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Journal Of Investment Management, Vol. 13, No. 3, (2015), pp. 80–92

BEWARE OF CHILDREN TRADING

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Guardians behind underaged accounts are successful at picking stocks. These informed traders tend to channel their best trades through the accounts of children, especially when they trade just before major earnings announcements, large price changes, and takeover announcements. Building on these results, we argue that the proportion of total trading activity through underaged accounts (labeled BABYPIN) is an effective proxy for firm-specific information asymmetry. Consistent with this claim, we show that investors demand a higher return for holding stocks with a higher probability of informed trading as proxied by BABYPIN.

The impact of information asymmetry on asset prices has received substantial attention in recent years. Easley and O'Hara (2004) develop a model in which investors require a higher return to hold stocks with a greater probability of private information. This higher return is necessary to compensate uninformed investors for the higher risk of losing to informed traders.[1]

Consistent with this theory, Easley *et al.* (2002) develop a measure for firm-specific information asymmetry, labeled "PIN," and find that stocks with a higher PIN generate a higher return. However, recent studies raise concerns about this empirical evidence. For example, Mohanram and Rajgopal (2009) conduct tests that cast doubt on whether PIN is really a priced risk factor. Duarte and Young (2009) present evidence suggesting that liquidity effects unrelated to information asymmetry explain the relation between the PIN measure and the cross section of expected returns.

In Berkman *et al.* (2014), we introduce a novel measure of stock-specific information asymmetry that is directly supported by empirical evidence. Our measure is the proportion of total trading activity in a stock that occurs through underaged accounts. We label this measure "BABYPIN." The strength of our measure is its empirical validation; we show that underaged accounts are exceptionally successful at stock picking,

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This invited article is a condensed version of our paper "Informed Trading through the Accounts of Children," published in the *Journal of Finance* (2014).

especially when they trade just before major earnings announcements, large absolute price changes, and takeover announcements. We also show that BABYPIN is negatively correlated with firm size, and positively correlated with PIN and the bid–ask spread. Finally, consistent with Easley and O'Hara (2004) and Lambert *et al.* (2011), we show that stocks with higher BABYPIN have higher future excess returns, on average.

Our study uses a unique dataset obtained from Euroclear Finland Ltd (Euroclear), covering the period 1995 through 2010. Euroclear records all changes in daily shareholdings for every investor trading on the Nasdaq OMX Helsinki exchange, as well as the age of the investor. We separately analyze the performance of trades made in underaged accounts (defined as accountholders aged 0–10 years) versus trades by accountholders in older age categories.[2] We also examine the performance of two sets of guardians, who are matched to underaged accounts by identifying accounts in Euroclear with similar trades and the same family surname, or similar trades in corporate sponsored accounts.

There are good reasons to expect that a relatively high proportion of underaged accounts is controlled by informed investors. First, underaged accounts might be used to camouflage illegal insider trading by guardians. While this might seem unlikely given the seemingly high probability of detection, there are a surprisingly large number of insider trading cases where insiders or their acquaintances trade through the accounts of spouses and children.[3] For example, consider the case of the Finnish CEO of Sampo in 1999. Sampo is a leading insurance company in Finland that was planning to acquire another Finnish insurance company, Pohjola. At the time of this planned takeover, the underaged daughter of the CEO of Sampo bought stocks in Pohjola and made a handsome profit at the announcement of the acquisition. The CEO was eventually convicted for illegal insider trading.

A second, more benign reason to expect a high proportion of informed trading through underaged accounts is that guardians who open accounts and trade on behalf of young children are likely to be above-average investors. We expect these individuals to be relatively wealthy, in order to be able to invest on their children's behalf. We also expect these individuals to be relatively successful at investing, possibly due to superior cognitive skills, or better access to networks that offer comparative advantages in obtaining value-relevant information. Assuming that guardians generally want to share the benefits of any information advantage with their offspring, we expect a high probability of informed trading through underaged accounts.

A Finland-based illustration of this second rationale is the case of Ms. Paula Lehtomaki, Finland's former Environmental Minister. In January 2010, her spouse and children bought shares in a mining company. In February 2010, this company announced the discovery of uranium deposits and its share price jumped. Lehtomaki was indicted, but not convicted, of illegal insider trading. She claimed that she "just thought this was a good investment." For the purposes of this article, it is noteworthy that Ms. Lehtomaki felt strongly enough about the prospects of this particular investment to acquire shares in the accounts of her spouse and children.

1 Data and sample characteristics

1.1 Data sources

Our sample includes the transactions of more than a half million individuals over the period January 1, 1995 through May 31, 2010. All transactions placed each day are recorded as either purchases

or sales. Trades are aggregated for every investor each day, and we use the daily net change in an investor's position of a given stock as our unit of observation.

We begin by splitting all individual investors into two groups: (i) underaged accountholders from age 0 to 10 years old and (ii) all older accountholders (>10 years old). Next we identify two subsets of guardians for the group of underaged accountholders, matched either by family name or by trades through corporate accounts. We have an identification number for each individual Finnish account that identifies the surname of the accountholder, without revealing the surname. Given this information, we obtain our first set of guardian accounts using four screens, where we require the underaged accountholder and the guardian to: (i) have the same surname, (ii) have the same postcode, (iii) have at least two trades in the same security on the same day with the same sign (buy/sell), and (iv) the guardian must be older than 25 years. Our second set of guardian accounts consists of corporate trading accounts that are linked to underaged accounts by the following three screens: (i) any Finnish-owned domestic private corporation, (ii) with the same postcode, and (iii) with at least five identical trades matched to an underaged account. This more stringent requirement for a match of five trades is likely to miss some corporate guardian accounts in exchange for ensuring that the accounts we identify are accurate matches.

1.2 Distribution of trading activity across young investors, older investors, and guardians

Table 1 provides the relative frequency of trading activity across the two age groups and guardians. The first column reports the total number of trading days across all stocks and accountholders in each group, whereas the second column gives the percentage of total trading days attributable to each group. Underaged accountholders make up less than 1% of the total number of stock trading days across all individual accounts in our sample. The third column shows that the youngest age group (0–10 years) comprises a total of 21,508 accounts, or roughly 3% of all 792,861 individual accounts in the sample. Intuitively, this evidence corresponds to our expectation that any attempt to identify a unique group of informed investors should represent a small proportion of all investors.

The bottom two rows of Table 1 summarize the trading behavior of the two sets of guardian accounts. We are able to match 2,708 adult accounts with underaged accounts in the youngest age group (0–10 years) based on family surname and at least two similar trades, and 330 corporate accounts based on at least five similar trades. These two sets of guardians are relatively active, trading as much as 2.8% and 2.6%, respectively, of the roughly 12 million total stock trading days by all individual investors in the sample. Finally, the median portfolio value of name-matched guardians is 25,742 euros, while the median value of corporate guardian accounts is more than 200,000 euros. Both of these values are significantly larger than the median portfolio value of 5,780 euros for all accountholders older than 11 years, and the median value of 6,619 euros for all other non-guardian adults who are at least 25 years old (p-values are less than 0.001 for both Wilcoxon tests).

2 Analysis of all trades

We analyze the relative investment skills of accountholders in the different groups of investors (i.e., young, old, and the two sets of guardian accounts). First, for each trading day (t) in the sample period and for each stock (i), we separate accounts that were net buyers from accounts that were net sellers of stock i, based on trades made x days earlier (i.e., on day $t - x$). This

Table 1 Sample characteristics of trading activity through: (i) Young accountholders, (ii) all older accountholders, and (iii) the accounts of guardians.

Group of accountholders	(1) # of Trades (n_i)	(2) % of Trades $(n_i/N) * 100$	(3) # of different accounts	(4) Median wealth (€)
Young accountholders (0–10 years)	95,215	0.8%	21,508	2,844
Older accountholders (>10 years)	11,777,607	99.2%	771,353	5,780
Total (N):	11,872,822	100.00%	792,861	
Guardians-family	333,988	2.8%	2,708	25,742
Guardians-corporate	305,748	2.6%	330	216,836

This table summarizes the relative frequency of trading activity through underaged accounts (aged 0–10 years) versus all older accountholders (>10 years). We also identify two subsets of guardians for the underaged accountholders, matched either by family name or by trades through corporate accounts. For details on the identification of guardian accounts, we refer to the text.

The first column reports the total number of trading days across all stocks and individual accountholders in every group. The second column gives the percent of total trading days attributable to every group. For every group, the last two columns give the number of accounts and the median wealth (i.e., account size in euros) on January 5, 2005. The total number of trades (N) in column (1) is obtained by summing over all accounts by registered accountholders in Finland.

procedure results in two cross sections for each trading day (t) which contain the purchases and sales, respectively, across all stocks made previously on day $t - x$. Second, we separate the buys or sells each day (t) into those made by every group of investors (i.e., young accountholders, older investors, and the two sets of guardian accounts). We then analyze the average return performance on day t for the stocks bought or sold x days earlier, by investors in every group, where $x = 1, 2, 3$, and 4 to 10 days earlier.

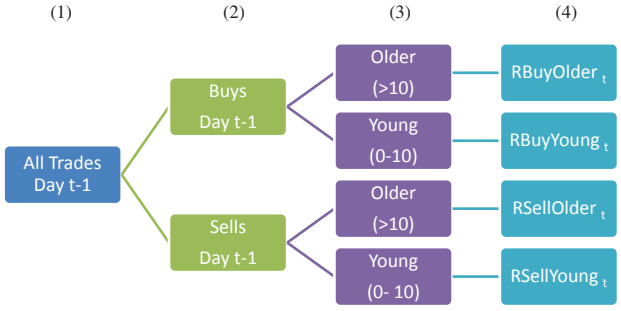

Figure 1 Experimental design for analysis of the performance of all trades made one day earlier by underaged versus older accountholders.

2.1 *Performance of young versus older investors for trades made one day earlier*

Figure 1 illustrates the basic design of our analysis, for trades made by young versus older investors one day earlier (i.e., $x = 1$ day). We compute mean returns for each set of buys or sells made by young or older investors, as well as the difference in mean returns across the two groups of investors. The resulting mean returns reveal the average one-day performance of all purchases or sales made one day earlier by each group of

investors (i.e., young or older). We also extend this technique to analyze trades by the two groups of guardian accounts, and for trades made prior to one day earlier.

Here we summarize the relevant results of this analysis. In Figure 2 we present the mean return based on trades made by young accountholders and older investors one day earlier (i.e., $x = 1$). Three sets of mean returns are plotted in this figure. First, consider the two bars on the left side of Figure 2. These bars represent the mean return on day t, based on purchases or sales made by older investors on day $t - 1$. The blue bar on the left shows that the mean one-day return for purchases by older investors is 0.011%, or 1.1 basis points. Likewise, the red bar on the left shows that the mean return for sales by older investors is −0.007%, or −0.7 basis points (bp). Both of these one-day mean returns are not significantly different from zero.

Second, consider the two bars in the middle of Figure 2. These bars represent the mean return on day t, based on purchases or sales made by young accountholders on day $t - 1$. The middle blue bar shows that the mean one-day return for purchases by young accountholders is 0.068%, or 6.8 bp, while the red bar indicates that the analogous mean return for sales is −0.065%, or −6.5 bp. Both of these mean returns are significantly different from zero at the 5% significance level.

Third, consider the bars on the right side of Figure 2. The blue (or red) bar on the right represents the difference across the mean one-day returns for purchases (or sales) by young versus older investors. The blue bar reveals that the mean one-day return across all purchases by

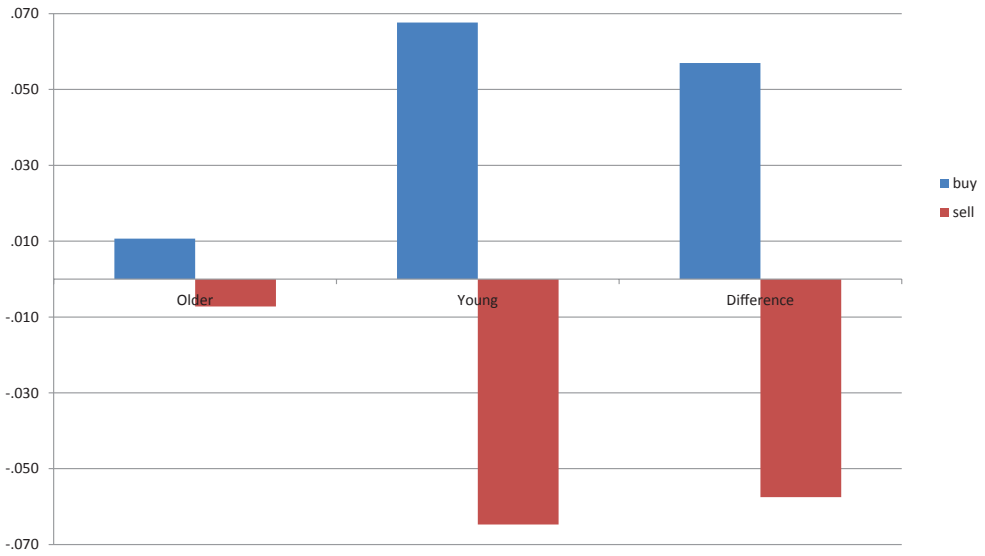

Figure 2 Mean one-day returns for trades made one day earlier by young or older investors.

This figure presents the mean return based on trades made by young accountholders and older investors one day earlier. The two bars on the left side represent the mean return on day t, based on purchases or sales made by **older** investors on day $t-1$. The two bars in the middle represent the mean return on day t, based on purchases or sales made by **young** accountholders on day $t - 1$. The bars on the right side represent the difference across the mean one-day returns for purchases (or sales) by **young** versus **older** investors. The mean returns are presented in percentage terms.

young accountholders is 5.7 bp greater than that by older investors (t-ratio = 3.2). The red bar on the right similarly shows that the mean one-day return for sales by young investors is 5.7 bp smaller (i.e., more negative) than that by older investors (t-ratio = 1.9). These results indicate that young accountholders significantly outperform older investors on both the buy side and the sell side, when we consider trades made one day earlier.

Finally, we generate a hypothetical hedge portfolio each day that goes long the stocks purchased by young accountholders and short the stocks sold by young investors. The evidence in Figure 2 indicates that this hedge portfolio would generate average gross returns of 13.2 (= +6.8−(−6.5)) bp per day, or roughly 32% per annum.[4] Together, the evidence in Figure 2 establishes that young accountholders display superior performance relative to older investors, over a very short one-day horizon.[5]

2.2 *Performance of young versus older investors for trades made prior to one day earlier*

In Figure 3 we present the analogous mean returns based on trades made by young versus older investors two days earlier (i.e., $x = 2$). The two bars on the left side of Figure 3 show that the mean one-day return for such purchases or sales by older investors is small in magnitude and insignificant. The bars on the right reveal that the mean one-day return for such purchases or sales by young accountholders generate mean returns two days later that are significantly greater than the analogous trades by older investors. The bars in the middle indicate that the hypothetical hedge portfolio that goes long stocks purchased

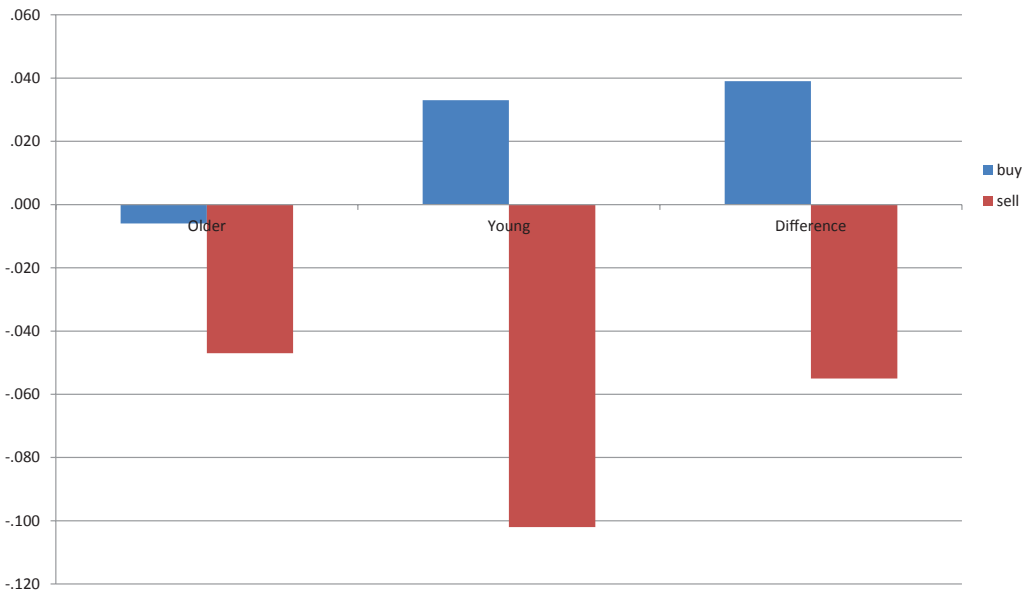

Figure 3 Mean one-day returns for trades made two days earlier by young or older investors.
This figure presents the mean return based on trades made by young accountholders and older investors two days earlier. The two bars on the left side represent the mean return on day t, based on purchases or sales made by **older** investors on day $t - 2$. The two bars in the middle represent the mean return on day t, based on purchases or sales made by **young** accountholders on day $t-2$. The bars on the right side represent the difference across the mean one-day returns for purchases (or sales) by **young** versus **older** investors. The mean returns are presented in percentage terms.

by young accountholders and short stocks sold by young investors on day $t-2$ generates a mean return two days later, that is 13.5(= $+3.3-(-10.2)$) bp. We have also computed the mean one-day return on this long–short hedge portfolio based on earlier trades by young accountholders, either on day $t-3$, or over days $t-4$ through $t-10$, with the following results: 10.9 bp and 4.3 bp per day, respectively. These average one-day hedge portfolio returns are significantly different from zero at the 5% level, and they diminish in magnitude for earlier trades.

Together, this evidence documents that young accountholders display exceptional short-term performance, which diminishes somewhat in magnitude over the two weeks following their trades.

2.3 Performance of guardians

In Berkman *et al.* (2014) we show that the guardians of underaged accountholders significantly outperform non-guardian adult investors on the buy side when they trade for their own account. However, unlike underaged accounts, guardians do not outperform older investors on the sell side. As a result, when we consider the mean hedge portfolio returns, underaged accounts outperform other non-guardian adults by a greater margin than guardian accounts. This evidence suggests that guardians are more likely to make uninformed liquidity trades on the sell side through their own accounts than they are through the accounts of children.

Overall, our results indicate that underaged accountholders and their guardians possess significant short-term informational advantages that result in superior average stock returns on the days immediately following their trades. This result motivates our next set of tests, where we examine the performance of underaged investors and their guardians around large price changes and major corporate events that are commonly associated with increased information asymmetry, such as takeover and earnings announcements.

3 Trades before major announcements and large price changes

We use an event study approach to focus on the performance of trades made in the days prior to takeover and earnings announcements. In addition, we analyze trades just before large price changes, which presumably reflect the arrival of substantive value-relevant information. For each group of investors, we examine the mean market-adjusted cumulative abnormal return on the day of and the day after each type of event ($CAR(0, +1)$).[6] For each stock-trading day by every accountholder, the $CAR(0, +1)$ is "signed" depending on whether that account was a net buyer or seller x days before the event (i.e., for $x = 1$, 2, or 3). If an account was a net buyer (or seller), the $CAR(0, +1)$ is multiplied by $+1$ (or -1).

Note that in our event studies of earnings announcements and large price changes we select the sample of events in such a way that, under the null hypothesis that all traders are uninformed, the expected $CAR(0,+1)$ equals zero. We do this by creating a matched sample with an equal number of good news and bad news events that are similar in terms of the distribution of the absolute $CAR(0,+1)$. By designing such a "fair experiment," we attempt to neutralize any potential biases that may arise from the tendency for underaged accountholders to buy more frequently than older accountholders.[7]

3.1 Event study results for earnings announcements and large price changes

Table 2 presents the mean $CAR(0, +1)$ for major earnings announcements and large price changes that pertain to trades made by young versus older

Table 2 Performance of young versus older accountholders before major earnings announcements and large price changes.

	Panel A. Trades during the three days before major earnings announcements								
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	Trades on day-1			Trades on day-2			Trades on day-3		
	Young	Older	Diff.	Young	Older	Diff.	Young	Older	Diff.
n	252	1,474		237	1,472		220	1,472	
CAR(0, +1)%	1.36	0.25	1.10	0.89	0.00	0.88	1.43	−0.11	1.54
(*p*-value)*	**0.04***	**0.04***	**0.01***	0.23	0.99	**0.04***	**0.05***	0.36	**0.01***
	Panel B. Trades during the three days before large price changes								
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	Trades on day-1			Trades on day-2			Trades on day-3		
	Young	Older	Diff.	Young	Older	Diff.	Young	Older	Diff.
n	192	1,446		168	1,465		167	1,451	
CAR(0, +1)%	2.00	−0.09	2.09	−0.51	0.36	−0.87	1.46	0.28	1.18
(*p*-value)*	**0.03***	0.67	**0.00***	0.64	0.21	0.21	0.16	0.14	**0.08***

This table presents the mean CAR on the day of, and the day after, major earnings announcements and large price changes (*CAR*(0, +1)) that pertains to trades made by young versus older accountholders in the three days ahead of the event. For each stock-trading day by every accountholder, the CAR is "signed" depending on whether that account was a net buyer or seller × days before the event. *p*-Values highlighted with * indicate significance at the 0.10 level or better.

investors in the three days ahead of the event.[8] Panel A of Table 2 provides results for trades made in each of the three days before major earnings announcements. Each set of results includes three columns. The first column summarizes the average performance of young investors across the subset of all announcements in our sample where at least one young accountholder trades on day $t - x$, where day t indicates the day of the earnings announcement or large price change. The second column documents the mean performance of older investors across the larger sample of events where at least one older accountholder trades on day $t - x$. The third column reports the difference in this mean performance across the two age groups.

The first column in Panel A of Table 2 shows that at least one young investor trades on day $t - 1$ for 252 of the 1,492 major earnings announcements in the sample. For these events, young traders have a significant mean signed *CAR*(0, +1) of 1.36% (*p*-value = 0.04). The second column in Panel A of Table 2 presents the analogous results for older accountholders who trade on the day before major earnings announcements. For 1,474 of the 1,492 events in this sample, at least one older accountholder trades on the day before the announcement. Based on these trades, older investors also significantly outperform the market, with a mean signed *CAR*(0, +1) of 0.25% (*p*-value = 0.04). The third column in Panel A of Table 2 then compares the average

performance across the two age groups. The mean difference *t*-test indicates that the 1.10% difference in the average signed *CAR*(0, 1) is significant (*p*-value = 0.01).

The second set of three columns in Panel A of Table 2 presents analogous results for trades made two days before the earnings announcement. Now the mean signed *CAR*(0, +1) is 0.89% (*p*-value = 0.23) for young accountholders and 0.00% (*p*-value = 0.99) for older investors. The difference between these mean signed *CARs* equals 0.88% and is significantly different from zero (*p*-value = 0.04). In the last three columns, for trades made three days before the announcement, the mean signed *CAR*(0, +1) for young accountholders is 1.43% (*p*-value = 0.05), while the analogous result for older accountholders is −0.11% (*p*-value = 0.36). The difference in these mean signed *CARs* is a significant 1.54% (*p*-value = 0.01).

In Panel B of Table 2 we report the analogous performance of trades prior to large absolute price changes. The most dramatic results appear in the first three columns for trades made one day before these events, where young accountholders have a significant mean signed *CAR*(0, +1) of 2.00% (*p*-value = 0.03). In contrast, older investors slightly underperform the market with an insignificant mean signed *CAR*(0, +1) of −0.09%, (*p*-value = 0.67). The 2.1% difference in the mean signed *CAR*(0, +1) across the two age groups is significant at the 0.01 level.

The second set of three columns in Panel B of Table 2 reports the analogous results based on trades made two days before large price changes. In this set of results, neither age group significantly outperforms the other. In the third set of columns, based on trades made three days before the event, young investors once again significantly outperform older investors. The difference in the mean signed *CAR*(0,+1) is 1.18% (*p*-value = 0.08).

Similar analysis of earlier trades up to six weeks before earnings announcements and large price changes reveals no substantive evidence of earlier outperformance by either young or older accountholders.

Table 3 Performance of young versus older accountholders before takeover announcements.

Panel A. Trades during the three days before takeover announcements

	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	Trades on day-1			Trades on day-2			Trades on day-3		
	Young	Older	Diff.	Young	Older	Diff.	Young	Older	Diff.
n	23	140		15	141		20	140	
CAR(0, +1)%	12.73	−0.32	13.05	5.01	0.58	4.44	13.92	0.40	13.52
(*p*-value)*	0.15	0.77	**0.00***	0.13	0.49	**0.10***	0.15	0.56	**0.00***
Frequency	0.72	0.47	0.24	0.77	0.50	0.27	0.78	0.54	0.24
(*p*-value)*	**0.02***	0.18	**0.00***	**0.03***	0.94	**0.00***	**0.01***	0.14	**0.00***

This table presents the mean cumulative abnormal return around takeover announcements (*CAR*(0, +1)) for trades by young or older investors before the announcement. Diff. represents the differential mean performance of young versus older investors. All returns are in percentage points. *P*-Values highlighted with * represent significance at the 0.10 level or better.

3.2 *Event study results for merger and acquisition announcements*

Table 3 presents the results for trades made by young versus older accountholders prior to takeover announcements. The three columns in each set of results apply the same analysis as before. The first column of Panel A in Table 3 is based on the 23 takeover announcements in our sample where young investors trade on day -1. This column reveals an average signed $CAR(0, +1)$ that is very large in magnitude, at 12.7%, although it is not statistically significant (p-value $= 0.15$). We also find that on the day before takeover announcements young investors trade in the correct direction 72% of the time, which is significantly higher than the 50% success rate expected by chance (p-value $= 0.02$).

In comparison, the second column of Panel A in Table 3 is based on the 140 takeover announcements for which at least one older investor trades on day $t - 1$. This column reveals that older investors earn a mean signed $CAR(0, +1)$ of -0.32% (p-value $= 0.77$). Clearly older investors perform poorly, on average, when they trade on the day before takeover announcements.

For each of the three days before takeover announcements we find that young investors significantly outperform older investors. Moreover, as reported in Berkman *et al.* (2014), this extraordinary performance by young investors also extends to their earlier trades made during the six weeks prior to the announcement. It is important to note that this result does not change when we account for the potential bias due to the tendency of young accountholders to buy more frequently than older investors. That is, when we compare the mean performance of trades by young and older investors relative to a "normal" benchmark based on their respective average propensities to buy and sell, we still find that the mean difference between adjusted signed *CARs* for young versus older accountholders tends to be significantly positive during the six weeks prior to the takeover announcement (for details, see Berkman *et al.*, 2014).

Based on the evidence in Tables 2 and 3, we conclude that a large proportion of trades by young accountholders before major information events is motivated by superior private information that is about to become public.

3.3 *Performance of guardians before major information events*

We repeat the event study analysis of Tables 2 and 3 for the trades made by guardians matched to underaged accountholders, either by family name or by similar trades in corporate accounts. These results show that the guardians behind underaged accounts perform very well when they trade in their own accounts, as well as the accounts of their children, on the days before major earnings announcements and large price changes. In contrast, it appears that informed guardians are reticent to trade in their own accounts in the days before takeover announcements, while they do outperform dramatically when they make such trades through the accounts of children.

4 Trading through underaged accounts, information asymmetry, and stock returns

The previous sections clearly show that underaged accountholders are extremely successful at picking stocks. Based on this finding, we propose a novel proxy for stock-specific information asymmetry during month $m - 1$, labeled $BABYPIN_{m-1}$, which is defined as the proportion of total trading activity through the accounts of children aged 0–10 years, averaged over three months ($m - 1$, $m - 2$ and $m - 3$).

With this measure, we test the proposition in Easley and O'Hara (2004) that investors demand

a higher return for holding stocks with a greater likelihood of private information. Our most basic test of this proposition is to compare the average returns in month m for tercile portfolios of stocks sorted each month by our proxy for information asymmetry in the previous month, $BABYPIN_{m-1}$. We present these results in Figure 4.

The left box in Figure 4 shows that the tercile of stocks with the lowest value of $BABYPIN_{m-1}$ generates a mean return of -0.19% per month (t-ratio $= -0.2$), whereas the tercile with the highest $BABYPIN_{m-1}$ has a mean return of 0.93% per month (t-ratio $= 1.5$). The right box in Figure 4 indicates that the difference between these mean returns represents an average raw "*BABYPIN* hedge portfolio" return of 1.1% per month, which is significant at the 0.05 level (t-ratio $= 2.1$). This evidence shows that stocks with a high level of *BABYPIN* significantly outperform stocks with low *BABYPIN* in the following month.

We obtain similar results in more sophisticated tests where we calculate the alphas from time-series regressions of the return on these monthly *BABYPIN* hedge portfolios against: (i) the three Fama–French factors, or (ii) the three Fama–French factors plus the world market excess return. Furthermore, using cross-sectional regression analysis, we show that the positive relation between realized returns in month m and *BABYPIN* in month $m-1$ is robust to controlling for various firm characteristics such as size, beta, book-to-market ratio, momentum returns, spread, and the traditional *PIN* measure.

Overall, our asset-pricing tests are consistent with the view that a higher level of *BABYPIN* reveals a greater likelihood of trading against an informed

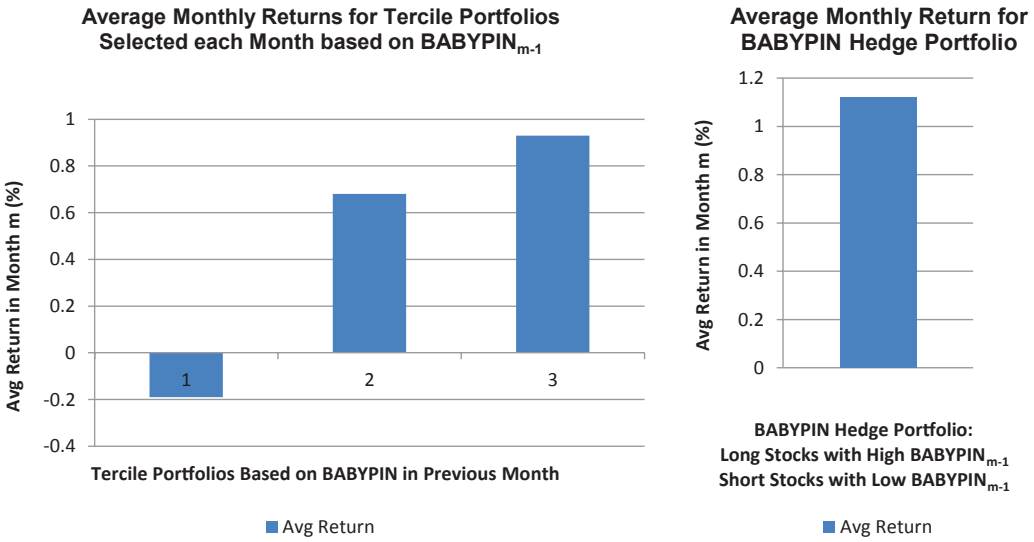

Figure 4 The relation between BABYPIN in one month and stock returns in the following month: Portfolio test.

This figure presents the results from a portfolio test in which we first rank all stocks into terciles each month, according to their value of BABYPIN in the previous month ($BABYPIN_{m-1}$). On the left side of this figure, we present the mean return during the following month (m), for each "BABYPIN-Tercile Portfolio." On the right side, we provide the mean return in the following month (m), from a hedge portfolio that goes long the tercile of stocks each month with high values of $BABYPIN_{m-1}$, and short the tercile with low values of $BABYPIN_{m-1}$. This portfolio is labeled the "BABYPIN-Hedge Portfolio."

investor, and represents a risk that is priced in capital markets. These results provide support for theoretical models in which the risk of informed trading is an important determinant of the cross section of stock returns (e.g., see Easley and O'Hara, 2004; Lambert *et al.*, 2011).

5 Summary and conclusions

We show that the guardians behind the accounts of young children, aged 0–10 years, exhibit superior stock-picking skills on both the buy side and the sell side. Underaged accountholders perform especially well when they trade in the days before major earnings announcements, large absolute price changes, and takeover announcements. Further analysis shows that the guardians of these underaged accounts also outperform other adults when they purchase stocks through their own accounts. The guardians, however, outperform other adults by a greater margin when they trade through underaged accounts. It appears that observing the trading activity through underaged accounts provides an effective mechanism for filtering out valuable private information from informed guardians.

Based on these findings, we propose that the proportion of total trading activity through underaged accounts (*BABYPIN*) serves as a useful measure of the probability of information-based trading in a particular stock. We analyze the association between *BABYPIN* and future stock returns, and find strong empirical support for theoretical models in which investors demand a higher return for holding stocks with a greater likelihood of trading against an informed investor, as proxied by *BABYPIN*.

Acknowledgments

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Notes

1 More recently, Lambert *et al.* (2011) show that imperfect competition leads to differential private information having an impact on prices, and this impact is stronger for illiquid stocks.

2 Expanding this classification to include an older group of children gives somewhat worse performance. In Berkman *et al.* (2014), we present evidence that a large proportion of trades by children and young adults between 10 and 20 years old is *not* initiated by *informed* guardians, but appears to be motivated by liquidity needs or financial education.

3 For example see U.S. SEC Litigation Release No. 20115 (May 14, 2007, http://www.sec.gov/litigation/litreleases/2007/lr20115.htm), U.S. SEC Litigation Release No. 21271 (October 30, 2009, http://www.sec.gov/litigation/litreleases/2009/lr21271.htm), U.S. SEC Litigation Release No. 21578 (Nov. 30, 2010, http://www.secactions.com/?p=2834), and http://yle.fi/uutiset/news/2010/11/environment_minister_cleared_of_insider_trading_suspicion_2137950.

4 This computation ignores the transaction costs that would be incurred in daily rebalancing of this portfolio.

5 The results in this section are based on the most simple model in Table 2 in Berkman *et al.* (2014). We find similar results using the methodology in Grinblatt *et al.* (2012), which allows us to document the marginal effect of investor age on performance, while controlling for other relevant variables such as the firm's beta, size, past returns, and book-to-market ratio. In the Internet Appendix E of Berkman *et al.* (2014) we provide more evidence on the robustness of our results. We also show that a calendar-time portfolio approach produces similar results.

6 The abnormal return of a stock is defined as the actual return minus the return on the value-weighted All-Share Index (where the maximum weight of one stock is limited to 10% of the total market value of the index).

7 See Berkman *et al.* (2014) for further details.

[8] This table reproduces the results in Table IV from Berkman *et al.* (2014).

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Keywords: Market efficiency; information asymmetry; informed trading; insider trading