The Left-Digit Effect and Stock Trading Behavior

Investors are more likely to sell stocks after a change in the left-digit. This occurs for both price increases and decreases. The likelihood of a stock being sold jumps when the price crosses the left-digit from below, e.g. a stock increasing from £9 to £10, and also increases when the price crosses the left-digit from above, e.g. a stock decreasing from £10 to £9. We interpret this as showing that investor attention is drawn to stocks that change their leftmost digit. Left-digit changes are attention grabbing, causing sale activity. This is similar to the rank effect finding of Hartzmark (2012), whereby either top-ranked or bottom-ranked stocks by return since purchase are those most likely to be sold.

To show our result, we draw a sample of stock × quarters that have increased in value through a left-digit in a calendar quarter (e.g. Jan - Mar), which we call the Price Increasing Sample. We then draw a sample of stocks that have decreased in value through a left-digit in a calendar quarter, which we call the Price Decreasing Sample. Note, this sample restriction is at the stock × quarter level.

We then draw all investor × stock × days within the Price Increasing Sample and the Price Decreasing Sample, i.e. all observations for investors × days on which the investor held the stock at the beginning of the day. We look at the probability of sale when the stock is just below a left-digit change, e.g. £9, compared with above the left-digit change, e.g. £10. This exercise might compare investor × stock × days drawn from different investors. Therefore, we also conduct estimates that include individual fixed effects, thereby exploiting within-investor variation in the probability of sale either side of the left-digit change.

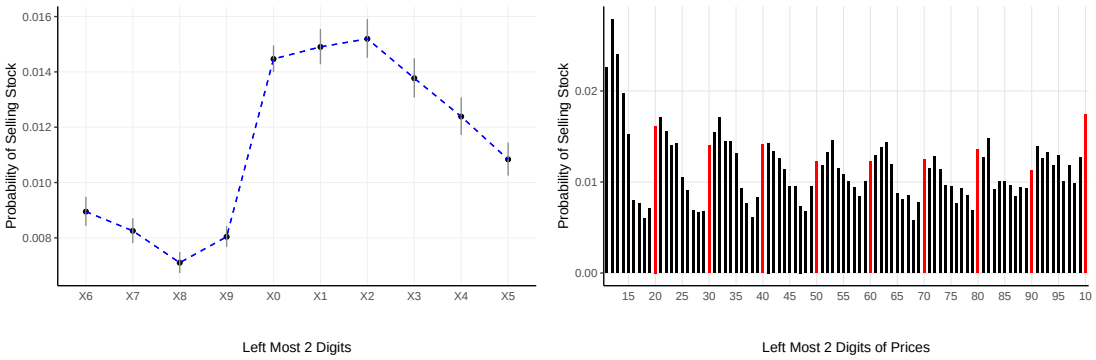
Figure 1 illustrates the main result. Each panel shows the probability of a stock sale by the leftmost two digits of the stock price. Note, this pools over leftmost digits that are in pence, pounds, hundreds of pounds, and so on. The only information used in the analysis is the leftmost two digits, in integer values. The left-side plots pool all observations by the leftmost two digits and the probability of sale together with a 95% confidence interval. The right-side plots show the probability of sale by leftmost two digits. Panel A shows an increase in the probability of sale when the price crosses the left-digit from below, Panel B shows an increase in the probability of sale when the price crosses the left-digit from above. Figure 2 and Figure 3

reproduce these plots for subsamples by the price range of the stock, in Panel A up to £1, in Panel B between £1 and £10, and in Panel C between £10 and £100.

We are confident that this pattern is not due to limit orders, because limit orders placed at left-digit thresholds would execute at that exact digit, thereby generating a spike only at X0. Instead, we see increased probability of sale at a range of digits above XO. This reflects the fact that investors do not continually monitor their accounts, so may only see a movement above X0 at the point in time the digit has increased to X1, X2, or so on.

Figure 1: Leftmost Stock Price Digit and Probability of Sale

(A) Price Increasing



(B) Price Decreasing

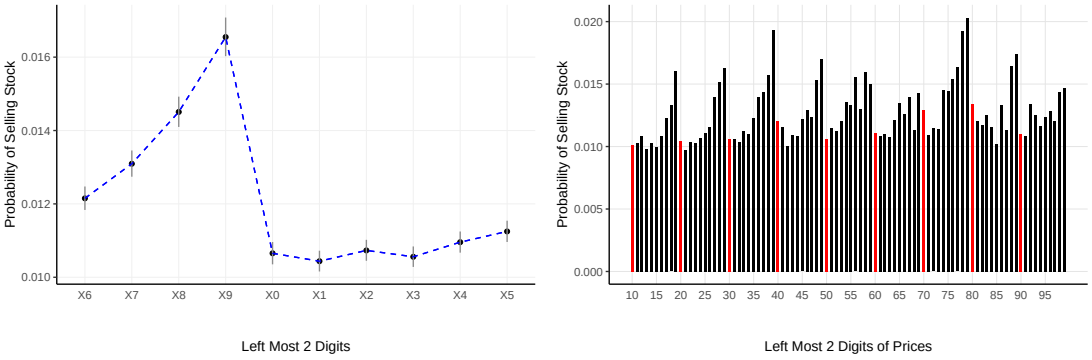
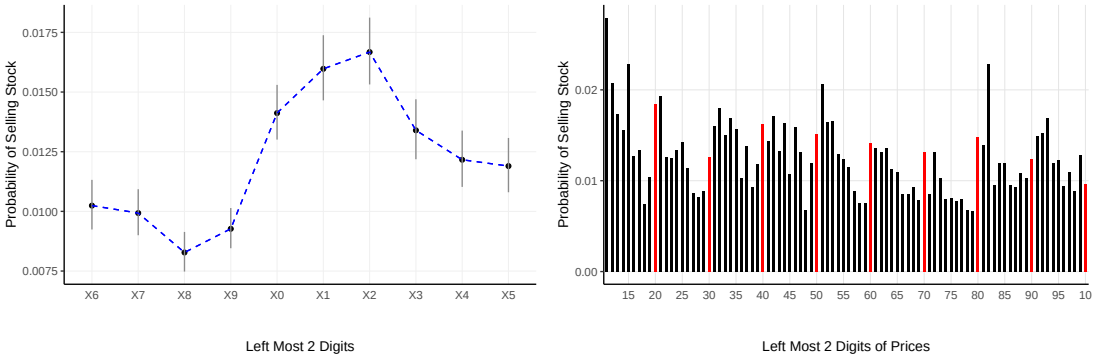
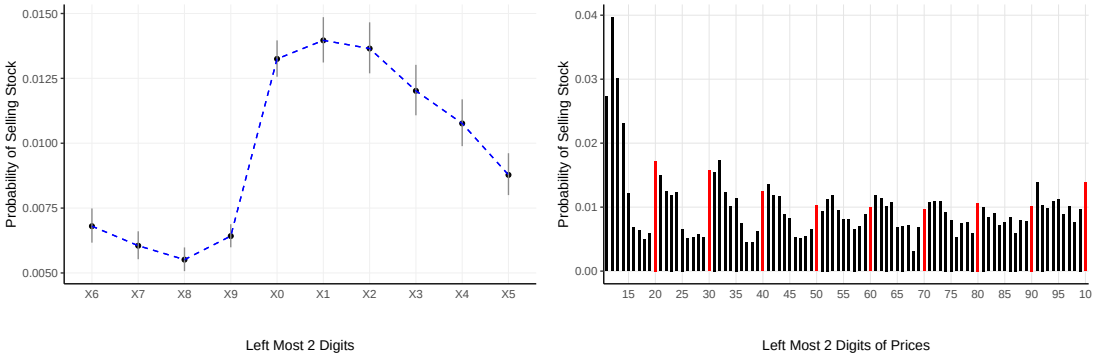


Figure 2: Leftmost Stock Price Digit and Probability of Sale
Prices Increasing Sample by Price Range

(A) Price = £0.11 to £1.01



(B) Price = £1.01 to £10.1



(C) Price = £11 to £101

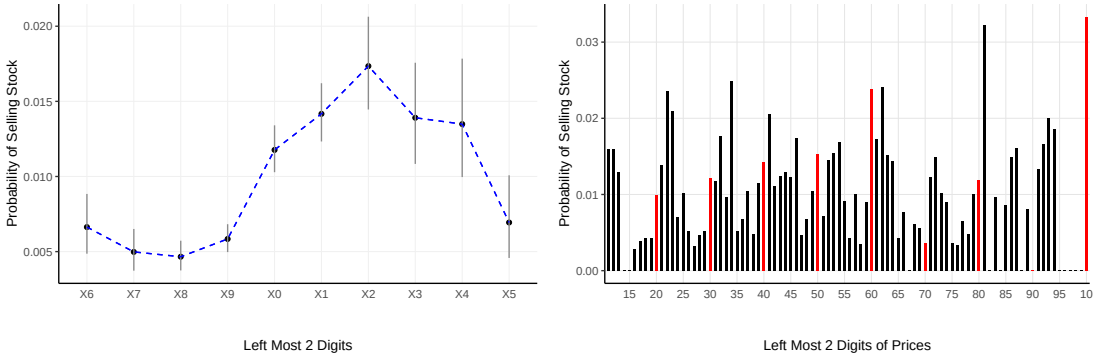
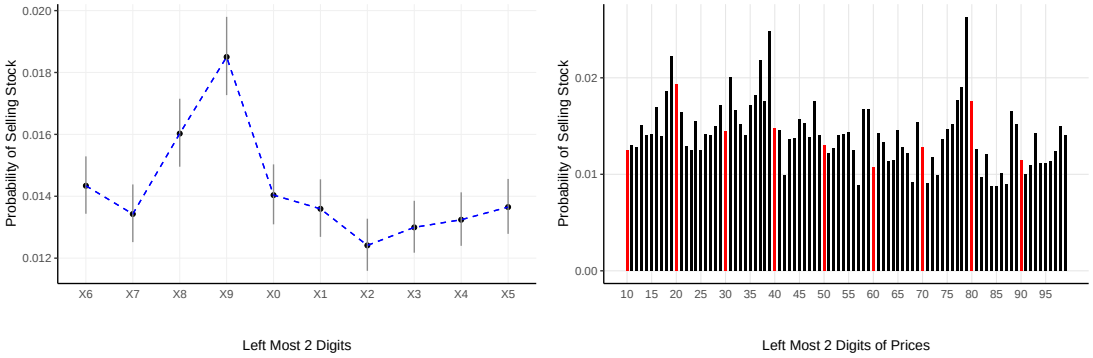
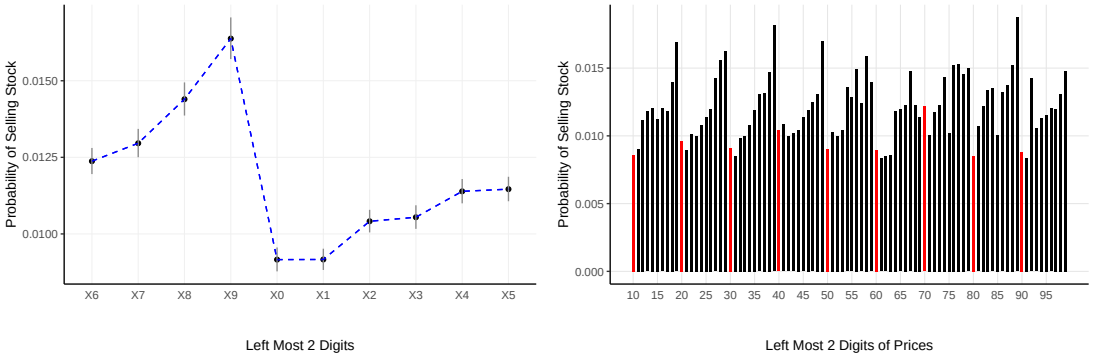


Figure 3: Leftmost Stock Price Digit and Probability of Sale
Prices Decreasing Sample by Price Range

(A) Price = £0.11 to £1.01



(B) Price = £1.01 to £10.1



(C) Price = £11 to £101

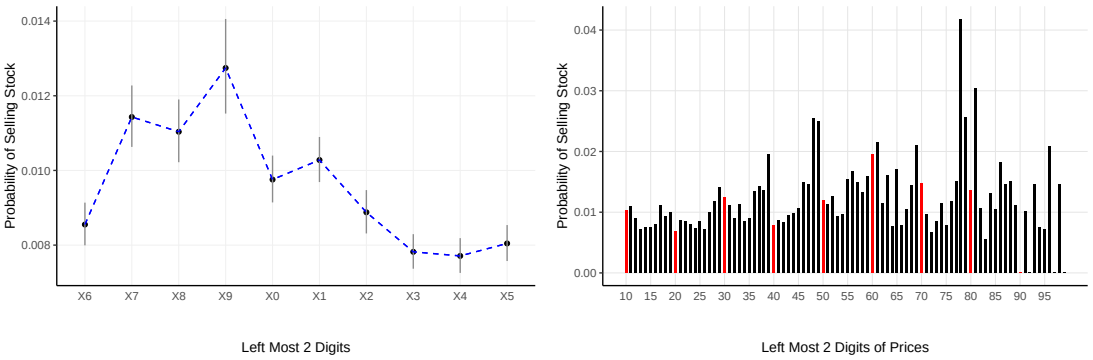


Table 1: Probability of Sale and Left Digit, Price Increasing Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above X0 = 1	0.0058***	0.0076***	0.0070***	0.0067***	0.0070***
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Stock Digits (XO to X5)		-0.0007***	-0.0008***	-0.0008***	-0.0010***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock Digits (X6 to X9)		-0.0003***	-0.0001	-0.0001	0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0080***	0.0076***	0.0098***		
	(0.0003)	(0.0003)	(0.0025)		
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	1,517,823	1,517,823	1,517,823	1,517,823	1,517,823
R^2	0.0008	0.0008	0.0022	0.0511	0.0549

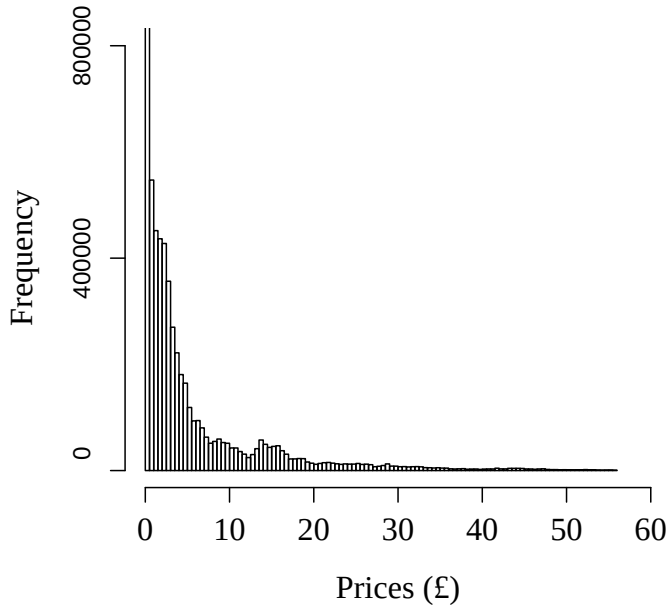
Note: The unit of observation is an investor × stock × day. The samples is restricted to login days. We include only quarters in which the stocks increased in price (regarding the first observation of the quarter) and change the left most digit at least once during the quarter. Only those stocks that 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 (X6 to X9) and right (X0 to X5) values, as described by the raw patterns in **??**. 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 2: Probability of Sale and Left Digit, Price Decreasing Sample

	$Probability\ of\ Sale_{ijt} = 1$				
	(1)	(2)	(3)	(4)	(5)
Above X0 = 1 (in Range X0 to X5)	-0.0029***	-0.0057***	-0.0056***	-0.0054***	-0.0057***
	(0.0001)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Stock Digits (XO to X5)		0.0001***	0.0002***	0.0004***	0.0004***
		(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock Digits (X6 to X9)		0.0014***	0.0013***	0.0011***	0.0011***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.0137***	0.0162***	0.0193***		
	(0.0003)	(0.0004)	(0.0019)		
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	4,376,352	4,376,352	4,376,352	4,376,352	4,376,352
R^2	0.0002	0.0002	0.0009	0.0492	0.0526

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 (X6 to X9) and right (X0 to X5) values, as described by the raw patterns in **??**. 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.

Figure A1: Histogram of Stock Prices



Note: Figure shows the histogram of prices on login days. Outliers in the 99 percentile are excluded.

Table A1: Summary Stats

Panel (A): Baseline Sample

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Price on Login Days £	5,894,175	7.090	27.717	0.000	0.938	2.625	6.990	4,495.251
Price on Sell Days £	349,983	6.247	29.101	0.000	0.645	2.211	5.615	4,443.405
Price of Stocks Sold £	68,103	6.451	40.256	0.000	0.624	2.200	5.400	4,443.405

Panel (B): Price Increasing Sample

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
All Stocks	1,517,823	5.887	31.146	0.000	0.568	2.250	5.992	2,062.035
Stocks with Prices Between £0.11 to £1.01	387,060	0.607	0.246	0.110	0.398	0.655	0.799	1.010
Stocks with Prices Between £1.1 to £10.1	754,649	4.884	2.420	1.100	2.882	4.477	6.745	10.100
Stocks with Prices Between £11 to £101	117,405	33.897	17.368	11.000	20.010	29.580	40.500	100.997

Panel (C): Price Decreasing Sample

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
All Stocks	4,376,352	7.507	26.412	0.000	1.183	2.650	8.270	4,495.251
Stocks with Prices Between £0.10 to £1.0	611,813	0.491	0.277	0.100	0.226	0.472	0.740	1.000
Stocks with Prices Between £1 to £10	2,461,228	3.230	1.998	1.000	1.750	2.602	4.176	10.000
Stocks with Prices Between £10 to £100	978,415	20.993	11.905	10.000	13.725	16.350	24.450	99.990