Left-Digit Bias, Investor Attention and Trading Behavior

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February 13, 2020

Abstract

Abstract here

Keywords: words

JEL Codes: codes

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We show left-digit bias in stock-selling behavior of individual investors. Left-digit bias is the tendency to focus on the leftmost digit of a number while partially ignoring other digits (Poltrock and Schwartz, 1984). Our contribution is to show that investors are disproportionately attentive to the leftmost digit in their trading choices, the salience of prices matters for investment choices (is this what we think is going on? This is similar to the rank effect finding of Hartzmark (2015), whereby either top-ranked or bottom-ranked stocks by return since purchase are those most likely to be sold. We contribute to the broader literature on left-digit bias, including Lacetera et al. (2012) and Shlain (2018). Our study contributes to our understanding of when and why investors sell stocks.

1 Data and Sample Selection

We use the Barclays data. We first do some basic data cleaning, with details shown in Table 1.

We then choose a sample for analysis. A key element in our analysis is to draw a price increasing sample and a price decreasing sample, because we will show that the probability of sale increases with a change in the left digit both from below and from above.

We define these samples as follows. First, using the example of price increasing, we identify the first day in each calendar quarter on which an investor made a login to their account. We then define the price increasing sample as the set of login days within the quarter for which the prices on subsequent login days were always above the price on the first day and the left-digit had changed within the quarter on at least one subsequent login-day. We define the price decreasing sample as the set of login days within the quarter for which the prices on subsequent login days were always below the price on the first day and the left-digit had changed within the quarter on at least one subsequent login-day. Our samples are based on quarters and individual $\times$ login days during the quarter. Due to the immense size of the data, we further restrict to a 30% random sample.

The idea behind this sample restriction is that we need to focus on changes in left-digit that the investor actually saw. By restricting to changes in the left digit as seen by investors on login-days, we know that the investor saw the below-price and then subsequently the above-price (or vice versa).

We show later that results are unchanged when we modify the period that defines a sample to either a month or a year.

Summary statistics are shown in Table 2. Note, there are four units of left-digit in the data, pennies, tens of pennies, pounds and tens of pounds (there are only a few cases of hundreds of pounds). So, the left-digit changes of interest are pence to tens of pence, tens of pence to pounds, and pounds to tens of pounds (plus a few cases of tens of pounds to hundreds of pounds). Most stocks in the samples are prices in the range £1.10 to £10.10. A histogram of prices for all investor $\times$ login days is shown in Figure A1.

2 Results

Our main result is shown in Figure 1. The figure stack all investor × stock × login days by the leftmost two digits. The figure plots in the left-side the probability of sale by leftmost digits, and in the right-side it plots the probability of sale by the leftmost two digits. For example, the left-side plot stacks up stocks which pass from 9 pence to 10 pence, 29 pence to 30 pence, 199 pence to 200 pence, and so on in every case in which the leftmost digit changes. These examples each enter the plot at X9 to Y0, where X and Y are integer units and $Y = X + 1$. The left-side plots show clear jumps in the probability of sale when the stock price crosses the leftmost digit; the right-side plots also show this phenomena, with the red bar denoting base 10 leftmost two digit prices. In Panel A there is a jump in probability of sale when the price crosses the left digit from below, e.g. 19 pence to 20 pence; in Panel B there is a jump when the price crosses the left digit from above, e.g. 20 pence to 19 pence. Note that in general the probability of sale is higher in the price increasing sample than in the price decreasing sample, consistent with the disposition effect. Figure 2 and Figure 3 show that the left-digit effect occurs in each of the pennies, pounds and tens of pounds samples.

We estimate the size of the left-digit effect in Table 3 and Table 4. The regression setup is a discontinuity regression which pools all of the observations from the sample (increasing or decreasing) and regresses the probability of sale against a dummy for the price being above the left-digit change, plus continuous controls for the leftmost two digits below and above the left-digit change. The coefficient in Column 2 implies that a stock that has crossed the left-digit from below is 50% more likely to be sold. The coefficient value is stable across specifications, including a rich specification in Column 5 that includes day, industry, account, and stock fixed effects. That specification therefore exploits within-investor, within-stock variation in the probability of sale, conditioning on day and industry differences EQ:[I will drop industry here, because it is accounted by the stocks] in the likelihood of sale. In the price-decreasing sample the coefficient estimate in Column 1 implies a 25% increase in probability of sale when the left-digit changes from above (note the coefficient are negative, reporting the effect of a change from below). Table A1 and Table A2 report regressions from the subsamples by pennies, pounds and tens of pounds.

2.1 Robustness

We test for a variety of robustness concerns

- Limit orders. The effect we see might in some cases be due to limit orders set at left-digit changes. However, while the strike price of the limit order would be at exactly the left-digit change, we see an elevated probability of sale across the range Y0 to Y5.
- Sample selection. We might be worried that our results are somehow due to sample selection. Therefore, we conduct a simulation analysis in which we assign sales randomly to investor × stock × days in each sample. Figure A2 shows that with randomly allocated

sales we see no evidence of discontinuity in the probability of sale when the leftmost digit changes.

- Quarter time period. One might worry that this also somehow creates a selection effect. We therefore conduct the same analysis, with the same results, on samples where the time period is defined as a month in Figure A3 and as a year in Figure A4. See Table A3 for summary statistics and Table A4 and Table A5 for regression estimates.
- Sell-day sample. We see the same result in the sell-day sample in Figure A5, with again the same patterns in sub-samples by pennies, pounds and tens of pounds in Figure A6 and Figure A7. See Table A6 and Table A7 for regression estimates, plus Table A8 and Table A9 for regression estimates using the sub-samples by pennies, pounds and tens of pounds.

2.2 Investor Characteristics

We use sample splits and test for differences in the left-digit effect by various investor characteristics

- Age: stronger among younger investors (Table 5).
- Gender: no differences (Table 6).
- Portfolio value: stronger among small portfolios (Table 7).
- Tenure: stronger among younger accounts (Table 8).
- Number of Stocks: stronger with fewer stocks (Table 9).

3 Possible Extensions

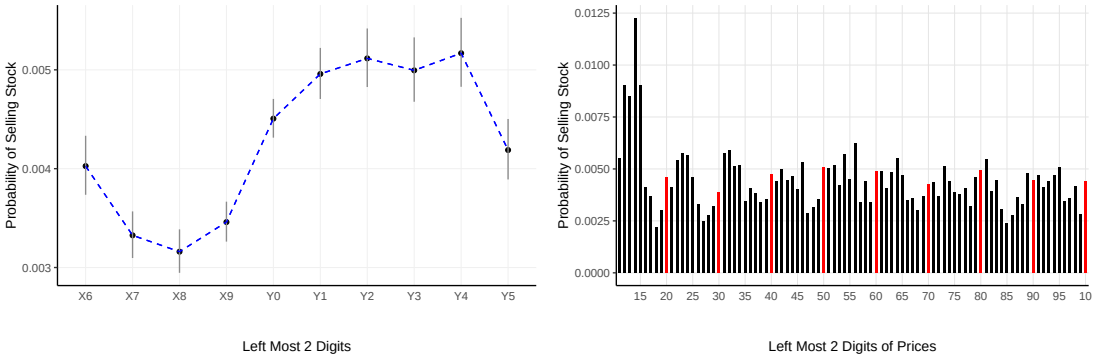
We should look at the robustness tests used by Hartzmark (2015) as some may be applicable here.

Can we say something about aggregate effects on investor behavior? The effect size in the regressions in very large, so maybe we see some aggregate effects? EQ:[but note that these analysis only work when we use login days. Using market days there is no pattern at all. So any aggregate analysis has to be restricted to login days]

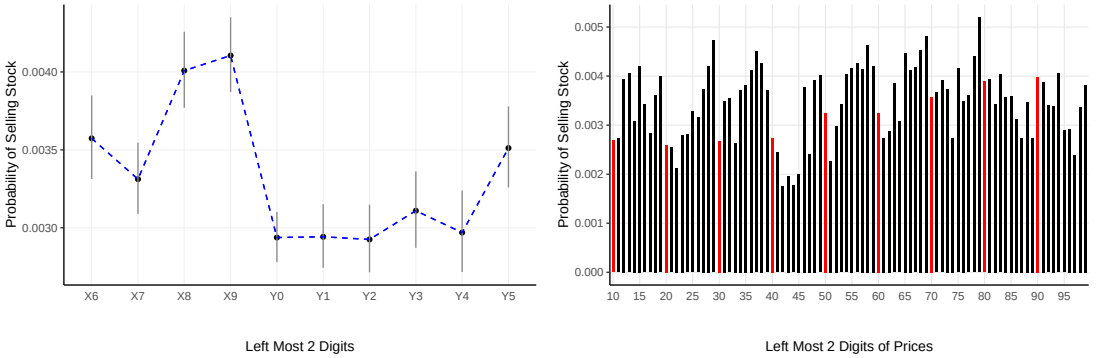
Other angles?

Figure 1: Leftmost Stock Price Digit and Probability of Sale, Quarterly Sample

(A) Price Increasing



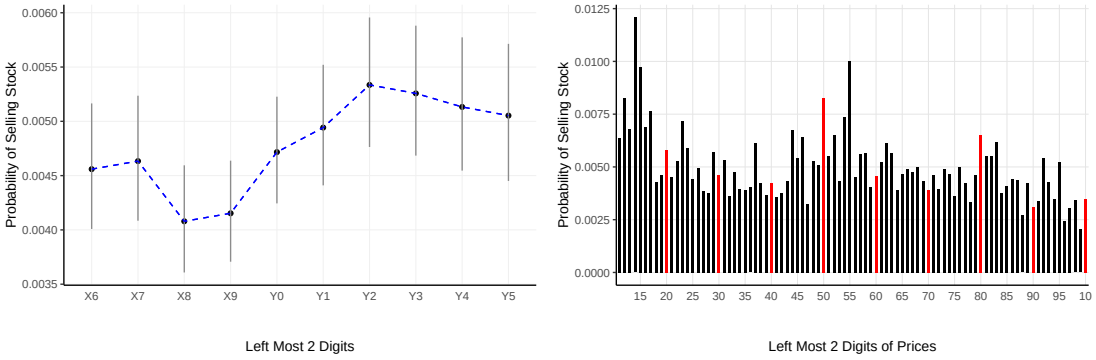
(B) Price Decreasing



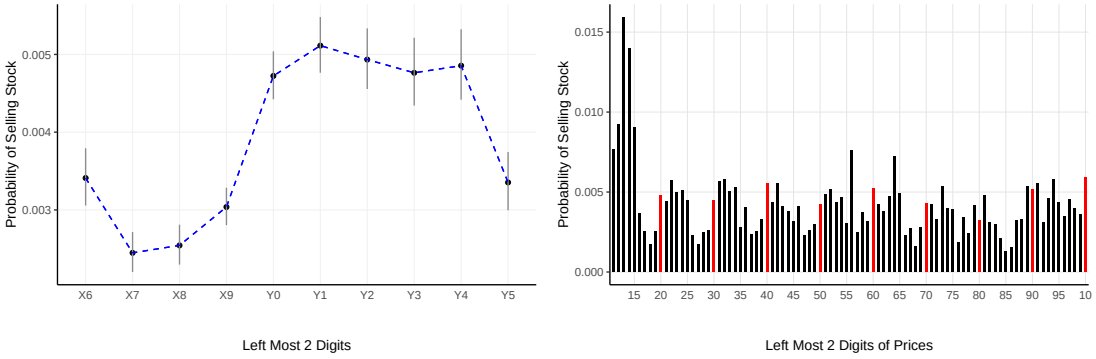
Note: £Y in the X-axes is equivalent to £$X+1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.).

Figure 2: Leftmost Stock Price Digit and Probability of Sale
Prices Increasing Sample by Price Range

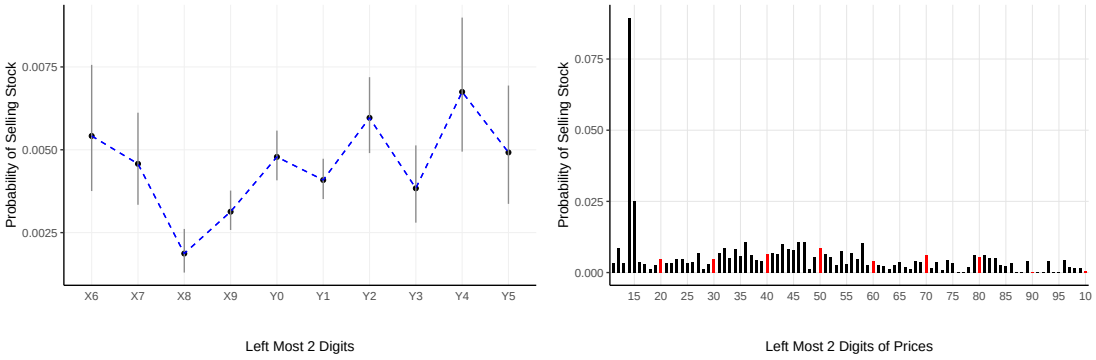
(A) Price = £0.11 to £1.01



(B) Price = £1.01 to £10.1



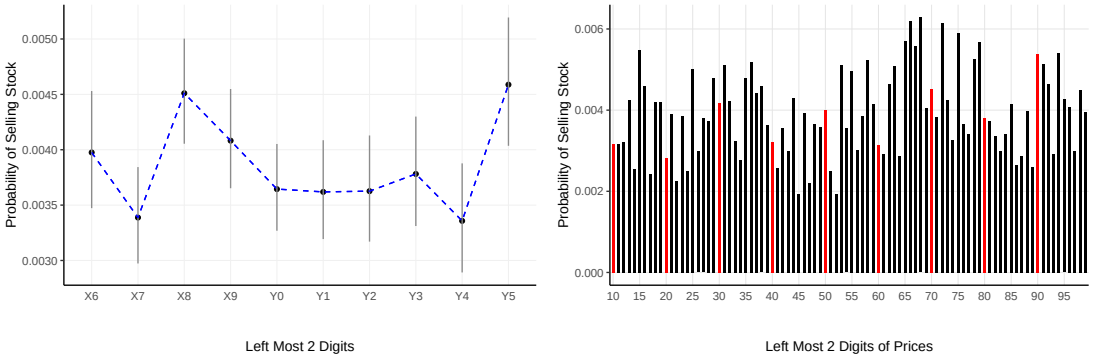
(C) Price = £11 to £101



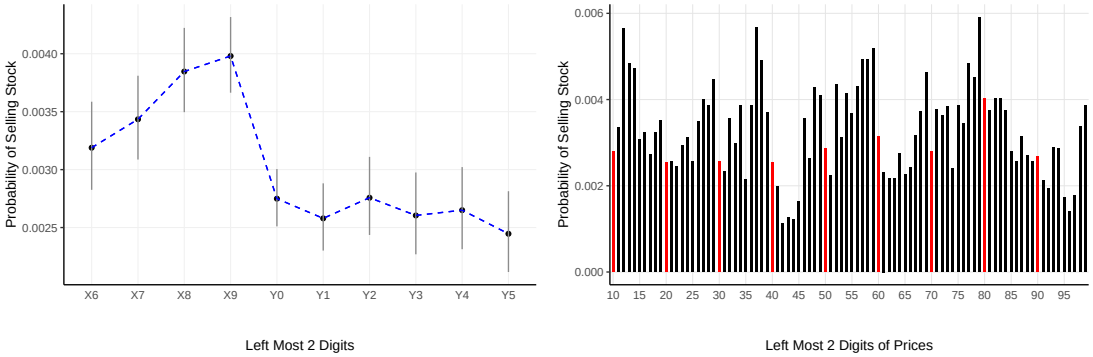
Note: £Y in the X-axes is equivalent to £$X + 1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.). Panels A, B and C show equal size bins of 1p, 10p and £1, respectively. Panel A corresponds to 25% of the observations in the prices increasing sample; Panel B, to 55%; and Panel C, to 8%.

Figure 3: Leftmost Stock Price Digit and Probability of Sale
Prices Decreasing Sample by Price Range

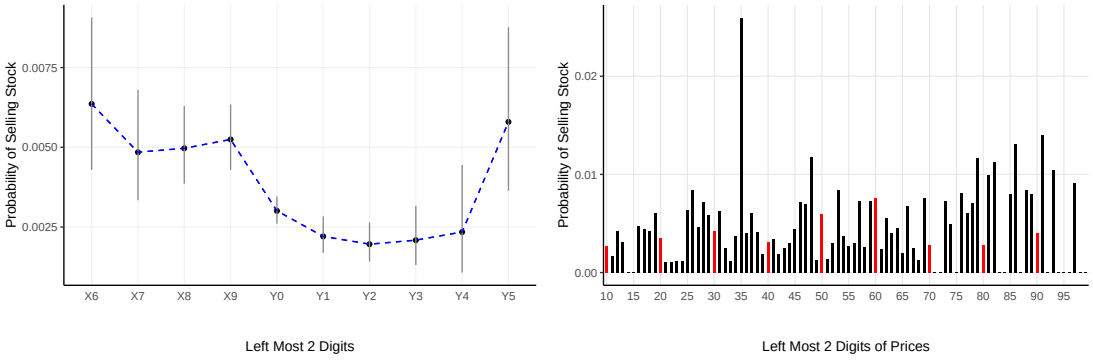
(A) Price = £0.10 to £1.00



(B) Price = £1.00 to £10.0



(C) Price = £10 to £100



Note: £Y in the X-axes is equivalent to £$X + 1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.). Panels A, B and C show equal size bins of 1p, 10p and £1, respectively. Panel A corresponds to 27% of the observations in the prices decreasing sample; Panel B, to 43%; and Panel C, to 7%.

Table 1: Sample Selection

	Accounts	Logins	Transactions	Sells
Unrestricted Sample	45919	67734059	1228755	493041
Drop due to:				
Inactive Accounts	14370	7932474	46982	19562
Unmatched Prices	306	13009351	129314	49012
At Least Two Stocks in Portfolio	3062	720291	76539	32652
Missing Demographic Data	1137	1793831	37427	16400
Starting Position Days	23	367341	331557	25479
Trades Outside Market Hours	0	7659	7659	7659
Baseline sample	27021	43903112	599277	342277

Note: The unrestricted sample contains 155,300 accounts. We use a 30% random sample of accounts. The table detail the steps in sample selection. Logins, Transactions, and Sells reflect the number of observations for each category at the Account × Stock × Day level.

Table 2: Summary Stats, Quarterly Sample

Panel (A): Baseline Sample

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Price on Login Days £	43,683,895	7.948	26.216	0.000	1.155	3.051	7.650	15,051.630
Price on Sell Days £	3,121,883	7.126	24.981	0.000	0.830	2.645	6.676	3,589.000
Price of Stocks Sold £	123,126	6.966	16.113	0.000	0.886	2.800	6.700	1,120.300

Panel (B): Price Increasing Sample

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
All Stocks	2,485,934	6.442	23.494	0.000	0.740	2.995	6.180	3,600.000
Stocks with Prices Between £0.11 to £1.01	611,580	0.600	0.256	0.110	0.382	0.628	0.811	1.010
Stocks with Prices Between £1.1 to £10.1	1,363,062	4.890	2.310	1.100	2.954	4.570	6.600	10.100
Stocks with Prices Between £11 to £101	191,266	35.679	22.239	11.000	19.720	29.760	48.006	100.995

Panel (C): Price Decreasing Sample

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
All Stocks	2,514,845	4.260	20.210	0.000	0.165	1.025	4.517	3,284.000
Stocks with Prices Between £0.10 to £1.0	684,524	0.511	0.270	0.100	0.275	0.485	0.750	1.000
Stocks with Prices Between £1 to £10	1,090,912	4.517	2.508	1.000	2.368	4.136	6.231	10.000
Stocks with Prices Between £10 to £100	179,560	25.789	18.953	10.000	10.931	20.875	30.350	99.990

Table 3: Probability of Sale and Left Digit, Price Increasing Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0013***	0.0015***	0.0014***	0.0018***	0.0020***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock Digits Y0 to Y5		0.0000	-0.0000	-0.0001***	-0.0002***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		-0.0001**	-0.0001*	-0.0001**	-0.0001*
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0035***	0.0033***	0.0015***		
	(0.0001)	(0.0001)	(0.0005)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	2,485,934	2,485,934	2,485,934	2,485,934	2,485,934
R^2	0.0001	0.0001	0.0014	0.0593	0.0630

Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks increased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that have changed the left most digit are included. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (X0). SE are clustered by account.

Table 4: Probability of Sale and Left Digit, Price Decreasing Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0007***	-0.0012***	-0.0013***	-0.0011***	-0.0011***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock Digits Y0 to Y5		0.0001***	0.0001***	0.0002***	0.0002***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		0.0002***	0.0003***	0.0001*	0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0038***	0.0041***	0.0038***		
	(0.0001)	(0.0001)	(0.0007)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	2,514,845	2,514,845	2,514,845	2,514,845	2,514,845
R^2	0.0000	0.0001	0.0010	0.0587	0.0629

Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks have not increased in price (regarding the first observation of the quarter) and have not changed the left most digit at least once during the quarter. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (X0). SE are clustered by account.

Table 5: Probability of Sale and Left Digit, Splitting by Median Age

	Prices Increasing Sample		Prices Decreasing Sample	
	Below Median	Above Median	Below Median	Above Median
Above Y0 = 1 (in Range Y0 to Y5)	0.0023***	0.0017***	-0.0011***	-0.0011***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stock Digits Y0 to Y5	-0.0002***	-0.0002***	0.0001***	0.0002***
	(0.0001)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9	-0.0001	-0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Day FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Account FE	YES	YES	YES	YES
Stock FE	YES	YES	YES	YES
Observations	1,336,066	1,149,868	1,382,948	1,131,897
R^2	0.0724	0.0493	0.0742	0.0497

Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks increased/decreased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that have changed the left most digit are included. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (Y0). SE are clustered by account.

Table 6: Probability of Sale and Left Digit, Splitting by Gender

	Prices Increasing Sample		Prices Decreasing Sample	
	Female	Male	Female	Male
Above Y0 = 1 (in Range Y0 to Y5)	0.0020***	0.0020***	-0.0010***	-0.0011***
	(0.0003)	(0.0002)	(0.0003)	(0.0002)
Stock Digits Y0 to Y5	-0.0002**	-0.0002***	0.0002**	0.0002***
	(0.0001)	(0.0000)	(0.0001)	(0.0000)
Stock Digits X6 to X9	-0.0001	-0.0001*	0.0003**	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Day FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Account FE	YES	YES	YES	YES
Stock FE	YES	YES	YES	YES
Observations	426,414	2,059,520	399,542	2,115,303
R^2	0.0719	0.0628	0.0825	0.0619

Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks increased/decreased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that have changed the left most digit are included. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (Y0). SE are clustered by account.

Table 7: Probability of Sale and Left Digit, Splitting by Portfolio Value

	Prices Increasing Sample		Prices Decreasing Sample	
	Below Median	Above Median	Below Median	Above Median
Above Y0 = 1 (in Range Y0 to Y5)	0.0028***	0.0011***	-0.0013***	-0.0008***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stock Digits Y0 to Y5	-0.0003***	-0.0000	0.0002***	0.0001***
	(0.0001)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9	-0.0001	-0.0002**	0.0002**	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Day FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Account FE	YES	YES	YES	YES
Stock FE	YES	YES	YES	YES
Observations	1,344,432	1,141,502	1,399,385	1,115,460
R^2	0.0895	0.0374	0.0920	0.0382

Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks increased/decreased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that have changed the left most digit are included. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (Y0). SE are clustered by account.

Table 8: Probability of Sale and Left Digit, Splitting by Account Tenure

	Prices Increasing Sample		Prices Decreasing Sample	
	Below Median	Above Median	Below Median	Above Median
Above Y0 = 1 (in Range Y0 to Y5)	0.0023***	0.0016***	-0.0013***	-0.0009***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stock Digits Y0 to Y5	-0.0002***	-0.0002***	0.0002***	0.0001***
	(0.0001)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9	-0.0001	-0.0001	0.0001	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Day FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Account FE	YES	YES	YES	YES
Stock FE	YES	YES	YES	YES
Observations	1,225,459	1,260,475	1,272,518	1,242,327
R^2	0.0706	0.0569	0.0689	0.0596

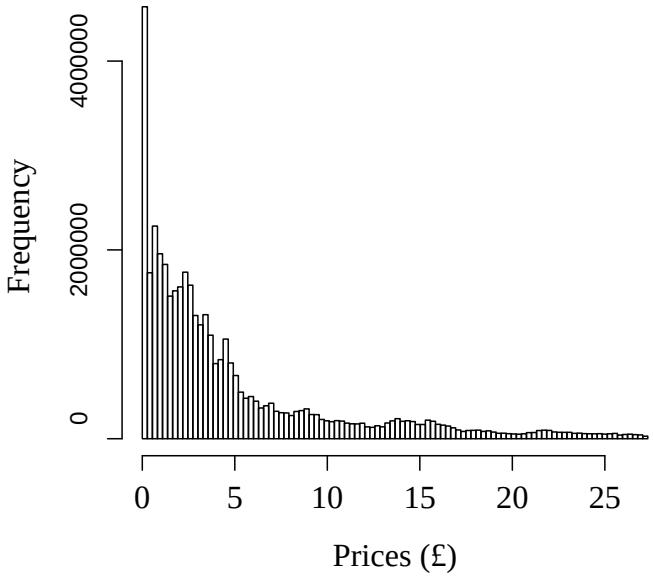
Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks increased/decreased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that have changed the left most digit are included. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (Y0). SE are clustered by account.

Table 9: Probability of Sale and Left Digit, Splitting by Number of Stocks

	Prices Increasing Sample		Prices Decreasing Sample	
	Below Median	Above Median	Below Median	Above Median
Above Y0 = 1 (in Range Y0 to Y5)	0.0028***	0.0009***	-0.0016***	-0.0006***
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Stock Digits Y0 to Y5	-0.0003***	-0.0000	0.0002***	0.0001***
	(0.0001)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9	-0.0001	-0.0001*	0.0003***	-0.0001*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Day FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Account FE	YES	YES	YES	YES
Stock FE	YES	YES	YES	YES
Observations	1,408,279	1,077,655	1,334,529	1,180,316
R^2	0.0770	0.0265	0.0805	0.0322

Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks increased/decreased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that have changed the left most digit are included. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (Y0). SE are clustered by account.

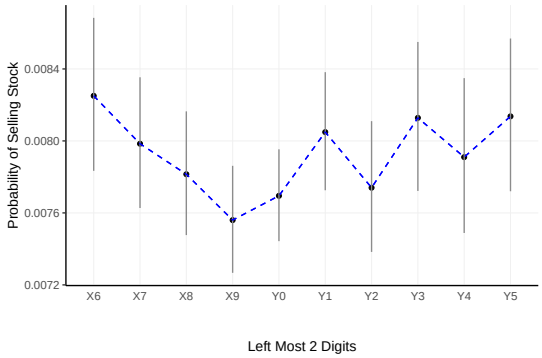
Figure A1: Histogram of Stock Prices



Note: Figure shows the histogram of prices on login days. Outliers above the 95 percentile are excluded.

Figure A2: Sample Selection and Simulation Exercise

(A) Price Increasing Sample



(B) Price Decreasing Sample

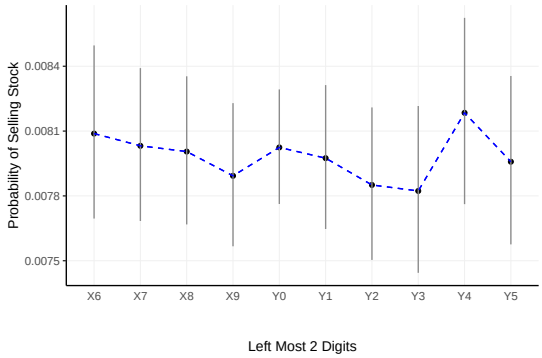
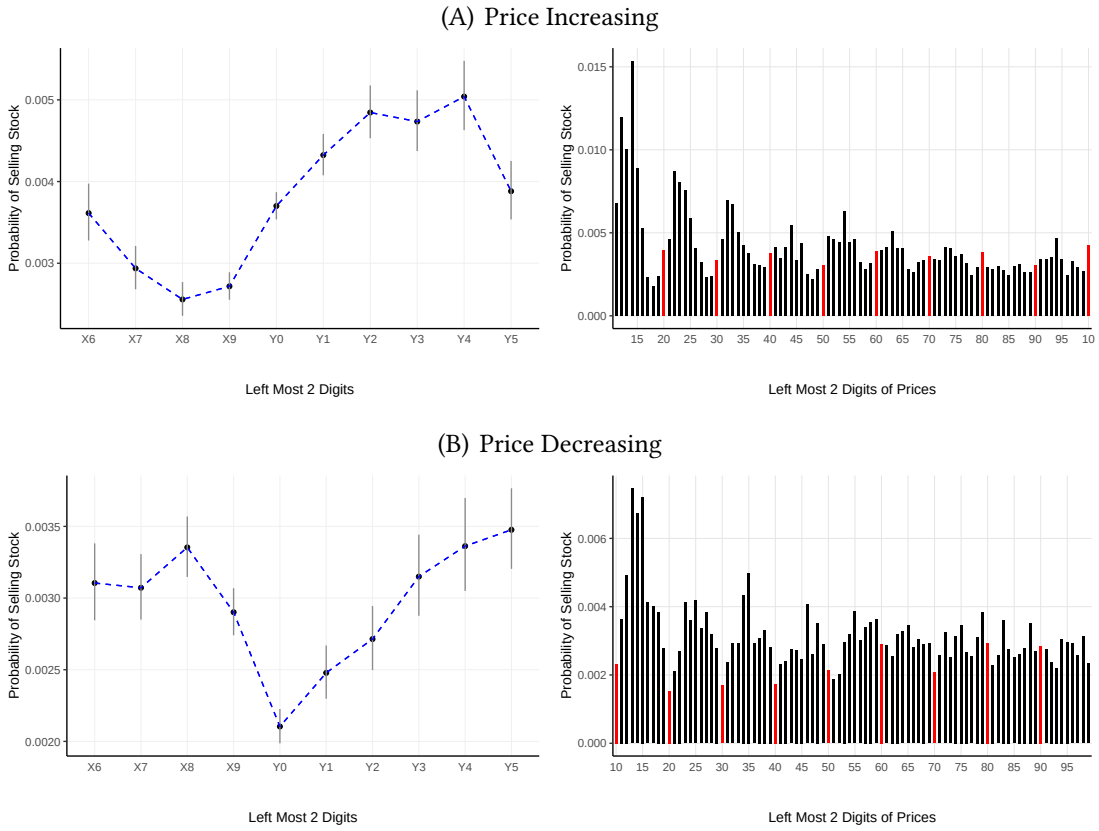
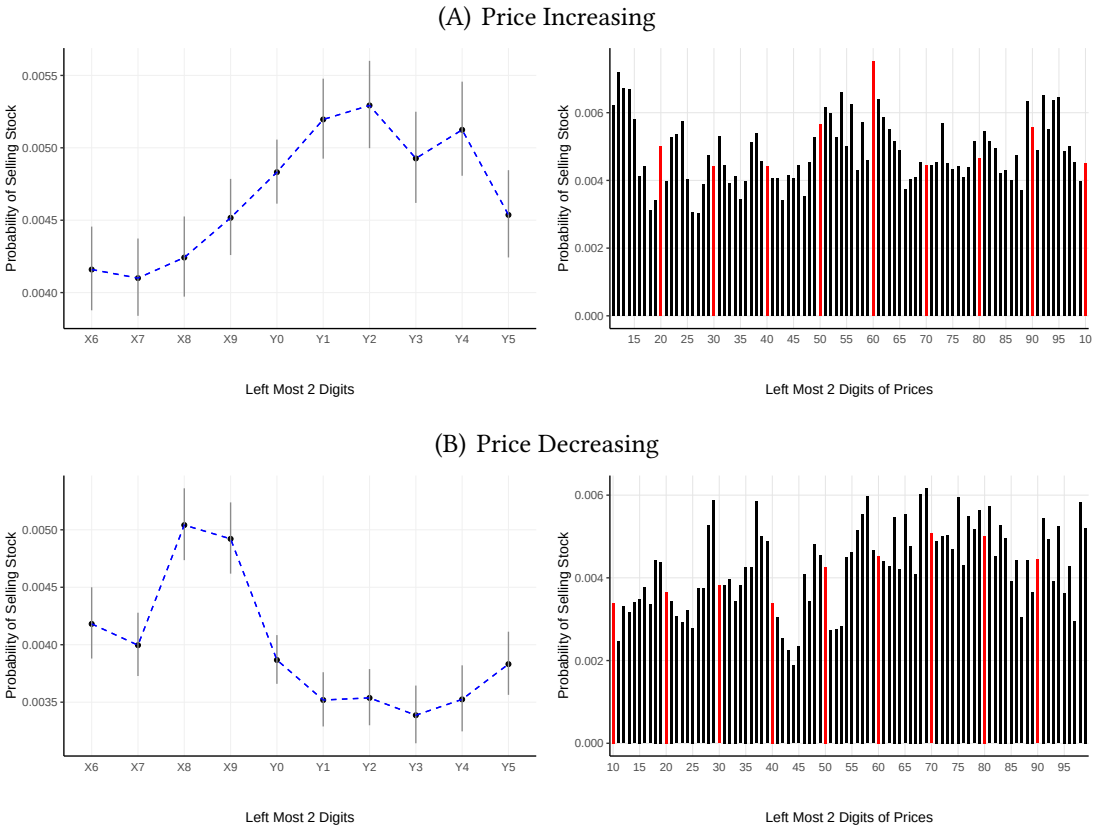


Figure A3: Leftmost Stock Price Digit and Probability of Sale, Monthly Sample



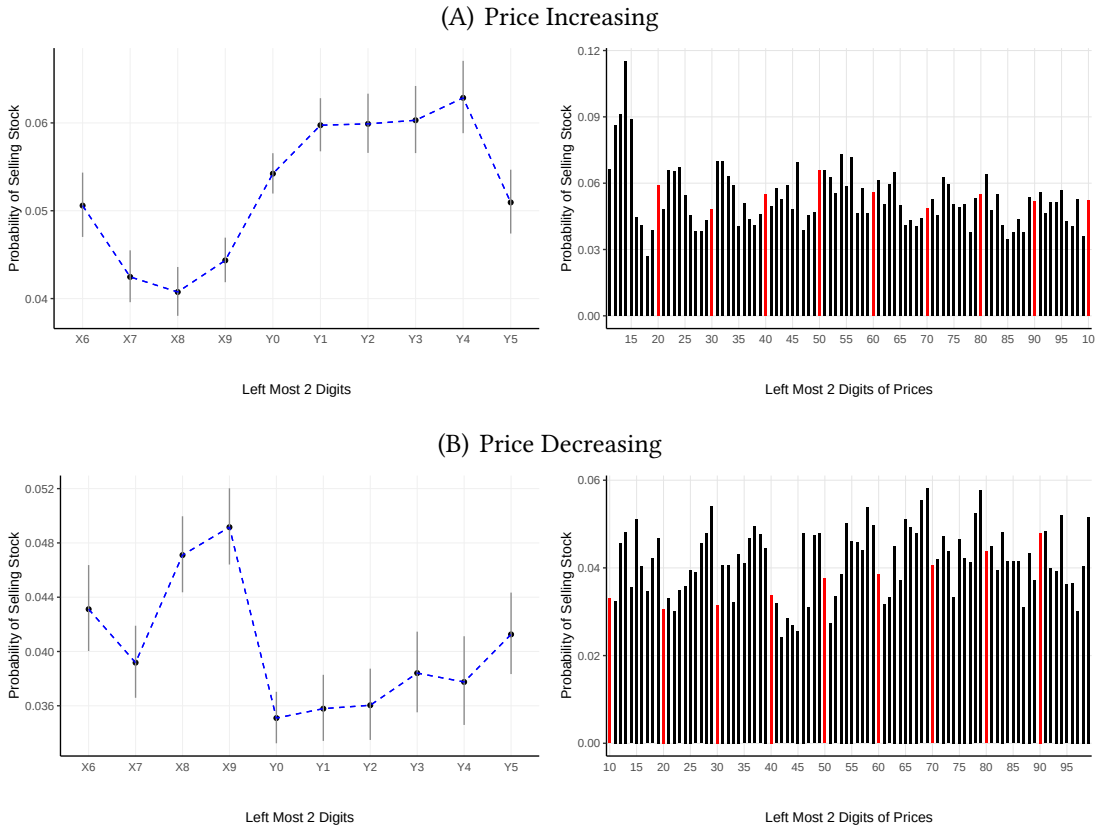
Note: £Y in the X-axes is equivalent to £$X+1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.).

Figure A4: Leftmost Stock Price Digit and Probability of Sale, Annual Sample



Note: £Y in the X-axes is equivalent to £$X+1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.).

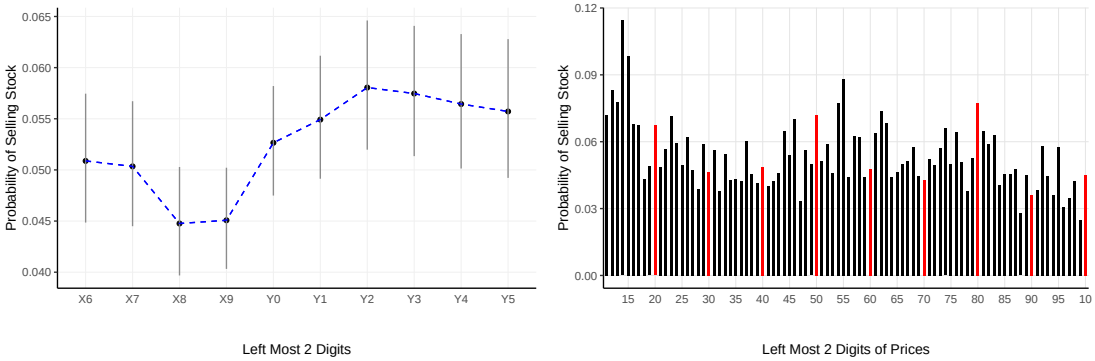
Figure A5: Leftmost Stock Price Digit and Probability of Sale, Sell Days



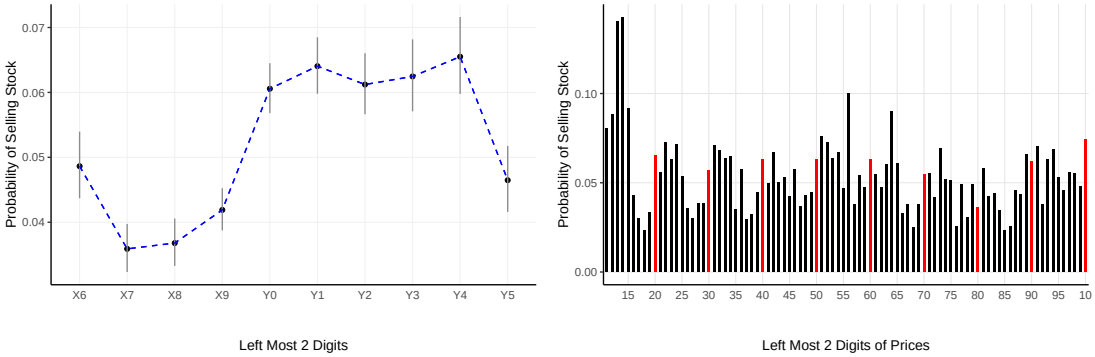
Note: £Y in the X-axes is equivalent to £$X+1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.).

Figure A6: Leftmost Stock Price Digit and Probability of Sale, Sell Days
Prices Increasing Sample by Price Range

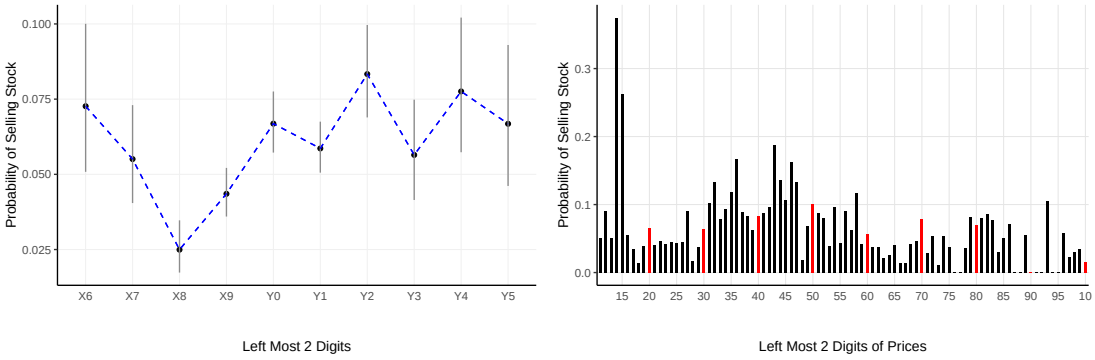
(A) Price = £0.11 to £1.01



(B) Price = £1.01 to £10.1



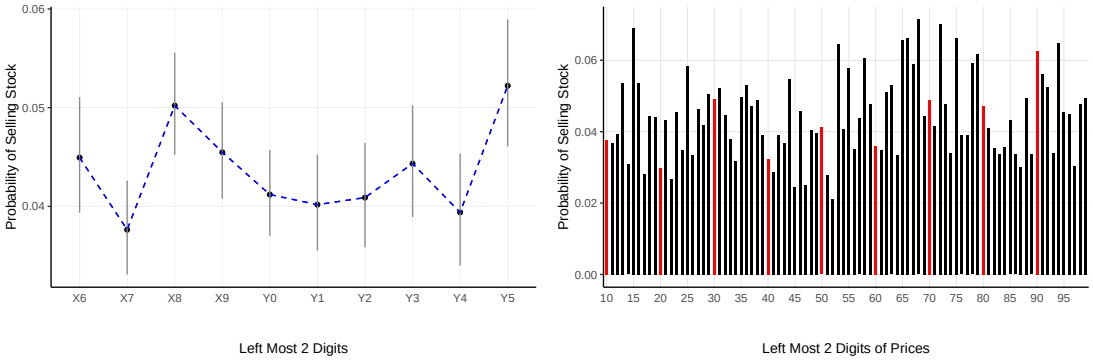
(C) Price = £11 to £101



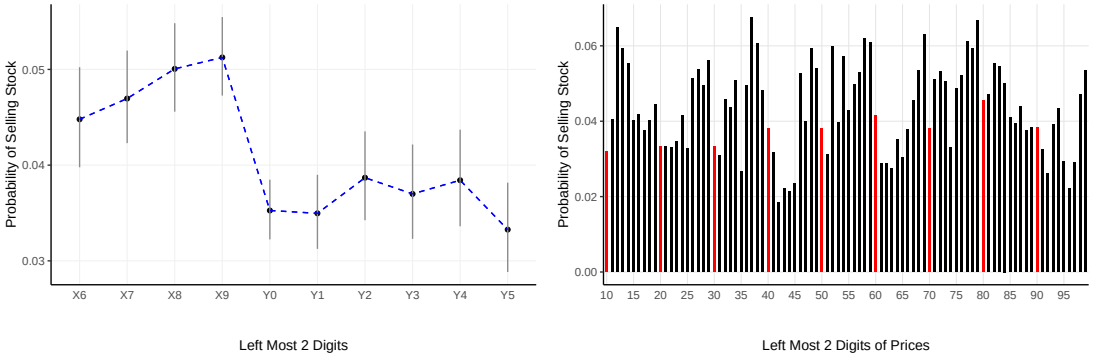
Note: £Y in the X-axes is equivalent to £$X+1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.). Panels A, B and C show equal size bins of 1p, 10p and £1, respectively.

Figure A7: Leftmost Stock Price Digit and Probability of Sale, Sell Days
Prices Decreasing Sample by Price Range

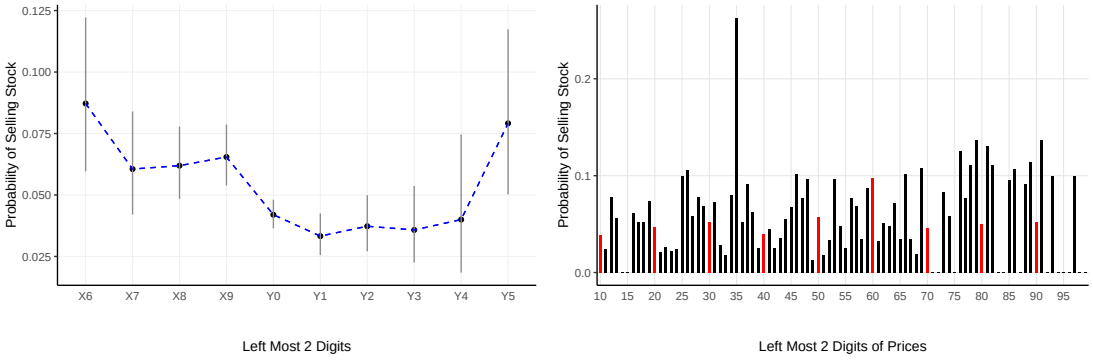
(A) Price = £0.10 to £1.00



(B) Price = £1.00 to £10.0



(C) Price = £10 to £100



Note: £Y in the X-axes is equivalent to £$X+1$ (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.). Panels A, B and C show equal size bins of 1p, 10p and £1, respectively.

Table A1: Price Increasing Subsamples with Equal Prices Bins

Panel (A): Price = £0.11 to £1.01

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0007***	0.0008***	0.0007**	0.0011***	0.0010***
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Stock Digits Y0 to Y5		0.0001	0.0001	-0.0000	-0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock Digits X6 to X9		-0.0002	-0.0001	-0.0001	-0.0002
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0043***	0.0041***	0.0064***		
	(0.0002)	(0.0002)	(0.0018)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	611,580	611,580	611,580	611,580	611,580
R^2	0.0000	0.0000	0.0019	0.0991	0.1091

Panel (B): Price = £1.01 to £10.1

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0019***	0.0023***	0.0022***	0.0023***	0.0023***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stock Digits Y0 to Y5		-0.0002***	-0.0002***	-0.0002***	-0.0002***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		-0.0000	-0.0000	-0.0001	-0.0000
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0028***	0.0028***	0.0059***		
	(0.0001)	(0.0001)	(0.0020)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	1,363,062	1,363,062	1,363,062	1,363,062	1,363,062
R^2	0.0002	0.0002	0.0013	0.0770	0.0888

Panel (C): Price = £11 to £101

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0015***	0.0018***	0.0020***	0.0026***	0.0027***
	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0005)
Stock Digits Y0 to Y5		0.0002	0.0001	0.0004**	0.0005***
		(0.0001)	(0.0002)	(0.0002)	(0.0002)
Stock Digits X6 to X9		-0.0006**	-0.0008***	-0.0007**	-0.0007**
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
Constant	0.0032***	0.0027***	-0.0029***		
	(0.0002)	(0.0003)	(0.0004)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	191,266	191,266	191,266	191,266	191,266
R^2	0.0001	0.0002	0.0018	0.1636	0.1761

Table A2: Price Decreasing Subsamples with Equal Prices Bins

Panel (A): Price = £0.10 to £1.00

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0007***	0.0008***	0.0007**	0.0011***	0.0010***
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Stock Digits Y0 to Y5		0.0001	0.0001	-0.0000	-0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock Digits X6 to X9		-0.0002	-0.0001	-0.0001	-0.0002
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0043***	0.0041***	0.0064***		
	(0.0002)	(0.0002)	(0.0018)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	611,580	611,580	611,580	611,580	611,580
R^2	0.0000	0.0000	0.0019	0.0991	0.1091

Panel (B): Price = £1.00 to £10.0

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0010***	-0.0013***	-0.0014***	-0.0015***	-0.0014***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stock Digits Y0 to Y5		-0.0000	-0.0000	0.0002***	0.0002***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		0.0003***	0.0003***	0.0001	0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0037***	0.0040***	0.0137*		
	(0.0001)	(0.0002)	(0.0075)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	1,090,912	1,090,912	1,090,912	1,090,912	1,090,912
R^2	0.0001	0.0001	0.0010	0.0877	0.0976

Panel (C): Price = £10 to £100

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0026***	-0.0024***	-0.0021***	-0.0015**	-0.0015**
	(0.0004)	(0.0005)	(0.0006)	(0.0006)	(0.0007)
Stock Digits Y0 to Y5		-0.0000	0.0001	0.0002	0.0002
		(0.0001)	(0.0001)	(0.0002)	(0.0002)
Stock Digits X6 to X9		-0.0002	-0.0002	-0.0008**	-0.0007*
		(0.0004)	(0.0004)	(0.0004)	(0.0004)
Constant	0.0052***	0.0051***	0.0000		
	(0.0004)	(0.0005)	(0.0005)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	179,560	179,560	179,560	179,560	179,560
R^2	0.0004	0.0004	0.0020	0.1459	0.1553

Table A3: Summary Stats for Annual and Monthly Samples

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Monthly Increasing Sample	2,208,102	5.651	27.026	0.000	0.565	2.753	6.064	3,600.000
Monthly Decreasing Sample	2,631,483	4.820	24.737	0.000	0.205	1.009	5.085	3,453.000
Annual Increasing Sample	2,334,527	8.351	24.499	0.000	1.080	3.681	7.365	3,600.000
Annual Decreasing Sample	2,159,023	4.077	21.166	0.000	0.155	1.080	4.258	2,062.035

Table A4: Price Increasing Samples, Monthly and Annual Samples

Panel (A): Monthly Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0014***	0.0014***	0.0013***	0.0016***	0.0017***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock Digits Y0 to Y5		0.0002***	0.0001***	0.0001	-0.0000
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		-0.0002***	-0.0001**	-0.0001	-0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0028***	0.0026***	0.0018***		
	(0.0001)	(0.0001)	(0.0006)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	2,208,102	2,208,102	2,208,102	2,208,102	2,208,102
R^2	0.0001	0.0001	0.0015	0.0563	0.0608

Panel (B): Annual Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0007***	0.0006***	0.0006***	0.0012***	0.0013***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stock Digits Y0 to Y5		-0.0000	-0.0001**	-0.0001***	-0.0002***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		0.0001**	0.0001**	0.0000	0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0043***	0.0044***	0.0016***		
	(0.0001)	(0.0001)	(0.0004)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	2,334,527	2,334,527	2,334,527	2,334,527	2,334,527
R^2	0.0000	0.0000	0.0019	0.0699	0.0746

Table A5: Price Decreasing Samples, Monthly and Annual Samples

Panel (A): Monthly Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0005***	-0.0009***	-0.0010***	-0.0010***	-0.0010***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock Digits Y0 to Y5		0.0003***	0.0003***	0.0003***	0.0003***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		-0.0001	-0.0000	-0.0001**	-0.0001
		(0.0001)	(0.0000)	(0.0000)	(0.0001)
Constant	0.0031***	0.0030***	0.0036***		
	(0.0001)	(0.0001)	(0.0005)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	2,631,483	2,631,483	2,631,483	2,631,483	2,631,483
R^2	0.0000	0.0001	0.0012	0.0508	0.0540

Panel (B): Annual Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0009***	-0.0013***	-0.0014***	-0.0010***	-0.0009***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Stock Digits Y0 to Y5		-0.0000	-0.0000	0.0001**	0.0001**
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits X6 to X9		0.0003***	0.0004***	0.0002**	0.0002**
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0045***	0.0050***	0.0041***		
	(0.0001)	(0.0002)	(0.0007)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	2,159,023	2,159,023	2,159,023	2,159,023	2,159,023
R^2	0.0000	0.0001	0.0012	0.0694	0.0739

Table A6: Probability of Sale and Left Digit, Price Increasing Sample, Sell Days

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0134***	0.0148***	0.0144***	0.0135***	0.0152***
	(0.0013)	(0.0017)	(0.0017)	(0.0017)	(0.0018)
Stock Digits Y0 to Y5		0.0003	0.0001	-0.0002	-0.0009**
		(0.0004)	(0.0004)	(0.0004)	(0.0004)
Stock Digits X6 to X9		-0.0015**	-0.0011	-0.0009	-0.0008
		(0.0007)	(0.0007)	(0.0007)	(0.0007)
Constant	0.0441***	0.0422***	0.0206***		
	(0.0022)	(0.0024)	(0.0058)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	201,912	201,912	201,912	201,912	201,912
R^2	0.0009	0.0009	0.0137	0.2841	0.3063

Note: The unit of observation is an investor × stock × day. The samples is restricted to sell days. We include only quarters in which the stocks increased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that have changed the left most digit are included. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (X0). SE are clustered by account.

Table A7: Probability of Sale and Left Digit, Price Decreasing Sample, Sell Days

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0080***	-0.0140***	-0.0139***	-0.0080***	-0.0070***
	(0.0010)	(0.0016)	(0.0016)	(0.0015)	(0.0015)
Stock Digits Y0 to Y5		0.0011***	0.0011***	0.0011***	0.0011***
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
Stock Digits X6 to X9		0.0028***	0.0030***	0.0006	0.0002
		(0.0007)	(0.0007)	(0.0007)	(0.0007)
Constant	0.0449***	0.0487***	0.0381***		
	(0.0018)	(0.0021)	(0.0068)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	208,702	208,702	208,702	208,702	208,702
R^2	0.0004	0.0006	0.0112	0.2511	0.2737

Note: The unit of observation is an investor × stock × day. The samples is restricted to sell days. We include only quarters in which the stocks have not increased in price (regarding the first observation of the quarter) and have not changed the left most digit at least once during the quarter. Regressions fit an intercept for the change in the left most digit at X0 and two slopes for the left (with values in the range -3 to 0, corresponding to X6 to X9) and right (with values in the range 0 to 5, corresponding to Y0 to Y5) values. The constant shows the probability to sell the stock at when the second digit is 9 (X9). The second digit over threshold dummy shows the jump in probability when the first digit changes and so the second digit becomes 0 (X0). SE are clustered by account.

Table A8: Price Increasing Subsamples with Equal Prices Bins, Sell Days

Panel (A): Price = £0.11 to £1.01

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0083***	0.0099***	0.0084***	0.0064**	0.0061**
	(0.0021)	(0.0031)	(0.0031)	(0.0030)	(0.0030)
Stock Digits Y0 to Y5		0.0007	0.0009	0.0002	-0.0001
		(0.0008)	(0.0008)	(0.0007)	(0.0008)
Stock Digits X6 to X9		-0.0023*	-0.0016	-0.0012	-0.0017
		(0.0013)	(0.0013)	(0.0013)	(0.0013)
Constant	0.0474***	0.0444***	0.0714***		
	(0.0033)	(0.0039)	(0.0193)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	55,621	55,621	55,621	55,621	55,621
R^2	0.0003	0.0004	0.0196	0.4069	0.4330

Panel (B): Price = £1.01 to £10.1

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0203***	0.0243***	0.0240***	0.0175***	0.0169***
	(0.0018)	(0.0026)	(0.0026)	(0.0024)	(0.0024)
Stock Digits Y0 to Y5		-0.0015**	-0.0016**	-0.0006	-0.0013**
		(0.0006)	(0.0006)	(0.0006)	(0.0006)
Stock Digits X6 to X9		-0.0009	-0.0009	-0.0006	-0.0001
		(0.0009)	(0.0009)	(0.0009)	(0.0010)
Constant	0.0403***	0.0392***	0.0486**		
	(0.0021)	(0.0024)	(0.0189)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	101,164	101,164	101,164	101,164	101,164
R^2	0.0020	0.0021	0.0130	0.3567	0.3792

Panel (C): Price = £11 to £101

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0231***	0.0269***	0.0285***	0.0213***	0.0215***
	(0.0043)	(0.0055)	(0.0057)	(0.0063)	(0.0068)
Stock Digits Y0 to Y5		0.0015	0.0010	0.0026	0.0037
		(0.0020)	(0.0020)	(0.0021)	(0.0023)
Stock Digits X6 to X9		-0.0071**	-0.0087**	-0.0040	-0.0049
		(0.0034)	(0.0034)	(0.0037)	(0.0038)
Constant	0.0431***	0.0371***	-0.0347***		
	(0.0034)	(0.0041)	(0.0061)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	13,891	13,891	13,891	13,891	13,891
R^2	0.0023	0.0027	0.0178	0.5392	0.5676

Table A9: Price Decreasing Subsamples with Equal Prices Bins, Sell Days

Panel (A): Price = £0.10 to £1.00

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	0.0083***	0.0099***	0.0084***	0.0064**	0.0061**
	(0.0021)	(0.0031)	(0.0031)	(0.0030)	(0.0030)
Stock Digits Y0 to Y5		0.0007	0.0009	0.0002	-0.0001
		(0.0008)	(0.0008)	(0.0007)	(0.0008)
Stock Digits X6 to X9		-0.0023*	-0.0016	-0.0012	-0.0017
		(0.0013)	(0.0013)	(0.0013)	(0.0013)
Constant	0.0474***	0.0444***	0.0714***		
	(0.0033)	(0.0039)	(0.0193)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	55,621	55,621	55,621	55,621	55,621
R^2	0.0003	0.0004	0.0196	0.4069	0.4330

Panel (B): Price = £1.00 to £10.0

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0127***	-0.0157***	-0.0164***	-0.0121***	-0.0109***
	(0.0016)	(0.0025)	(0.0024)	(0.0024)	(0.0025)
Stock Digits Y0 to Y5		0.0001	0.0002	0.0012**	0.0008
		(0.0005)	(0.0005)	(0.0005)	(0.0006)
Stock Digits X6 to X9		0.0022**	0.0023**	-0.0004	-0.0001
		(0.0011)	(0.0011)	(0.0010)	(0.0011)
Constant	0.0488***	0.0516***	0.1525**		
	(0.0021)	(0.0027)	(0.0766)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	80,910	80,910	80,910	80,910	80,910
R^2	0.0010	0.0011	0.0113	0.3412	0.3678

Panel (C): Price = £10 to £100

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above Y0 = 1 (in Range Y0 to Y5)	-0.0255***	-0.0240***	-0.0207***	-0.0086	-0.0053
	(0.0053)	(0.0068)	(0.0067)	(0.0074)	(0.0085)
Stock Digits Y0 to Y5		0.0018	0.0026	0.0015	-0.0003
		(0.0019)	(0.0019)	(0.0022)	(0.0026)
Stock Digits X6 to X9		-0.0036	-0.0036	-0.0089*	-0.0095*
		(0.0045)	(0.0045)	(0.0047)	(0.0049)
Constant	0.0657***	0.0625***	-0.0053		
	(0.0053)	(0.0065)	(0.0070)		
Day FE	NO	NO	YES	YES	YES
Industry FE	NO	NO	YES	YES	YES
Account FE	NO	NO	NO	YES	YES
Stock FE	NO	NO	NO	NO	YES
Observations	12,466	12,466	12,466	12,466	12,466
R^2	0.0029	0.0031	0.0212	0.4939	0.5213

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