population (blue). The averages are computed on daily returns of non-coordinated investors during the 2000 to 2010 period, and are expressed in % per year. The categories capture how active investors have been in Sweden's Premium Pension System. The category "default fund" refers to individuals that have been in the default fund. The category "no change" refers to individuals who initially made a fund choice and have then never made a fund change. The remaining categories are of individuals who have made one or more fund changes. Below each category, the fraction of individuals in the category is reported in square brackets. All investors have been in the sample over the entire period.



Appendix Figure 2: Cumulative returns relative no change

The figure depicts the cumulated returns of individuals in various investor categories, relative to the cumulated returns for the category “no change.” (See Appendix Figure 1 for a description of the categories.) The returns are cumulated by multiplying daily gross returns. Each investor category is represented by an equal-weighted portfolio of all investors in the category.



Appendix Figure 3: Impulse response functions for outflows and abnormal returns

The figure depicts the effect of a shock to outflows on outflows and abnormal returns up to nine days after the shock. Figure a depicts the effect on the outflows (red, solid line); Figure b depicts the effect on abnormal returns (blue, dashed line). The dotted lines are 90% confidence bands around the point estimates, based on a bootstrap simulation that preserves the cross-sectional correlation and autocorrelation. The outflow shock is 11 times the average gross flow of the fund, which just triggers the dummy for outflow (see below). The abnormal return variable is expressed in %. The estimates are based on panel regressions of a mutual fund's daily abnormal return and flows. The return regression is similar to specification IV in Table X of the paper, except that we allow lag 0–2 of the dummies to affect the abnormal return, as well as lag 1–2 of the abnormal return itself (in this specification, no further lags are statistically significant). The dynamics of the flow variable is captured by a regression of the flow on 15 lags of flows and abnormal returns (no further lags are significant). The identifying assumption is thus that dummy variables based on the flows have a contemporaneous effect on abnormal returns, but that abnormal returns only affect flows with a one-day lag.

