Left-Digit Bias and Stock Sales

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Abstract

Abstract here

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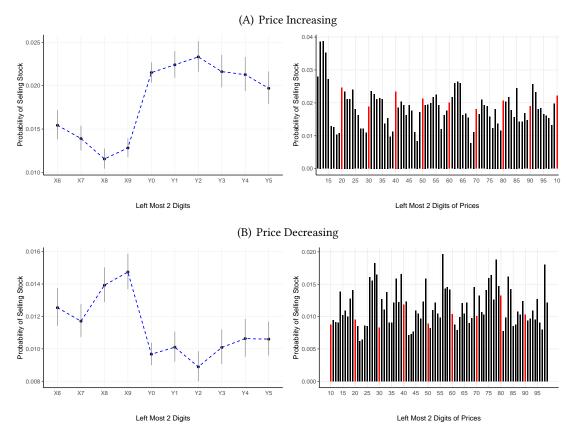
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Figure 1: Leftmost Stock Price Digit and Probability of Sale



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.).

Table 1: Summary Stats

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	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	316,242	5.777	15.384	0.000	0.582	2.433	6.010	2,001.557
Stocks with Prices Between £0.11 to £1.01	82,932	0.588	0.254	0.110	0.378	0.616	0.795	1.010
Stocks with Prices Between £1.1 to £10.1	155,842	4.816	2.367	1.100	2.917	4.348	6.578	10.099
Stocks with Prices Between £11 to £101	25,401	34.166	18.423	11.000	19.931	30.040	46.290	100.690

Panel (C): Price Decreasing Sample

	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
All Stocks	440,805	4.140	24.057	0.000	0.091	0.912	4.490	2,034.661
Stocks with Prices Between £0.10 to £1.0	114,133	0.506	0.276	0.100	0.250	0.479	0.755	1.000
Stocks with Prices Between £1 to £10	181,411	4.575	2.551	1.000	2.256	4.180	6.490	9.999
Stocks with Prices Between £10 to £100	29,721	26.268	16.820	10.000	11.040	21.220	37.450	99.800

Table 2: 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)	0.0086***	0.0101***	0.0096***	0.0107***	0.0116***	
	(0.0005)	(0.0008)	(0.0008)	(0.0008)	(0.0009)	
Stock Digits Y0 to Y5		-0.0003	-0.0007***	-0.0008***	-0.0011***	
		(0.0002)	(0.0002)	(0.0002)	(0.0002)	
Stock Digits X6 to X9		-0.0009***	-0.0003	-0.0003	-0.0001	
		(0.0003)	(0.0003)	(0.0003)	(0.0003)	
Constant	0.0132***	0.0121***	0.0085**			
	(0.0005)	(0.0006)	(0.0033)			
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	316,242	316,242	316,242	316,242	316,242	
\mathbb{R}^2	0.0010	0.0010	0.0046	0.0993	0.1114	

Table 3: 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)	-0.0034***	-0.0050***	-0.0057***	-0.0060***	-0.0064***	
	(0.0004)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	
Stock Digits Y0 to Y5		0.0002	0.0002**	0.0007***	0.0007***	
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	
Stock Digits X6 to X9		0.0009***	0.0010^{***}	0.0006**	0.0007**	
		(0.0003)	(0.0003)	(0.0003)	(0.0003)	
Constant	0.0133***	0.0146***	0.0189***			
	(0.0005)	(0.0006)	(0.0024)			
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	440,805	440,805	440,805	440,805	440,805	
\mathbb{R}^2	0.0002	0.0003	0.0008	0.0852	0.0945	

Table 4: Probability of Sale and Left Digit, Splitting by Median Age

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	Prices Increasing Sample		Prices Decre	asing Sample
	Below Median	Above Median	Below Median	Above Median
Above Y0 = 1 (in Range Y0 to Y5)	0.0128***	0.0107***	-0.0080***	-0.0048***
	(0.0012)	(0.0012)	(0.0009)	(0.0008)
Stock Digits Y0 to Y5	-0.0015***	-0.0008**	0.0009***	0.0006***
	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Stock Digits X6 to X9	0.0001	-0.0005	0.0008*	0.0005
	(0.0005)	(0.0005)	(0.0004)	(0.0004)
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	171,106	145,136	230,074	210,731
R^2	0.1239	0.1044	0.1122	0.0835

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

	Prices Increasing Sample		Prices Decre	easing Sample
	Female	Male	Female	Male
Above Y0 = 1 (in Range Y0 to Y5)	0.0112***	0.0118***	-0.0057***	-0.0066***
	(0.0018)	(0.0010)	(0.0013)	(0.0007)
Stock Digits Y0 to Y5	-0.0010*	-0.0012***	0.0006**	0.0007***
	(0.0005)	(0.0002)	(0.0003)	(0.0001)
Stock Digits X6 to X9	-0.0008	0.0000	0.0001	0.0008**
	(0.0008)	(0.0004)	(0.0006)	(0.0003)
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	51,515	264,727	66,918	373,887
\mathbb{R}^2	0.1259	0.1141	0.1228	0.0944

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

	Prices Increa	asing Sample	Prices Decreasing Sample		
	Below Median	Above Median	Below Median	Above Median	
Above Y0 = 1 (in Range Y0 to Y5)	0.0153***	0.0081***	-0.0082***	-0.0038***	
	(0.0013)	(0.0011)	(0.0009)	(0.0007)	
Stock Digits Y0 to Y5	-0.0016***	-0.0008***	0.0009***	0.0005***	
	(0.0003)	(0.0003)	(0.0002)	(0.0002)	
Stock Digits X6 to X9	0.0001	-0.0005	0.0010**	0.0001	
	(0.0005)	(0.0004)	(0.0004)	(0.0003)	
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	171,087	145,155	248,029	192,776	
\mathbb{R}^2	0.1701	0.0886	0.1445	0.0750	

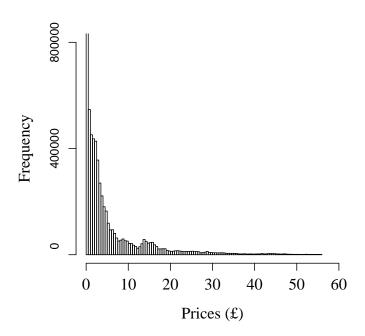
Table 7: Probability of Sale and Left Digit, Splitting by Account Tenure

	Prices Increasing Sample Below Median Above Median		Prices Decre Below Median	asing Sample Above Median
	below Median	Above Median	below Median	Above Median
Above Y0 = 1 (in Range Y0 to Y5)	0.0145***	0.0097***	-0.0079***	-0.0052***
	(0.0012)	(0.0012)	(0.0010)	(0.0008)
Stock Digits Y0 to Y5	-0.0015***	-0.0008**	0.0010***	0.0007***
	(0.0003)	(0.0003)	(0.0002)	(0.0002)
Stock Digits X6 to X9	-0.0003	-0.0001	0.0008*	0.0003
	(0.0005)	(0.0005)	(0.0004)	(0.0003)
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	163,840	152,402	205,653	235,152
R^2	0.1257	0.1469	0.1179	0.1120

Table 8: Probability of Sale and Left Digit, Splitting by Number of Stocks

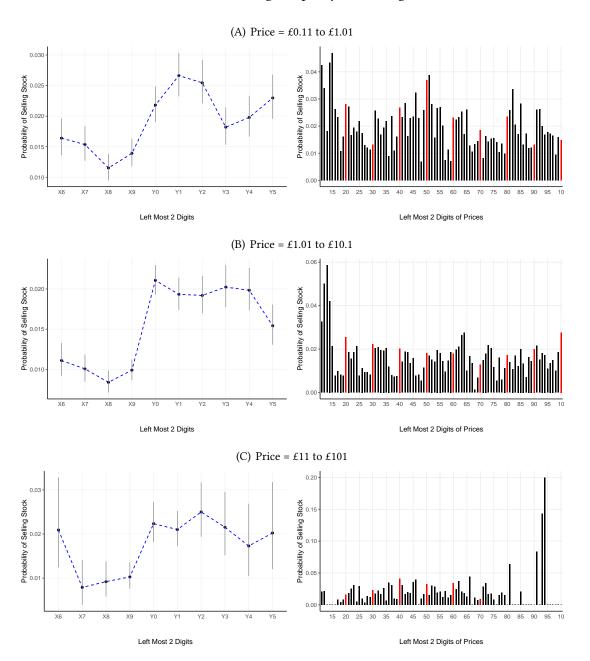
	Prices Increasing Sample			asing Sample
	Below Median	Above Median	Below Median	Above Median
Above Y0 = 1 (in Range Y0 to Y5)	0.0167***	0.0064***	-0.0092***	-0.0034***
	(0.0014)	(0.0009)	(0.0010)	(0.0006)
Stock Digits Y0 to Y5	-0.0016***	-0.0007***	0.0010***	0.0004***
	(0.0003)	(0.0003)	(0.0002)	(0.0001)
Stock Digits X6 to X9	-0.0006	0.0002	0.0010**	0.0003
	(0.0006)	(0.0004)	(0.0004)	(0.0003)
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	174,614	141,628	232,167	208,638
R^2	0.1372	0.0709	0.1175	0.0545

Figure A1: Histogram of Stock Prices



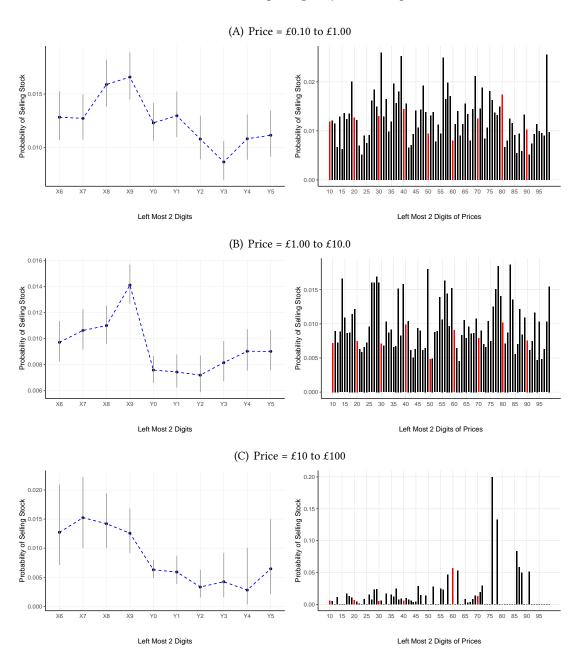
 $\it Note: Figure shows the histogram of prices on login days. Outliers in the 99 percentile are excluded.$

Figure A2: Leftmost Stock Price Digit and Probability of Sale Prices Increasing Sample by Price Range



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 26.22% of the observations in the prices increasing sample; Panel B, to 49.28%; and Panel C, to 8.03%.

Figure A3: Leftmost Stock Price Digit and Probability of Sale Prices Decreasing Sample by Price Range



Note: £Y in the X-axes is equivalent to £X + 1 (e.g., £X9 could include £0.19, £1.9, £1.9, 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 25.89% of the observations in the prices decreasing sample; Panel B, to 41.15%; and Panel C, to 6.74%.

Figure A4: Sample Selection and Simulation Exercise

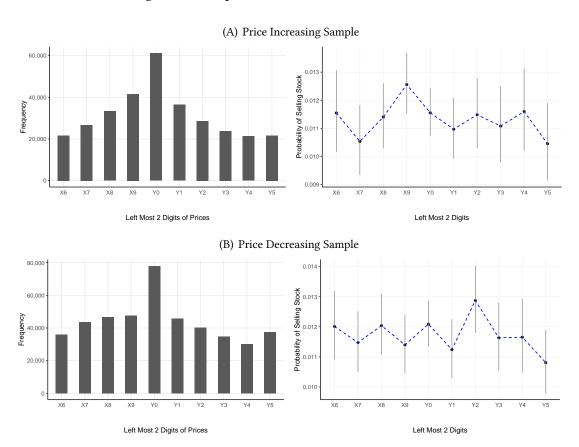
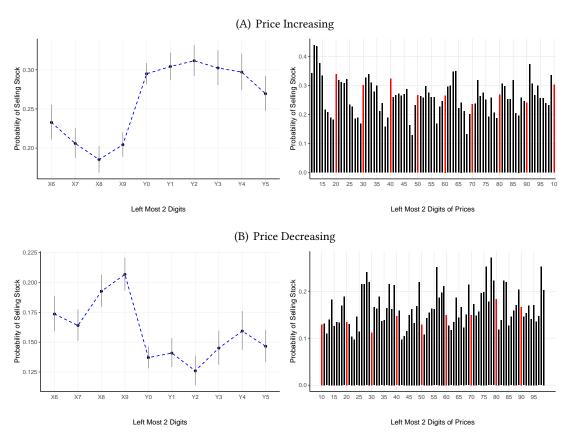
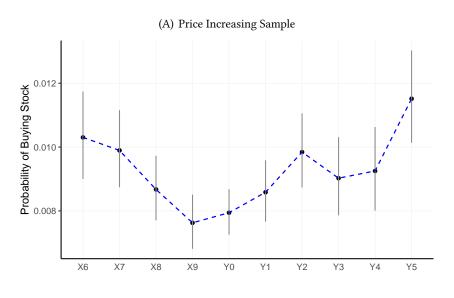


Figure A5: Leftmost Stock Price Digit and Probability of Sale, Sell Days [EQ: sell days results at here the end of the Appendix. But perhaps they should go before Figure A4?]

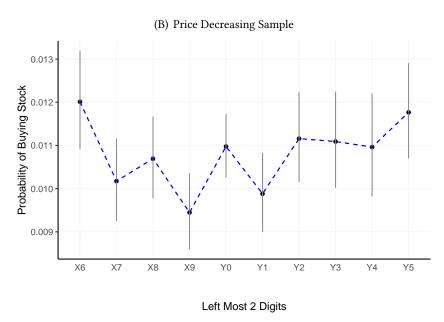


Note: £Y in the X-axes is equivalent to £X + 1 (e.g., £X9 could include £0.19, £1.9, £19, etc., while £Y0 could include £0.20, £2.0, £20, etc.).

Figure A6: Probability of Topping-up [EQ: I remember we talked with George about doing the topping up analysis. Perhaps we could just tell him that the analysis did not work and drop this plot? What do you think? Just in case, I am leaving the plots here for now.]



Left Most 2 Digits



Note: Figure shows the probability of topping up (increasing position in an stock) under the same sample selection. £Y in the X-axes is equivalent to £X + 1 (e.g., £X9 could include £0.19, £1.9, £1.9, etc., while £Y0 could include £0.20, £2.0, £2.0, etc.,).

Table A1: Sample Selection [EQ: we used the sample from our DE paper. So these are new accounts. We can control for returns with this sample in a reviewer suggests us to do so. But the table is a preliminary table. Do you think the sub samples are clear? We need to discuss about how to present the sample exclusions]

	Remaining Accounts
All potential new accounts	33285
Excluding accounts:	
Accounts with transfers-in	29440
Accounts with no single sell record	13785
Accounts with no single login record	13681
Excluding observations (account \times stock \times day):	
Days with fewer than 2 stocks	11104
Outliers in returns (1 and 99 percentiles)	11083
Days with unknown prices	10415
Accounts with an average portfolio value of 0	10367
Accounts with no remaining selling days after the earlier exclusions	8242
Number of Accounts	8242
Number of Observations	5894175
Sub-samples	
Price Increasing Stocks Sample	
Quarters in which stock prices > first price of the quarter and the price changed the leftmost digit at least once	316242
Price Decreasing Stocks Sample	
Quarters in which stock prices < first price of the quarter and the price changed the leftmost digit at least once	440850

Note: The unit of observation is an investor \times stock \times day. Only days in which the investor made a login to their account are included. Sub-samples include stocks and quarters in which prices were increasing (or decreasing) and there was a change in the left most digit of the price of the stock at least once during the quarter. All login days in these quarters are included.

Table A2: 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)	0.0084***	0.0111***	0.0102***	0.0095***	0.0092***	
	(0.0010)	(0.0016)	(0.0016)	(0.0017)	(0.0017)	
Stock Digits Y0 to Y5		-0.0006	-0.0006	-0.0004	-0.0006	
		(0.0004)	(0.0004)	(0.0004)	(0.0004)	
Stock Digits X6 to X9		-0.0010*	-0.0007	-0.0005	-0.0003	
		(0.0006)	(0.0006)	(0.0006)	(0.0007)	
Constant	0.0141***	0.0127***	0.2090***			
	(0.0009)	(0.0011)	(0.0776)			
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	82,932	82,932	82,932	82,932	82,932	
R^2	0.0009	0.0010	0.0051	0.1355	0.1501	

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)	0.0098***	0.0116***	0.0114***	0.0123***	0.0124***	
	(0.0007)	(0.0010)	(0.0010)	(0.0010)	(0.0011)	
Stock Digits Y0 to Y5		-0.0007**	-0.0012***	-0.0008***	-0.0010***	
		(0.0003)	(0.0003)	(0.0003)	(0.0003)	
Stock Digits X6 to X9		-0.0004	0.0001	-0.0003	-0.0001	
		(0.0004)	(0.0004)	(0.0004)	(0.0004)	
Constant	0.0097***	0.0093***	0.0433***			
	(0.0005)	(0.0007)	(0.0041)			
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	155,842	155,842	155,842	155,842	155,842	
\mathbb{R}^2	0.0016	0.0016	0.0058	0.1185	0.1271	

Panel (C): Price = £11 to £101

	$Probability \ of \ Sale_{ijt} = 1$					
	(1)	(2)	(3)	(4)	(5)	
Above Y0 = 1 (in Range Y0 to Y5)	0.0098***	0.0116***	0.0114***	0.0123***	0.0124***	
	(0.0007)	(0.0010)	(0.0010)	(0.0010)	(0.0011)	
Stock Digits Y0 to Y5		-0.0007**	-0.0012***	-0.0008***	-0.0010***	
		(0.0003)	(0.0003)	(0.0003)	(0.0003)	
Stock Digits X6 to X9		-0.0004	0.0001	-0.0003	-0.0001	
		(0.0004)	(0.0004)	(0.0004)	(0.0004)	
Constant	0.0097***	0.0093***	0.0433***			
	(0.0005)	(0.0007)	(0.0041)			
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	155,842	155,842	155,842	155,842	155,842	
\mathbb{R}^2	0.0016	0.0016	0.0058	0.1185	0.1271	

Table A3: 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)	-0.0035***	-0.0045***	-0.0051***	-0.0048***	-0.0052***	
	(0.0008)	(0.0012)	(0.0012)	(0.0012)	(0.0013)	
Stock Digits Y0 to Y5		-0.0004*	-0.0003	0.0001	0.0002	
		(0.0003)	(0.0003)	(0.0003)	(0.0003)	
Stock Digits X6 to X9		0.0015***	0.0015***	0.0011**	0.0012**	
		(0.0005)	(0.0005)	(0.0005)	(0.0005)	
Constant	0.0147***	0.0167***	0.0613**			
	(0.0008)	(0.0011)	(0.0291)			
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	114,133	114,133	114,133	114,133	114,133	
R^2	0.0002	0.0003	0.0015	0.1445	0.1599	

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)	-0.0036***	-0.0062***	-0.0065***	-0.0073***	-0.0072***	
_	(0.0005)	(0.0008)	(0.0008)	(0.0008)	(0.0009)	
Stock Digits Y0 to Y5		0.0003*	0.0004**	0.0011***	0.0010***	
		(0.0002)	(0.0002)	(0.0002)	(0.0002)	
Stock Digits X6 to X9		0.0014***	0.0014***	0.0007**	0.0009**	
		(0.0004)	(0.0004)	(0.0004)	(0.0004)	
Constant	0.0116***	0.0135***	0.0212***			
	(0.0005)	(0.0008)	(0.0021)			
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	181,411	181,411	181,411	181,411	181,411	
\mathbb{R}^2	0.0003	0.0005	0.0010	0.1057	0.1161	

Panel (C): Price = £10 to £100

	$Probability \ of \ Sale_{ijt} = 1$					
	(1)	(2)	(3)	(4)	(5)	
Above Y0 = 1 (in Range Y0 to Y5)	-0.0080***	-0.0070***	-0.0077***	-0.0067***	-0.0067***	
	(0.0014)	(0.0019)	(0.0019)	(0.0022)	(0.0023)	
Stock Digits Y0 to Y5		-0.0006	-0.0002	0.0005	0.0005	
		(0.0004)	(0.0004)	(0.0005)	(0.0005)	
Stock Digits X6 to X9		-0.0004	-0.0006	-0.0020*	-0.0023*	
		(0.0011)	(0.0011)	(0.0012)	(0.0013)	
Constant	0.0136***	0.0131***	0.0181***			
	(0.0014)	(0.0017)	(0.0030)			
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	29,721	29,721	29,721	29,721	29,721	
R^2	0.0017	0.0018	0.0027	0.1536	0.1599	

[EQ: new results using the sell day sample. We use the same quarters but we only include sell days. We replicate the main regressions. Do you think we need to replicate some other tables presented with the login sample?].

Table A4: 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)	0.0926***	0.1089***	0.1092***	0.0871***	0.0814***	
	(0.0074)	(0.0109)	(0.0103)	(0.0109)	(0.0117)	
Stock Digits Y0 to Y5		-0.0029	-0.0060**	-0.0049*	-0.0072**	
		(0.0027)	(0.0026)	(0.0028)	(0.0028)	
Stock Digits X6 to X9		-0.0087**	-0.0054	-0.0028	0.0034	
_		(0.0043)	(0.0042)	(0.0047)	(0.0050)	
Constant	0.2049***	0.1939***	0.1528***			
	(0.0072)	(0.0088)	(0.0438)			
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	22,023	22,023	22,023	22,023	22,023	
\mathbb{R}^2	0.0102	0.0104	0.0239	0.3515	0.4253	

Table A5: 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)	-0.0445***	-0.0690***	-0.0742***	-0.0542***	-0.0526***	
	(0.0051)	(0.0076)	(0.0075)	(0.0079)	(0.0086)	
Stock Digits Y0 to Y5		0.0029*	0.0032**	0.0044***	0.0055***	
		(0.0016)	(0.0016)	(0.0017)	(0.0018)	
Stock Digits X6 to X9		0.0134***	0.0140***	0.0072**	0.0059*	
		(0.0033)	(0.0033)	(0.0033)	(0.0035)	
Constant	0.1854***	0.2041***	0.2340***			
	(0.0094)	(0.0103)	(0.0240)			
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	31,279	31,279	31,279	31,279	31,279	
\mathbb{R}^2	0.0036	0.0043	0.0090	0.3313	0.3904	