Appendix A

EURUSD: day of abnormal price changes

Table A.1: Descriptive statistics for EURUSD data: daily, hourly, days with positive and negative returns

Parameter	**Daily data**	**Positive days**	**Negative days**	**Hourly data**	**Positive days (hourly data)**	**Negative days (hourly data)**
Mean	-0.0001	0.0045	-0.0048	0.0000	0.0002	-0.0002
Standard error	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Median	0.0001	0.0033	-0.0037	0.0000	0.0001	-0.0001
Mode	0	0	0	0	0	0
Std. Dev.	0.0063	0.0043	0.0042	0.0013	0.0013	0.0013
Variance	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Kurtosis	2.2121	7.2611	3.1314	12.8767	13.4662	11.9229
Skewness	0.1424	2.1538	-1.5873	0.0533	1.3152	-1.2367
Minimum	-0.0266	0.0000	-0.0266	-0.0203	-0.0117	-0.0203
Maximum	0.0349	0.0349	0.0000	0.0230	0.0230	0.0114
Sum	-0.2050	6.6299	-6.8349	-0.1479	6.1634	-6.3113
Observations	2883	1459	1426	64992	32891	32125

Figure A.1: Average hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes

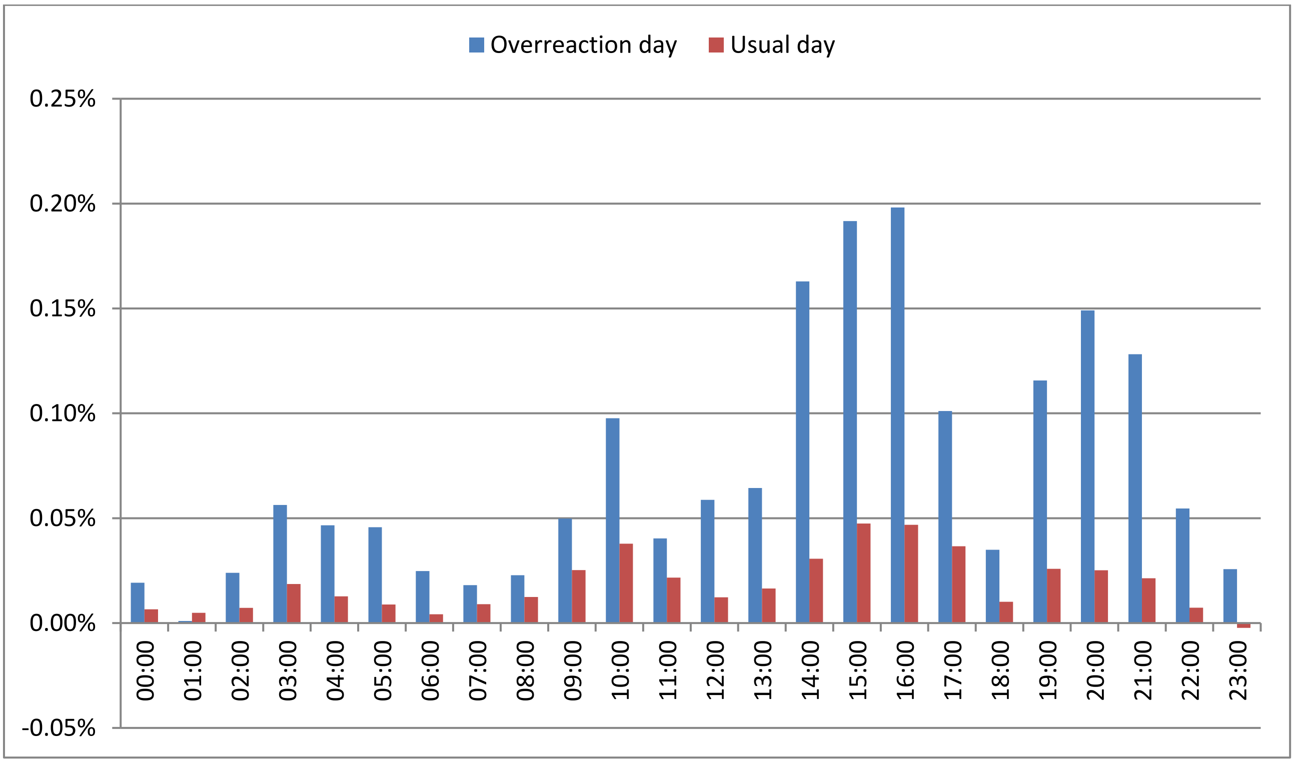


Figure A.2: Average hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes

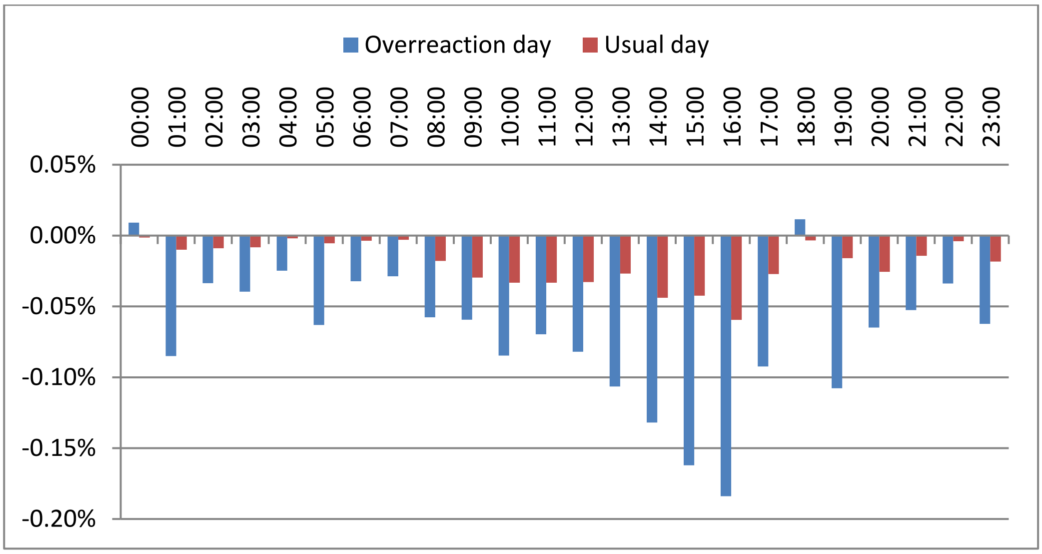


Table A.2: t-test of hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes

Hour	Average return on day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with positive returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	0.0002	0.0012	67	0.0001	0.0008	1400	0.84
1:00	0.0000	0.0014	67	0.0000	0.0009	1400	-0.23
2:00	0.0002	0.0013	67	0.0001	0.0010	1400	1.02
3:00	**0.0006**	**0.0014**	**67**	**0.0002**	**0.0009**	**1400**	**2.24**
4:00	**0.0005**	**0.0015**	**67**	**0.0001**	**0.0009**	**1400**	**1.82**
5:00	**0.0005**	**0.0015**	**67**	**0.0001**	**0.0008**	**1400**	**1.97**
6:00	0.0002	0.0015	67	0.0000	0.0008	1400	1.12
7:00	0.0002	0.0014	67	0.0001	0.0009	1400	0.51
8:00	0.0002	0.0022	67	0.0001	0.0012	1400	0.38
9:00	0.0005	0.0021	67	0.0003	0.0015	1400	0.97
10:00	**0.0010**	**0.0020**	**67**	**0.0004**	**0.0015**	**1400**	**2.38**
11:00	0.0004	0.0018	67	0.0002	0.0014	1400	0.82
12:00	**0.0006**	**0.0016**	**67**	**0.0001**	**0.0012**	**1400**	**2.35**
13:00	**0.0006**	**0.0020**	**67**	**0.0002**	**0.0013**	**1400**	**1.98**
14:00	**0.0016**	**0.0034**	**67**	**0.0003**	**0.0018**	**1400**	**3.18**
15:00	**0.0019**	**0.0036**	**67**	**0.0005**	**0.0020**	**1400**	**3.28**
16:00	**0.0020**	**0.0030**	**67**	**0.0005**	**0.0018**	**1400**	**4.09**
17:00	**0.0010**	**0.0028**	**67**	**0.0004**	**0.0017**	**1400**	**1.84**
18:00	0.0003	0.0024	67	0.0001	0.0013	1400	0.82
19:00	**0.0012**	**0.0036**	**67**	**0.0003**	**0.0014**	**1400**	**2.03**
20:00	**0.0015**	**0.0031**	**67**	**0.0003**	**0.0014**	**1400**	**3.27**
21:00	**0.0013**	**0.0029**	**67**	**0.0002**	**0.0013**	**1400**	**3.01**
22:00	0.0005	0.0024	67	0.0001	0.0009	1400	1.63
23:00	0.0003	0.0014	67	0.0000	0.0006	1400	1.60

Table A.3: t-test of hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes

Hour	Average	Standard	Number of	Average	Standard	Number of	t

	return on day with negative abnormal price changes (OD)	deviation (OD)	observations (OD)	return on usual day with positive returns (UD)	deviation (UD)	observation (UD)	criterion
0:00	0.0001	0.0012	67	0.0000	0.0008	2700	0.70
1:00	**-0.0008**	**0.0017**	**67**	**-0.0001**	**0.0010**	**2700**	**-3.67**
2:00	-0.0003	0.0017	67	-0.0001	0.0011	2700	-1.17
3:00	**-0.0004**	**0.0014**	**67**	**-0.0001**	**0.0009**	**2700**	**-1.80**
4:00	-0.0002	0.0013	67	0.0000	0.0008	2700	-1.43
5:00	**-0.0006**	**0.0026**	**67**	**-0.0001**	**0.0009**	**2700**	**-1.83**
6:00	-0.0003	0.0016	67	0.0000	0.0007	2700	-1.51
7:00	-0.0003	0.0014	67	0.0000	0.0009	2700	-1.54
8:00	-0.0006	0.0022	67	-0.0002	0.0013	2700	-1.45
9:00	-0.0006	0.0032	67	-0.0003	0.0016	2700	-0.76
10:00	-0.0008	0.0030	67	-0.0003	0.0016	2700	-1.38
11:00	-0.0007	0.0019	67	-0.0003	0.0014	2700	-1.58
12:00	**-0.0008**	**0.0018**	**67**	**-0.0003**	**0.0012**	**2700**	**-2.21**
13:00	**-0.0011**	**0.0024**	**67**	**-0.0003**	**0.0013**	**2700**	**-2.70**
14:00	**-0.0013**	**0.0030**	**67**	**-0.0004**	**0.0016**	**2700**	**-2.41**
15:00	**-0.0016**	**0.0033**	**67**	**-0.0004**	**0.0019**	**2700**	**-2.92**
16:00	**-0.0018**	**0.0026**	**67**	**-0.0006**	**0.0018**	**2700**	**-3.91**
17:00	**-0.0009**	**0.0028**	**67**	**-0.0003**	**0.0017**	**2700**	**-1.89**
18:00	0.0001	0.0016	67	0.0000	0.0013	2700	0.76
19:00	**-0.0011**	**0.0019**	**67**	**-0.0002**	**0.0012**	**2700**	**-3.86**
20:00	**-0.0006**	**0.0018**	**67**	**-0.0003**	**0.0013**	**2700**	**-1.80**
21:00	-0.0005	0.0022	67	-0.0001	0.0012	2700	-1.44
22:00	-0.0003	0.0015	67	0.0000	0.0009	2700	-1.59
23:00	**-0.0006**	**0.0013**	**67**	**-0.0002**	**0.0007**	**2700**	**-2.77**

Figure A.2: Dynamics of cumulative abnormal returns

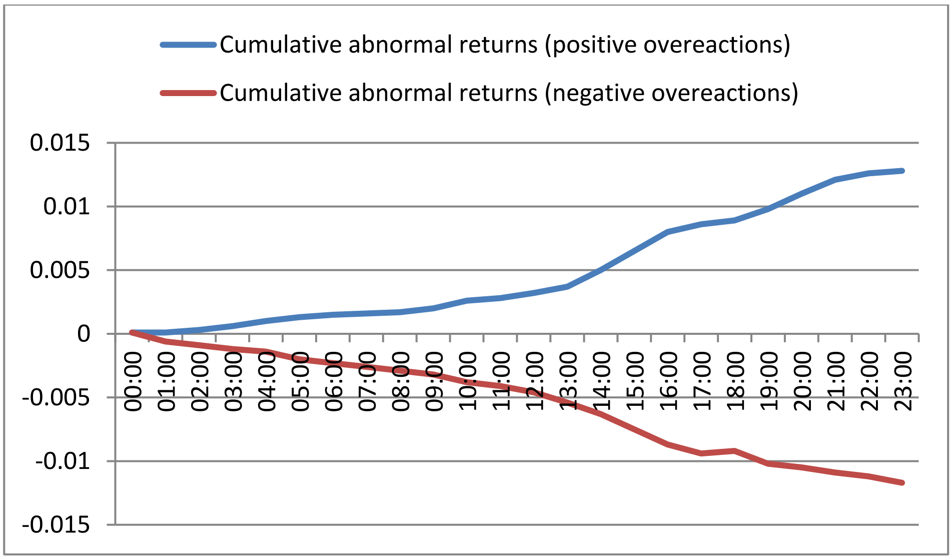


Table A.4: Cumulative abnormal returns: the case of positive and negative abnormal price changes

Hour	Positive abnormal price changes			Negative abnormal price changes		
	Abnormal returns	CAR	Abnormal price change cross	Abnormal returns	CAR	Abnormal price change cross
0:00	0.0001	0.0001	0.0124	0.0001	0.0001	-0.0128
1:00	0.0000	0.0001	0.0124	-0.0008	-0.0006	-0.0120
2:00	0.0002	0.0003	0.0122	-0.0002	-0.0009	-0.0116
3:00	0.0004	0.0006	0.0116	-0.0003	-0.0012	-0.0112
4:00	0.0003	0.0010	0.0111	-0.0002	-0.0014	-0.0110
5:00	0.0004	0.0013	0.0107	-0.0006	-0.0020	-0.0104
6:00	0.0002	0.0015	0.0104	-0.0003	-0.0023	-0.0100
7:00	0.0001	0.0016	0.0102	-0.0003	-0.0026	-0.0097
8:00	0.0001	0.0017	0.0100	-0.0004	-0.0029	-0.0092
9:00	0.0002	0.0020	0.0095	-0.0003	-0.0032	-0.0086
10:00	0.0006	0.0026	0.0085	-0.0005	-0.0038	-0.0077
11:00	0.0002	0.0028	0.0081	-0.0004	-0.0041	-0.0070
12:00	0.0005	0.0032	0.0075	-0.0005	-0.0046	-0.0062
13:00	0.0005	0.0037	0.0069	-0.0008	-0.0054	-0.0051
14:00	0.0013	0.0050	0.0053	-0.0009	-0.0063	-0.0038
15:00	0.0014	0.0065	0.0034	-0.0012	-0.0075	-0.0022
16:00	0.0015	0.0080	0.0014	-0.0012	-0.0087	-0.0004
<u>17:00</u>	0.0006	0.0086	0.0004	**<u>-0.0007</u>**	**<u>-0.0094</u>**	**<u>0.0006</u>**
18:00	0.0002	0.0089	0.0000	0.0002	-0.0092	0.0004
<u>19:00</u>	**<u>0.0009</u>**	**<u>0.0098</u>**	**<u>-0.0011</u>**	-0.0009	-0.0102	0.0015
20:00	0.0012	0.0110	-0.0026	-0.0004	-0.0105	0.0022
21:00	0.0011	0.0121	-0.0039	-0.0004	-0.0109	0.0027
22:00	0.0005	0.0126	-0.0045	-0.0003	-0.0112	0.0030
23:00	0.0003	0.0128	-0.0047	-0.0004	-0.0117	0.0037

Appendix B

EURUSD: day after the day with abnormal price changes

Figure B.1: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes

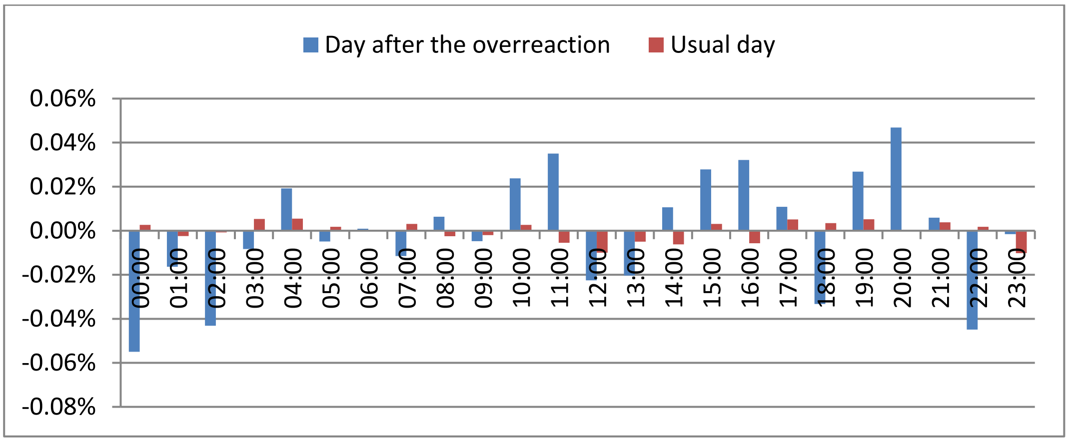


Table B.1: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes

Hour	Average return on day after the day with positive abnormal price changes (OD)	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	**-0.0005**	**0.0020**	**67**	**0.0000**	**0.0008**	**2700**	**-2.41**
1:00	-0.0002	0.0017	67	0.0000	0.0009	2700	-0.68
2:00	**-0.0004**	**0.0014**	**67**	**0.0000**	**0.0010**	**2700**	**-2.39**
3:00	-0.0001	0.0015	67	0.0001	0.0009	2700	-0.76
4:00	0.0002	0.0017	67	0.0001	0.0008	2700	0.66
5:00	0.0000	0.0017	67	0.0000	0.0009	2700	-0.33
6:00	0.0000	0.0012	67	0.0000	0.0008	2700	0.04
7:00	-0.0001	0.0013	67	0.0000	0.0009	2700	-0.90
8:00	0.0001	0.0024	67	0.0000	0.0013	2700	0.30
9:00	0.0000	0.0022	67	0.0000	0.0016	2700	-0.11
10:00	0.0002	0.0028	67	0.0000	0.0016	2700	0.62
11:00	0.0004	0.0023	67	-0.0001	0.0014	2700	1.45
12:00	-0.0002	0.0023	67	-0.0001	0.0012	2700	-0.44
13:00	-0.0002	0.0017	67	0.0000	0.0013	2700	-0.73
14:00	0.0001	0.0029	67	-0.0001	0.0018	2700	0.48
15:00	0.0003	0.0032	67	0.0000	0.0020	2700	0.62
16:00	0.0003	0.0033	67	-0.0001	0.0019	2700	0.94
17:00	0.0001	0.0030	67	0.0001	0.0017	2700	0.16
18:00	-0.0003	0.0017	67	0.0000	0.0013	2700	-1.74
19:00	0.0003	0.0022	67	0.0001	0.0014	2700	0.80
20:00	0.0005	0.0024	67	0.0000	0.0014	2700	1.56
21:00	0.0001	0.0026	67	0.0000	0.0012	2700	0.07
22:00	-0.0004	0.0021	67	0.0000	0.0009	2700	-1.79
23:00	0.0000	0.0010	67	-0.0001	0.0007	2700	0.73

Figure B.2: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes

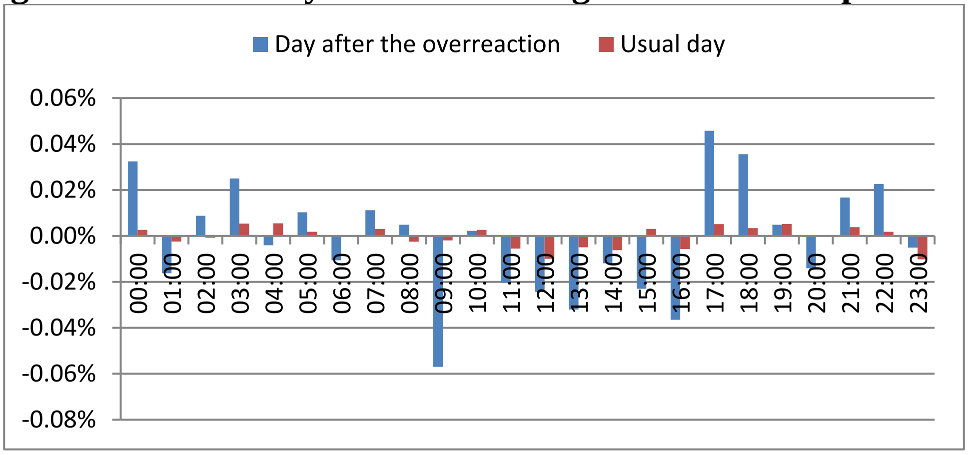


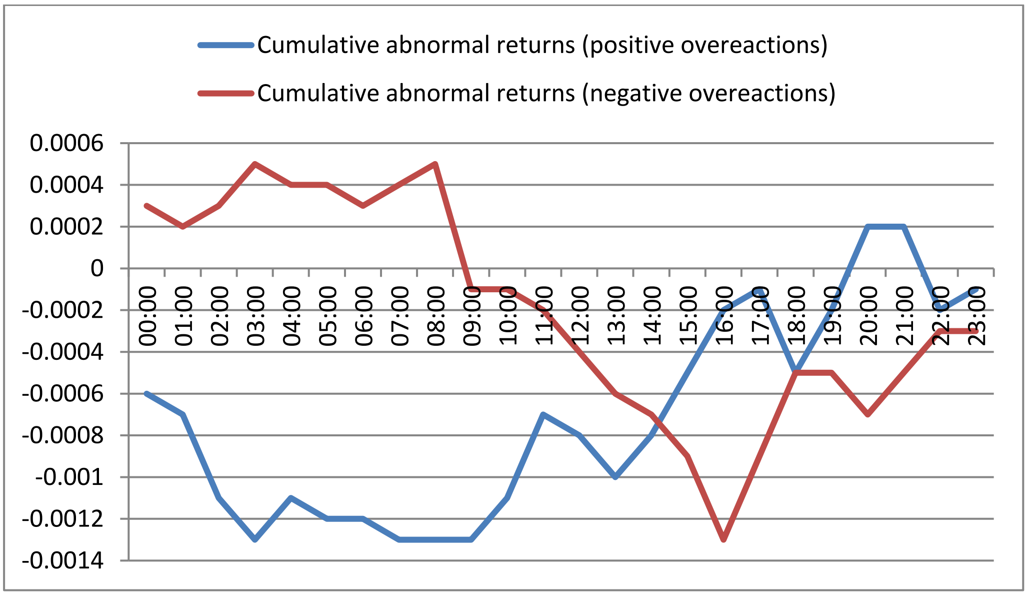
Table B.2: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes

Hour	Average return on day after the day with negative abnormal price changes (OD)	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	**0.0003**	**0.0013**	**67**	**0.0000**	**0.0008**	**2700**	**1.84**
1:00	-0.0002	0.0018	67	0.0000	0.0009	2700	-0.64
2:00	0.0001	0.0017	67	0.0000	0.0010	2700	0.44
3:00	0.0003	0.0014	67	0.0001	0.0009	2700	1.16
4:00	0.0000	0.0017	67	0.0001	0.0008	2700	-0.46
5:00	0.0001	0.0014	67	0.0000	0.0009	2700	0.51
6:00	-0.0001	0.0019	67	0.0000	0.0008	2700	-0.47
7:00	0.0001	0.0015	67	0.0000	0.0009	2700	0.44
8:00	0.0000	0.0023	67	0.0000	0.0013	2700	0.26
9:00	-0.0006	0.0026	67	0.0000	0.0016	2700	-1.70
10:00	0.0000	0.0021	67	0.0000	0.0016	2700	-0.02
11:00	-0.0002	0.0022	67	-0.0001	0.0014	2700	-0.56
12:00	-0.0002	0.0018	67	-0.0001	0.0012	2700	-0.65
13:00	-0.0003	0.0020	67	0.0000	0.0013	2700	-1.08
14:00	-0.0001	0.0026	67	-0.0001	0.0018	2700	-0.18
15:00	-0.0002	0.0026	67	0.0000	0.0020	2700	-0.82
16:00	-0.0004	0.0030	67	-0.0001	0.0019	2700	-0.83
17:00	0.0005	0.0026	67	0.0001	0.0017	2700	1.28
18:00	0.0004	0.0021	67	0.0000	0.0013	2700	1.27
19:00	0.0000	0.0022	67	0.0001	0.0014	2700	-0.01
20:00	-0.0001	0.0020	67	0.0000	0.0014	2700	-0.58
21:00	0.0002	0.0021	67	0.0000	0.0012	2700	0.50
22:00	0.0002	0.0016	67	0.0000	0.0009	2700	1.05
23:00	-0.0001	0.0013	67	-0.0001	0.0007	2700	0.32

Table B.3: Cumulative abnormal returns: the case of positive and negative abnormal price changes

Hour	Positive abnormal price changes		Negative abnormal price changes	
	Abnormal returns	Cumulative abnormal returns	Abnormal returns	Cumulative abnormal returns
0:00	-0.0006	-0.0006	0.0003	0.0003
1:00	-0.0001	-0.0007	-0.0001	0.0002
2:00	-0.0004	-0.0011	0.0001	0.0003
3:00	-0.0001	-0.0013	0.0002	0.0005
4:00	0.0001	-0.0011	-0.0001	0.0004
5:00	-0.0001	-0.0012	0.0001	0.0004
6:00	0.0000	-0.0012	-0.0001	0.0003
7:00	-0.0001	-0.0013	0.0001	0.0004
8:00	0.0001	-0.0013	0.0001	0.0005
9:00	0.0000	-0.0013	-0.0006	-0.0001
10:00	0.0002	-0.0011	0.0000	-0.0001
11:00	0.0004	-0.0007	-0.0001	-0.0002
12:00	-0.0001	-0.0008	-0.0001	-0.0004
13:00	-0.0002	-0.0010	-0.0003	-0.0006
14:00	0.0002	-0.0008	-0.0001	-0.0007
15:00	0.0002	-0.0005	-0.0003	-0.0009
16:00	0.0004	-0.0002	-0.0003	-0.0013
17:00	0.0001	-0.0001	0.0004	-0.0009
18:00	-0.0004	-0.0005	0.0003	-0.0005
19:00	0.0002	-0.0002	0.0000	-0.0005
20:00	0.0005	0.0002	-0.0001	-0.0007
21:00	0.0000	0.0002	0.0001	-0.0005
22:00	-0.0005	-0.0002	0.0002	-0.0003
23:00	0.0001	-0.0001	0.0001	-0.0003

Figure B.3: Dynamics of cumulative abnormal returns



Appendix C

USDJPY: day of abnormal price changes

Table C.1: Descriptive statistics for USDJPY data: daily, hourly, days with positive and negative returns

Parameter	Daily data	Positive days	Negative days	Hourly data	Positive days (hourly data)	Negative days (hourly data)
Mean	0.0000	0.0048	-0.0047	0.0000	0.0002	-0.0002
Standard error	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Median	0.0000	0.0035	-0.0034	0.0000	0.0001	-0.0001
Mode	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Std. Dev.	0.0067	0.0047	0.0048	0.0014	0.0013	0.0014
Variance	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Kurtosis	5.0065	13.9334	9.7566	35.9994	30.9203	39.6193
Skewness	-0.0230	2.6508	-2.5004	-0.6223	1.7519	-2.4414
Minimum	-0.0377	0.0000	-0.0377	-0.0303	-0.0145	-0.0303
Maximum	0.0535	0.0535	0.0000	0.0349	0.0349	0.0166
Sum	0.0632	6.7060	-6.6428	0.0539	6.2795	-6.2222
Observations	2822	1410	1417	64992	32543	32576

Figure C.1: Average hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes, USDJPY

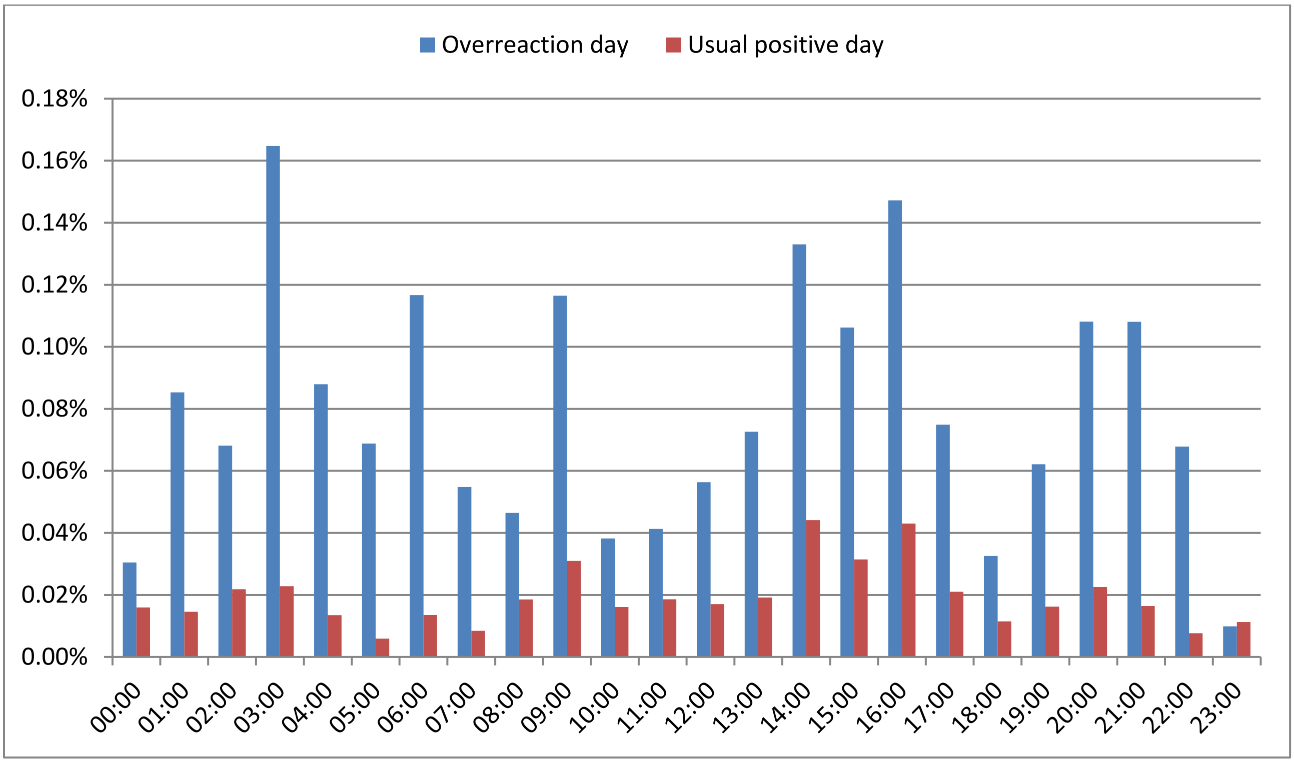


Figure C.2: Average hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, USDJPY

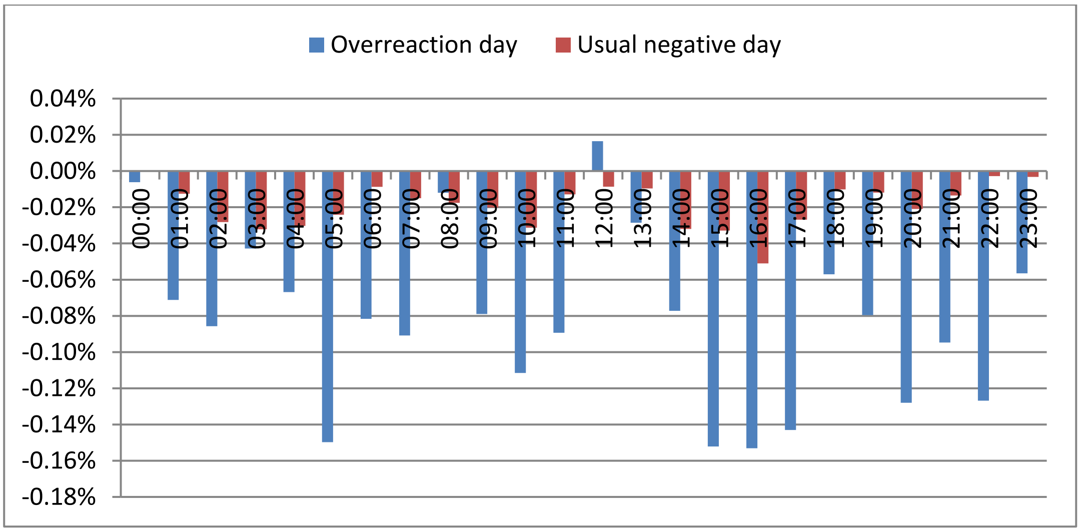


Table C.2: t-test of hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes, USDJPY

Hour	Average return on day with positive abnormal	Standard deviation	Number of observations (OD)	Average return on usual day with positive	Standard deviation (UD)	Number of observation (UD)	t criterion

	price changes			returns (UD)			
0:00	0.0003	0.0015	58	0.0002	0.0010	2500	0.75
1:00	0.0009	0.0033	58	0.0001	0.0014	2500	1.63
2:00	**0.0007**	**0.0020**	**58**	**0.0002**	**0.0013**	**2500**	**1.78**
3:00	**0.0016**	**0.0054**	**58**	**0.0002**	**0.0017**	**2500**	**2.01**
4:00	**0.0009**	**0.0022**	**58**	**0.0001**	**0.0012**	**2500**	**2.62**
5:00	**0.0007**	**0.0024**	**58**	**0.0001**	**0.0011**	**2500**	**2.00**
6:00	**0.0012**	**0.0031**	**58**	**0.0001**	**0.0011**	**2500**	**2.52**
7:00	**0.0005**	**0.0018**	**58**	**0.0001**	**0.0010**	**2500**	**1.92**
8:00	0.0005	0.0024	58	0.0002	0.0013	2500	0.90
9:00	**0.0012**	**0.0024**	**58**	**0.0003**	**0.0015**	**2500**	**2.65**
10:00	0.0004	0.0022	58	0.0002	0.0012	2500	0.75
11:00	0.0004	0.0024	58	0.0002	0.0012	2500	0.71
12:00	0.0006	0.0018	58	0.0002	0.0010	2500	1.69
13:00	**0.0007**	**0.0020**	**58**	**0.0002**	**0.0011**	**2500**	**2.06**
14:00	**0.0013**	**0.0035**	**58**	**0.0004**	**0.0017**	**2500**	**1.92**
15:00	**0.0011**	**0.0028**	**58**	**0.0003**	**0.0016**	**2500**	**2.02**
16:00	**0.0015**	**0.0029**	**58**	**0.0004**	**0.0017**	**2500**	**2.74**
17:00	**0.0007**	**0.0022**	**58**	**0.0002**	**0.0015**	**2500**	**1.83**
18:00	0.0003	0.0020	58	0.0001	0.0012	2500	0.80
19:00	0.0006	0.0028	58	0.0002	0.0013	2500	1.26
20:00	**0.0011**	**0.0019**	**58**	**0.0002**	**0.0012**	**2500**	**3.39**
21:00	**0.0011**	**0.0033**	**58**	**0.0002**	**0.0012**	**2500**	**2.13**
22:00	**0.0007**	**0.0025**	**58**	**0.0001**	**0.0010**	**2500**	**1.84**
23:00	0.0001	0.0022	58	0.0001	0.0008	2500	-0.05

Table C.3: t-test of hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, USDJPY

Hour	Average return on day with positive abnormal price changes (OD)	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with positive returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	-0.0001	0.0016	58	0.0000	0.0011	2500	-0.28
1:00	**-0.0007**	**0.0019**	**58**	**-0.0001**	**0.0012**	**2500**	**-2.40**
2:00	**-0.0009**	**0.0026**	**58**	**-0.0003**	**0.0014**	**2500**	**-1.70**
3:00	-0.0004	0.0017	58	-0.0003	0.0012	2500	-0.49
4:00	**-0.0007**	**0.0016**	**58**	**-0.0003**	**0.0011**	**2500**	**-1.68**
5:00	**-0.0015**	**0.0042**	**58**	**-0.0002**	**0.0014**	**2500**	**-2.27**
6:00	-0.0008	0.0036	58	-0.0001	0.0012	2500	-1.55
7:00	**-0.0009**	**0.0030**	**58**	**-0.0002**	**0.0012**	**2500**	**-1.91**
8:00	-0.0001	0.0021	58	-0.0002	0.0012	2500	0.20
9:00	**-0.0008**	**0.0022**	**58**	**-0.0002**	**0.0014**	**2500**	**-2.03**
10:00	-0.0011	0.0037	58	-0.0003	0.0015	2500	-1.66
11:00	**-0.0009**	**0.0033**	**58**	**-0.0001**	**0.0013**	**2500**	**-1.77**
12:00	0.0002	0.0026	58	-0.0001	0.0012	2500	0.73
13:00	-0.0003	0.0022	58	-0.0001	0.0012	2500	-0.65
14:00	-0.0008	0.0029	58	-0.0003	0.0017	2500	-1.18

15:00	**-0.0015**	**0.0030**	**58**	**-0.0003**	**0.0017**	**2500**	**-2.98**
16:00	**-0.0015**	**0.0037**	**58**	**-0.0005**	**0.0020**	**2500**	**-2.08**
17:00	**-0.0014**	**0.0043**	**58**	**-0.0003**	**0.0018**	**2500**	**-2.06**
18:00	-0.0006	0.0028	58	-0.0001	0.0013	2500	-1.29
19:00	-0.0008	0.0036	58	-0.0001	0.0014	2500	-1.41
20:00	**-0.0013**	**0.0047**	**58**	**-0.0002**	**0.0016**	**2500**	**-1.72**
21:00	**-0.0009**	**0.0036**	**58**	**-0.0001**	**0.0014**	**2500**	**-1.70**
22:00	**-0.0013**	**0.0042**	**58**	**0.0000**	**0.0013**	**2500**	**-2.25**
23:00	-0.0006	0.0039	58	0.0000	0.0012	2500	-1.03

Figure C.3: Dynamics of cumulative abnormal returns, USDJPY

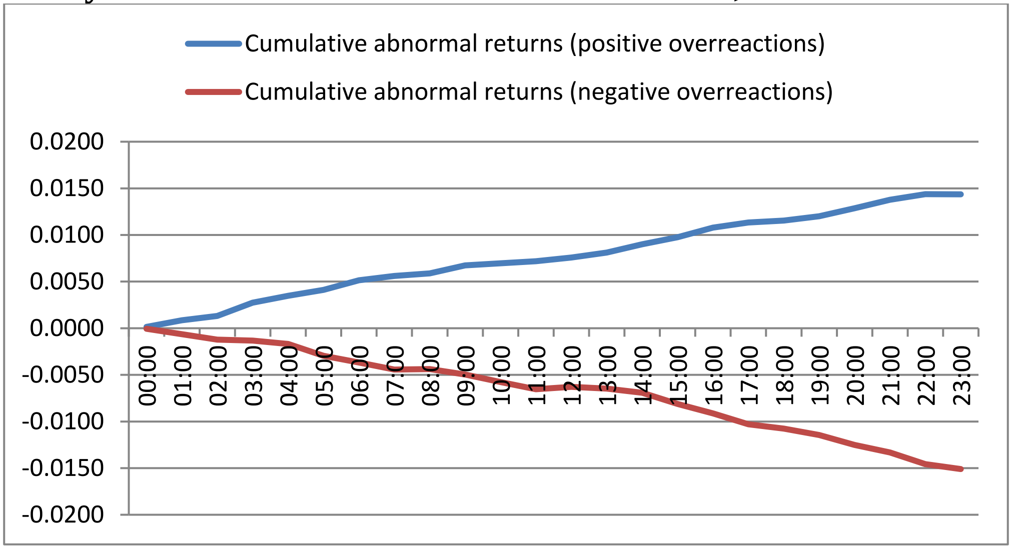


Table C.4: Cumulative abnormal returns: the case of positive and negative abnormal price changes, USDJPY

Hour	Positive abnormal price changes			Negative abnormal price changes		
	Abnormal returns	Cumulative abnormal returns	Abnormal price change cross	Abnormal returns	Cumulative abnormal returns	Abnormal price change cross
0:00	0.0001	0.0001	0.0131	-0.0001	-0.0001	-0.0133
1:00	0.0007	0.0009	0.0122	-0.0006	-0.0006	-0.0126
2:00	0.0005	0.0013	0.0116	-0.0006	-0.0012	-0.0118
3:00	0.0014	0.0027	0.0099	-0.0001	-0.0013	-0.0113
4:00	0.0007	0.0035	0.0090	-0.0004	-0.0017	-0.0107
5:00	0.0006	0.0041	0.0083	-0.0013	-0.0029	-0.0092
6:00	0.0010	0.0051	0.0072	-0.0007	-0.0037	-0.0084
7:00	0.0005	0.0056	0.0066	-0.0008	-0.0044	-0.0075
8:00	0.0003	0.0059	0.0062	0.0001	-0.0044	-0.0073
9:00	0.0009	0.0067	0.0050	-0.0006	-0.0050	-0.0065
10:00	0.0002	0.0070	0.0046	-0.0008	-0.0058	-0.0054
11:00	0.0002	0.0072	0.0042	-0.0008	-0.0065	-0.0045
12:00	0.0004	0.0076	0.0036	0.0003	-0.0063	-0.0047
13:00	0.0005	0.0081	0.0029	-0.0002	-0.0065	-0.0044
14:00	0.0009	0.0090	0.0016	-0.0005	-0.0069	-0.0036
15:00	0.0007	0.0098	**0.0005**	-0.0012	-0.0081	-0.0021
16:00	0.0010	0.0108	**-0.0009**	-0.0010	-0.0091	**-0.0006**
17:00	0.0005	0.0113	-0.0017	-0.0012	-0.0103	**0.0008**
18:00	0.0002	0.0115	-0.0020	-0.0005	-0.0108	0.0014
19:00	0.0005	0.0120	-0.0026	-0.0007	-0.0114	0.0022
20:00	0.0009	0.0129	-0.0037	-0.0011	-0.0125	0.0035
21:00	0.0009	0.0138	-0.0048	-0.0008	-0.0133	0.0044
22:00	0.0006	0.0144	-0.0055	-0.0012	-0.0146	0.0057
23:00	0.0000	0.0144	-0.0056	-0.0005	-0.0151	0.0063

Appendix D

USDJPY: day after the day with abnormal price changes

Figure D.1: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, USDJPY

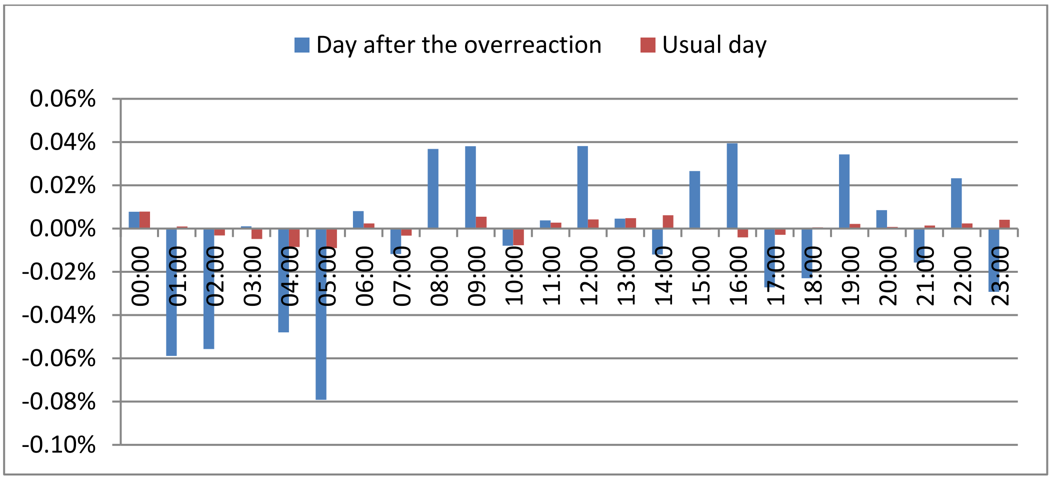


Table D.1: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, USDJPY

Hour	Average return on day after positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	0.0001	0.0014	58	0.0001	0.0011	2500	-0.01
1:00	**-0.0006**	**0.0021**	**58**	**0.0000**	**0.0013**	**2500**	**-2.17**
2:00	-0.0006	0.0024	58	0.0000	0.0013	2500	-1.65
3:00	0.0000	0.0016	58	0.0000	0.0015	2500	0.28
4:00	**-0.0005**	**0.0015**	**58**	**-0.0001**	**0.0012**	**2500**	**-2.05**
5:00	-0.0008	0.0041	58	-0.0001	0.0013	2500	-1.31
6:00	0.0001	0.0017	58	0.0000	0.0012	2500	0.25
7:00	-0.0001	0.0014	58	0.0000	0.0011	2500	-0.46
8:00	0.0004	0.0021	58	0.0000	0.0013	2500	1.35
9:00	0.0004	0.0020	58	0.0001	0.0015	2500	1.25
10:00	-0.0001	0.0018	58	-0.0001	0.0014	2500	-0.01
11:00	0.0000	0.0018	58	0.0000	0.0013	2500	0.04
12:00	0.0004	0.0016	58	0.0000	0.0011	2500	1.59
13:00	0.0000	0.0020	58	0.0000	0.0011	2500	-0.01
14:00	-0.0001	0.0026	58	0.0001	0.0018	2500	-0.54
15:00	0.0003	0.0024	58	0.0000	0.0017	2500	0.85
16:00	0.0004	0.0024	58	0.0000	0.0019	2500	1.36
17:00	-0.0003	0.0020	58	0.0000	0.0016	2500	-0.93
18:00	-0.0002	0.0017	58	0.0000	0.0012	2500	-1.05
19:00	0.0003	0.0015	58	0.0000	0.0013	2500	1.63
20:00	0.0001	0.0019	58	0.0000	0.0015	2500	0.32
21:00	-0.0002	0.0014	58	0.0000	0.0013	2500	-0.90
22:00	0.0002	0.0015	58	0.0000	0.0011	2500	1.03
23:00	**-0.0003**	**0.0011**	**58**	**0.0000**	**0.0010**	**2500**	**-2.28**

Figure D.2: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, USDJPY

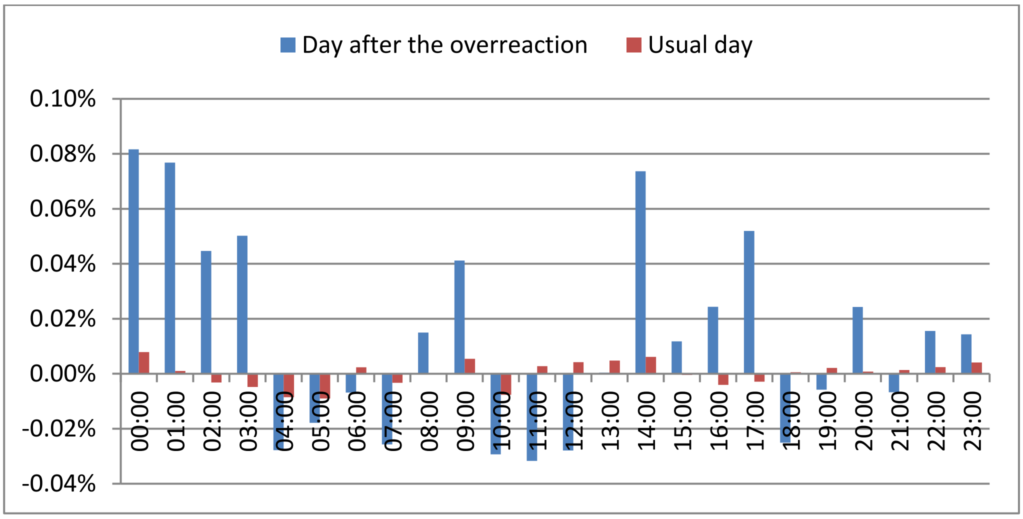


Table D.2: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, USDJPY

Hour	Average return on day after negative abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	**0.0008**	**0.0024**	**58**	**0.0001**	**0.0011**	**2500**	**2.31**
1:00	**0.0008**	**0.0029**	**58**	**0.0000**	**0.0013**	**2500**	**2.01**
2:00	0.0004	0.0025	58	0.0000	0.0013	2500	1.44
3:00	**0.0005**	**0.0020**	**58**	**0.0000**	**0.0015**	**2500**	**2.05**
4:00	-0.0003	0.0029	58	-0.0001	0.0012	2500	-0.51
5:00	-0.0002	0.0027	58	-0.0001	0.0013	2500	-0.25
6:00	-0.0001	0.0022	58	0.0000	0.0012	2500	-0.32
7:00	-0.0003	0.0019	58	0.0000	0.0011	2500	-0.88
8:00	0.0001	0.0023	58	0.0000	0.0013	2500	0.49
9:00	0.0004	0.0024	58	0.0001	0.0015	2500	1.11
10:00	-0.0003	0.0027	58	-0.0001	0.0014	2500	-0.60
11:00	-0.0003	0.0023	58	0.0000	0.0013	2500	-1.15
12:00	-0.0003	0.0024	58	0.0000	0.0011	2500	-1.01
13:00	0.0000	0.0019	58	0.0000	0.0011	2500	-0.18
14:00	**0.0007**	**0.0023**	**58**	**0.0001**	**0.0018**	**2500**	**2.25**
15:00	0.0001	0.0032	58	0.0000	0.0017	2500	0.29
16:00	0.0002	0.0038	58	0.0000	0.0019	2500	0.57
17:00	0.0005	0.0024	58	0.0000	0.0016	2500	1.72
18:00	-0.0003	0.0022	58	0.0000	0.0012	2500	-0.89
19:00	-0.0001	0.0020	58	0.0000	0.0013	2500	-0.30
20:00	0.0002	0.0023	58	0.0000	0.0015	2500	0.78
21:00	-0.0001	0.0033	58	0.0000	0.0013	2500	-0.19
22:00	0.0002	0.0019	58	0.0000	0.0011	2500	0.52
23:00	0.0001	0.0018	58	0.0000	0.0010	2500	0.44

Figure D.3: Dynamics of cumulative abnormal returns, USDJPY

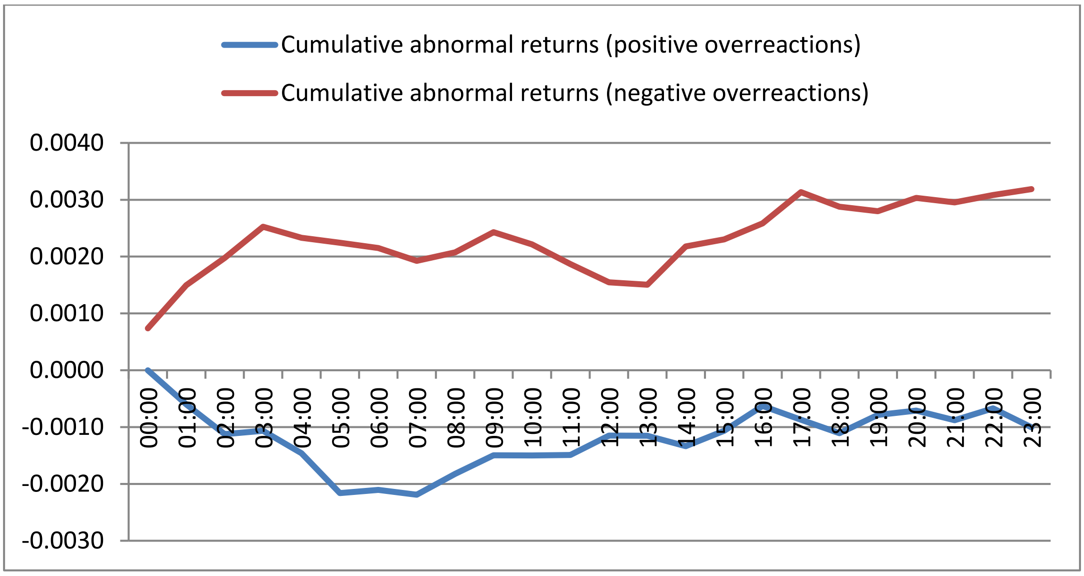


Table D.3: Cumulative abnormal returns: the case of positive and negative abnormal price changes, USDJPY

Hour	Positive abnormal price changes		Negative abnormal price changes	
	Abnormal returns	Cumulative abnormal returns	Abnormal returns	Cumulative abnormal returns
0:00	0.0000	0.0000	0.0007	0.0007
1:00	-0.0006	-0.0006	0.0008	0.0015
2:00	-0.0005	-0.0011	0.0005	0.0020
3:00	0.0001	-0.0011	0.0005	0.0025
4:00	-0.0004	-0.0015	-0.0002	0.0023
5:00	-0.0007	-0.0022	-0.0001	0.0022
6:00	0.0001	-0.0021	-0.0001	0.0022
7:00	-0.0001	-0.0022	-0.0002	0.0019
8:00	0.0004	-0.0018	0.0001	0.0021
9:00	0.0003	-0.0015	0.0004	0.0024
10:00	0.0000	-0.0015	-0.0002	0.0022
11:00	0.0000	-0.0015	-0.0003	0.0019
12:00	0.0003	-0.0012	-0.0003	0.0015
13:00	0.0000	-0.0012	0.0000	0.0015
14:00	-0.0002	-0.0013	0.0007	0.0022
15:00	0.0003	-0.0011	0.0001	0.0023
16:00	0.0004	-0.0006	0.0003	0.0026
17:00	-0.0002	-0.0009	0.0005	0.0031
18:00	-0.0002	-0.0011	-0.0003	0.0029
19:00	0.0003	-0.0008	-0.0001	0.0028
20:00	0.0001	-0.0007	0.0002	0.0030
21:00	-0.0002	-0.0009	-0.0001	0.0030
22:00	0.0002	-0.0007	0.0001	0.0031
23:00	-0.0003	-0.0010	0.0001	0.0032

Appendix E

USDCAD: day of abnormal price changes

Table E.1: Descriptive statistics for USDCAD data: daily, hourly, days with positive and negative returns

Parameter	**Daily data**	**Positive days**	**Negative days**	**Hourly data**	**Positive days (hourly data)**	**Negative days (hourly data)**
Mean	0.0001	0.0045	-0.0044	0.0000	0.0002	-0.0002
Standard error	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Median	0.0001	0.0033	-0.0034	0.0000	0.0001	-0.0001
Mode	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Std. Dev.	0.0062	0.0044	0.0041	0.0013	0.0013	0.0013
Variance	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Kurtosis	3.1043	7.2564	6.8753	14.0036	11.7443	16.0283
Skewness	0.2055	2.2245	-2.0031	-0.1849	1.0196	-1.4095
Minimum	-0.0379	0.0000	-0.0379	-0.0220	-0.0171	-0.0220
Maximum	0.0349	0.0349	0.0000	0.0184	0.0184	0.0117
Sum	0.3434	6.4674	-6.1239	0.3585	6.1704	-5.8119
Observations	2808	1427	1389	65000	32920	32223

Figure E.1: Average hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes, USDCAD

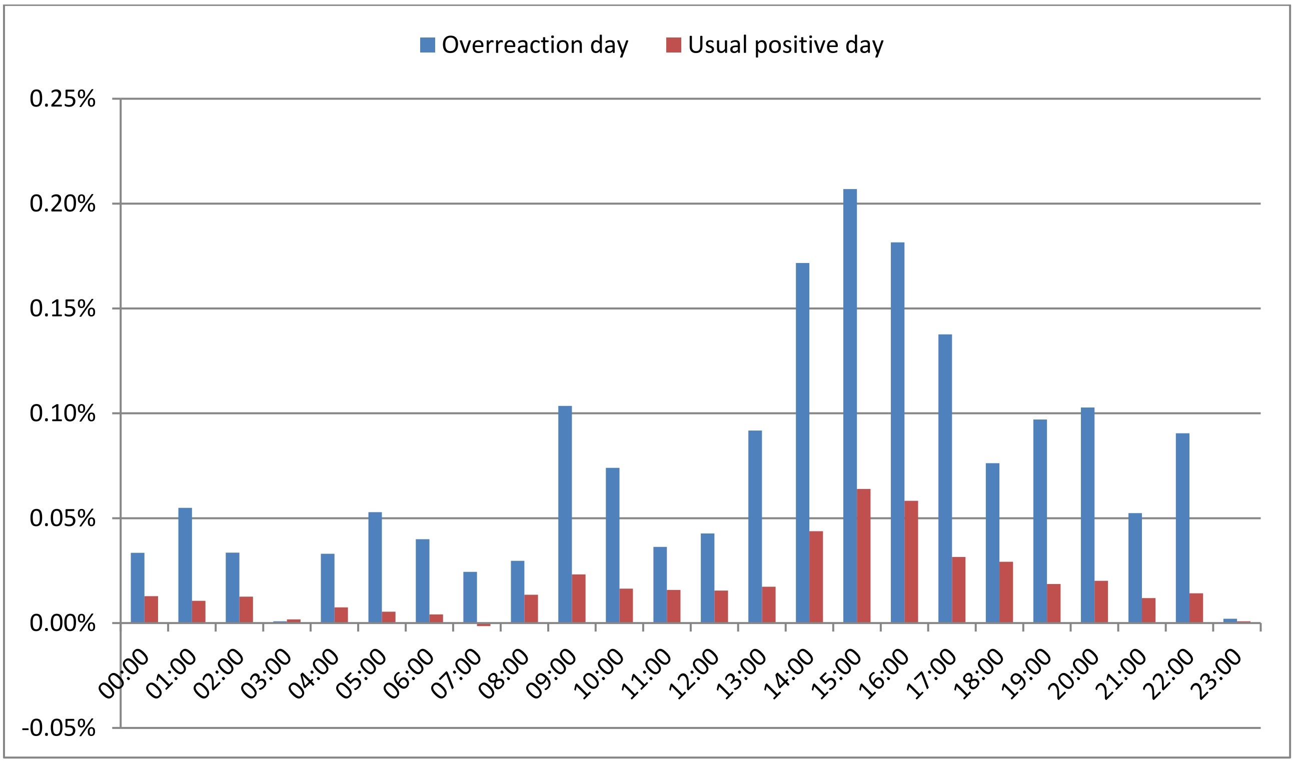


Figure E.2: Average hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, USDCAD

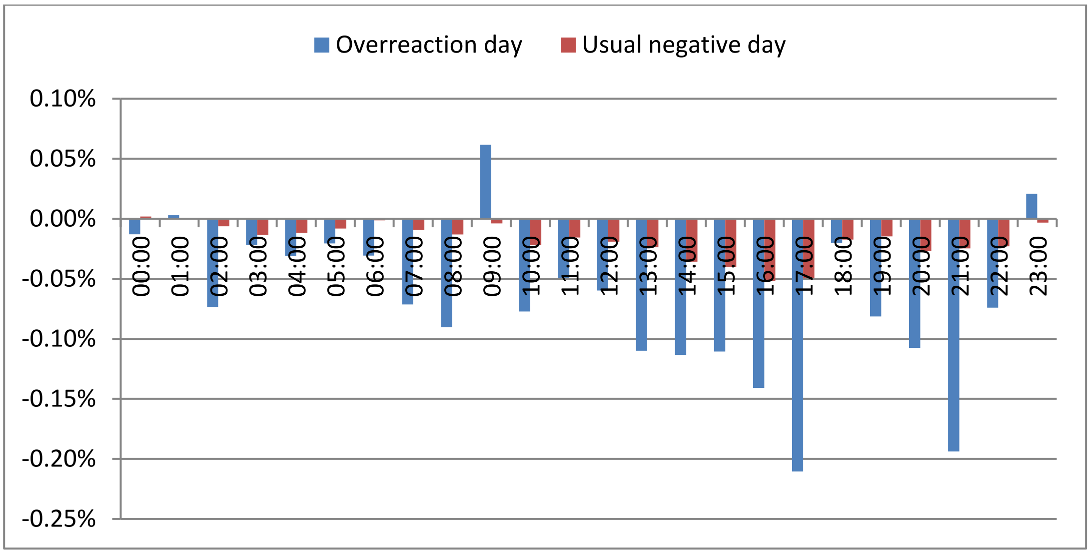


Table E.2: t-test of hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes, USDCAD

Hour	Average return on day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with positive returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	0.0003	0.0010	58	0.0001	0.0007	2700	1.56
1:00	**0.0005**	**0.0014**	**58**	**0.0001**	**0.0009**	**2700**	**2.35**
2:00	0.0003	0.0016	58	0.0001	0.0009	2700	0.98
3:00	0.0000	0.0011	58	0.0000	0.0008	2700	-0.06
4:00	**0.0003**	**0.0010**	**58**	**0.0001**	**0.0008**	**2700**	**1.85**
5:00	**0.0005**	**0.0017**	**58**	**0.0001**	**0.0008**	**2700**	**2.15**
6:00	**0.0004**	**0.0014**	**58**	**0.0000**	**0.0007**	**2700**	**1.93**
7:00	0.0002	0.0013	58	0.0000	0.0007	2700	1.55
8:00	0.0003	0.0021	58	0.0001	0.0012	2700	0.58
9:00	**0.0010**	**0.0021**	**58**	**0.0002**	**0.0013**	**2700**	**2.87**
10:00	**0.0007**	**0.0022**	**58**	**0.0002**	**0.0013**	**2700**	**1.97**
11:00	0.0004	0.0023	58	0.0002	0.0012	2700	0.68
12:00	0.0004	0.0022	58	0.0002	0.0012	2700	0.94
13:00	**0.0009**	**0.0024**	**58**	**0.0002**	**0.0014**	**2700**	**2.33**
14:00	**0.0017**	**0.0029**	**58**	**0.0004**	**0.0018**	**2700**	**3.32**
15:00	**0.0021**	**0.0031**	**58**	**0.0006**	**0.0021**	**2700**	**3.53**
16:00	**0.0018**	**0.0038**	**58**	**0.0006**	**0.0020**	**2700**	**2.48**
17:00	**0.0014**	**0.0042**	**58**	**0.0003**	**0.0020**	**2700**	**1.93**
18:00	0.0008	0.0027	58	0.0003	0.0014	2700	1.33
19:00	**0.0010**	**0.0021**	**58**	**0.0002**	**0.0013**	**2700**	**2.85**
20:00	**0.0010**	**0.0028**	**58**	**0.0002**	**0.0014**	**2700**	**2.26**
21:00	0.0005	0.0033	58	0.0001	0.0014	2700	0.95
22:00	**0.0009**	**0.0020**	**58**	**0.0001**	**0.0011**	**2700**	**2.91**
23:00	0.0000	0.0011	58	0.0000	0.0007	2700	0.08

Table E.3: t-test of hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, USDCAD

Hour	Average return on day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with negative returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	-0.0001	0.0011	60	0.0000	0.0007	2700	-1.04
1:00	0.0000	0.0016	60	0.0000	0.0008	2700	0.12
2:00	**-0.0007**	**0.0019**	**60**	**-0.0001**	**0.0009**	**2700**	**-2.79**
3:00	-0.0002	0.0014	60	-0.0001	0.0008	2700	-0.47
4:00	-0.0003	0.0014	60	-0.0001	0.0008	2700	-1.05
5:00	-0.0002	0.0015	60	-0.0001	0.0007	2700	-0.62
6:00	-0.0003	0.0013	60	0.0000	0.0007	2700	-1.77
7:00	**-0.0007**	**0.0017**	**60**	**-0.0001**	**0.0008**	**2700**	**-2.81**
8:00	**-0.0009**	**0.0018**	**60**	**-0.0001**	**0.0011**	**2700**	**-3.30**
9:00	**0.0006**	**0.0028**	**60**	**0.0000**	**0.0014**	**2700**	**1.79**
10:00	**-0.0008**	**0.0022**	**60**	**-0.0002**	**0.0013**	**2700**	**-1.93**
11:00	-0.0005	0.0023	60	-0.0002	0.0012	2700	-1.14
12:00	-0.0006	0.0019	60	-0.0002	0.0013	2700	-1.64
13:00	**-0.0011**	**0.0026**	**60**	**-0.0002**	**0.0014**	**2700**	**-2.51**
14:00	**-0.0011**	**0.0031**	**60**	**-0.0004**	**0.0019**	**2700**	**-1.91**
15:00	-0.0011	0.0038	60	-0.0004	0.0020	2700	-1.45
16:00	-0.0014	0.0043	60	-0.0005	0.0020	2700	-1.59
17:00	**-0.0021**	**0.0034**	**60**	**-0.0005**	**0.0019**	**2700**	**-3.64**
18:00	-0.0002	0.0029	60	-0.0002	0.0014	2700	-0.07
19:00	-0.0008	0.0035	60	-0.0001	0.0013	2700	-1.48
20:00	**-0.0011**	**0.0033**	**60**	**-0.0003**	**0.0014**	**2700**	**-1.88**
21:00	**-0.0019**	**0.0039**	**60**	**-0.0002**	**0.0014**	**2700**	**-3.36**
22:00	**-0.0007**	**0.0015**	**60**	**-0.0002**	**0.0010**	**2700**	**-2.69**
23:00	**0.0002**	**0.0011**	**60**	**0.0000**	**0.0008**	**2700**	**1.68**

Figure E.3: Dynamics of cumulative abnormal returns, USDCAD

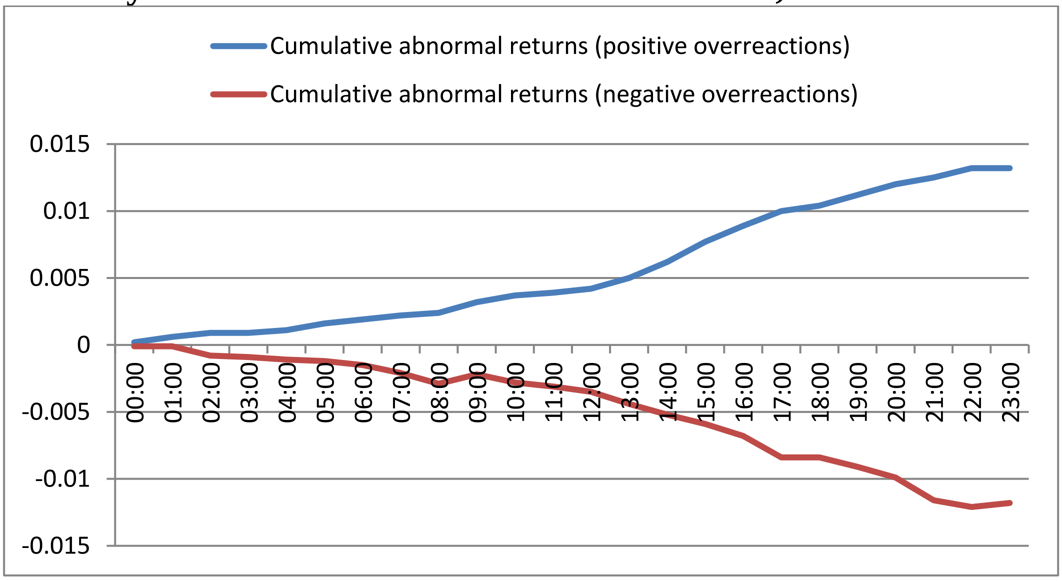


Table E.4: Cumulative abnormal returns: the case of positive and negative abnormal price changes, USDCAD

Hour	Positive abnormal price changes			Negative abnormal price changes		
	Abnormal returns	CAR	Abnormal price change cross	Abnormal returns	CAR	Abnormal price change cross
0:00	0.0002	0.0002	0.0122	-0.0001	-0.0001	-0.0122
1:00	0.0004	0.0006	0.0116	0.0000	-0.0001	-0.0122
2:00	0.0002	0.0009	0.0113	-0.0007	-0.0008	-0.0115
3:00	0.0000	0.0009	0.0113	-0.0001	-0.0009	-0.0112
4:00	0.0003	0.0011	0.0110	-0.0002	-0.0011	-0.0109
5:00	0.0005	0.0016	0.0104	-0.0001	-0.0012	-0.0107
6:00	0.0004	0.0019	0.0100	-0.0003	-0.0015	-0.0104
7:00	0.0003	0.0022	0.0098	-0.0006	-0.0021	-0.0097
8:00	0.0002	0.0024	0.0095	-0.0008	-0.0029	-0.0088
9:00	0.0008	0.0032	0.0085	0.0007	-0.0022	-0.0094
10:00	0.0006	0.0037	0.0077	-0.0006	-0.0028	-0.0087
11:00	0.0002	0.0039	0.0073	-0.0003	-0.0031	-0.0082
12:00	0.0003	0.0042	0.0069	-0.0004	-0.0035	-0.0076
13:00	0.0007	0.0050	0.0060	-0.0009	-0.0044	-0.0065
14:00	0.0013	0.0062	0.0043	-0.0008	-0.0052	-0.0053
15:00	0.0014	0.0077	0.0022	-0.0007	-0.0059	-0.0042
16:00	0.0012	0.0089	**0.0004**	-0.0009	-0.0068	-0.0028
17:00	0.0011	0.0100	**-0.0010**	-0.0016	-0.0084	-0.0007
18:00	0.0005	0.0104	-0.0017	0.0000	-0.0084	**-0.0005**
19:00	0.0008	0.0112	-0.0027	-0.0007	-0.0091	**0.0003**
20:00	0.0008	0.0120	-0.0037	-0.0008	-0.0099	0.0014
21:00	0.0004	0.0125	-0.0043	-0.0017	-0.0116	0.0033
22:00	0.0008	0.0132	-0.0052	-0.0005	-0.0121	0.0041
23:00	0.0000	0.0132	-0.0052	0.0002	-0.0118	0.0038

Appendix F

USDCAD: day after the day with abnormal price changes

Figure F.1: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, USDCAD

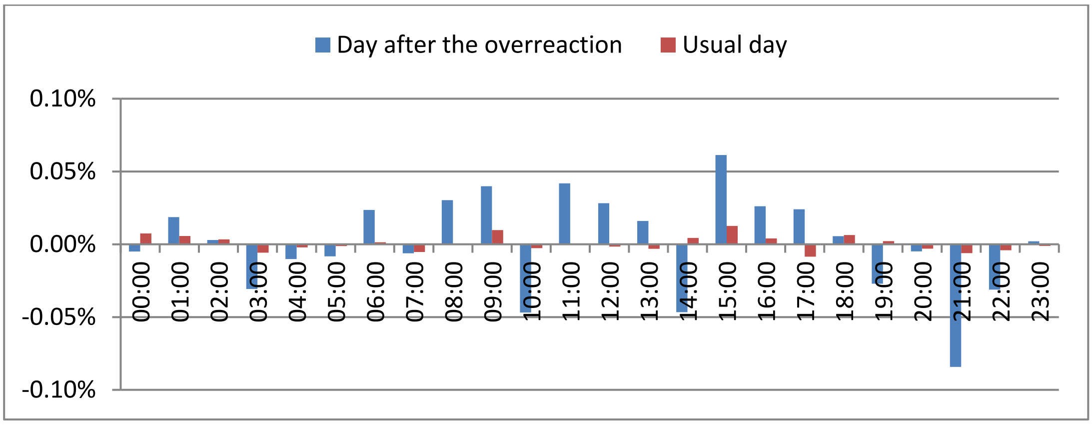


Table F.1: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, USDCAD

Hour	Average return on day after the day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	-0.0001	0.0013	58	0.0001	0.0007	2700	-0.74
1:00	0.0002	0.0013	58	0.0001	0.0008	2700	0.74
2:00	0.0000	0.0016	58	0.0000	0.0009	2700	-0.02
3:00	-0.0003	0.0013	58	-0.0001	0.0008	2700	-1.42
4:00	-0.0001	0.0014	58	0.0000	0.0008	2700	-0.43
5:00	-0.0001	0.0014	58	0.0000	0.0008	2700	-0.39
6:00	0.0002	0.0015	58	0.0000	0.0007	2700	1.14
7:00	-0.0001	0.0014	58	-0.0001	0.0008	2700	-0.05
8:00	0.0003	0.0026	58	0.0000	0.0011	2700	0.87
9:00	0.0004	0.0027	58	0.0001	0.0013	2700	0.86
10:00	-0.0005	0.0021	58	0.0000	0.0013	2700	-1.61
11:00	0.0004	0.0022	58	0.0000	0.0012	2700	1.46
12:00	0.0003	0.0029	58	0.0000	0.0013	2700	0.77
13:00	0.0002	0.0026	58	0.0000	0.0014	2700	0.55
14:00	-0.0005	0.0032	58	0.0000	0.0019	2700	-1.20
15:00	0.0006	0.0033	58	0.0001	0.0021	2700	1.11
16:00	0.0003	0.0038	58	0.0000	0.0021	2700	0.45
17:00	0.0002	0.0039	58	-0.0001	0.0020	2700	0.64
18:00	0.0001	0.0027	58	0.0001	0.0014	2700	-0.02
19:00	-0.0003	0.0024	58	0.0000	0.0013	2700	-0.93
20:00	0.0000	0.0028	58	0.0000	0.0014	2700	-0.05
21:00	-0.0008	0.0036	58	-0.0001	0.0015	2700	-1.66
22:00	-0.0003	0.0022	58	0.0000	0.0010	2700	-0.92
23:00	0.0000	0.0010	58	0.0000	0.0008	2700	0.23

Figure F.2: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, USDCAD

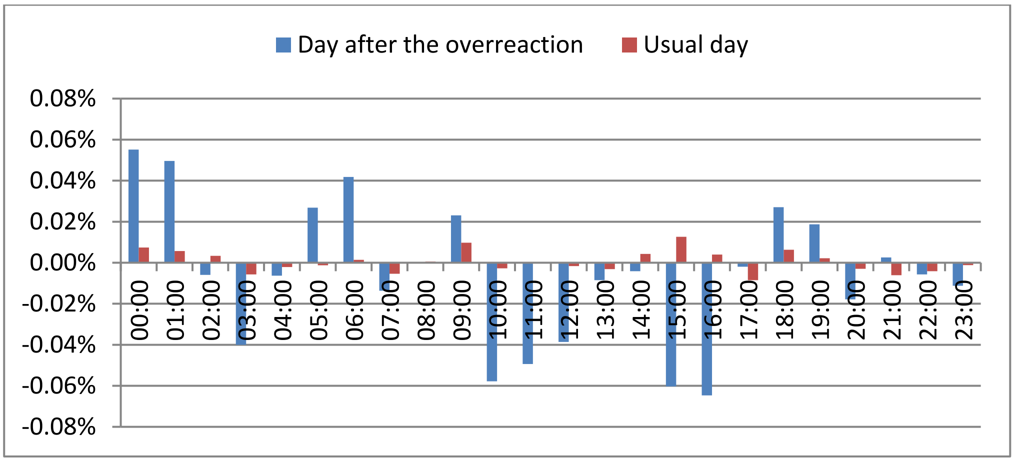


Table F.2: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, USDCAD

Hour	Average return on day after the day with negative abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	**0.0006**	**0.0013**	**58**	**0.0001**	**0.0007**	**2700**	**2.76**
1:00	0.0005	0.0022	58	0.0001	0.0008	2700	1.49
2:00	-0.0001	0.0015	58	0.0000	0.0009	2700	-0.47
3:00	**-0.0004**	**0.0013**	**58**	**-0.0001**	**0.0008**	**2700**	**-2.02**
4:00	-0.0001	0.0015	58	0.0000	0.0008	2700	-0.21
5:00	0.0003	0.0017	58	0.0000	0.0008	2700	1.28
6:00	**0.0004**	**0.0012**	**58**	**0.0000**	**0.0007**	**2700**	**2.50**
7:00	-0.0001	0.0016	58	-0.0001	0.0008	2700	-0.40
8:00	0.0000	0.0022	58	0.0000	0.0011	2700	-0.02
9:00	0.0002	0.0028	58	0.0001	0.0013	2700	0.36
10:00	-0.0006	0.0027	58	0.0000	0.0013	2700	-1.57
11:00	-0.0005	0.0022	58	0.0000	0.0012	2700	-1.70
12:00	-0.0004	0.0024	58	0.0000	0.0013	2700	-1.17
13:00	-0.0001	0.0022	58	0.0000	0.0014	2700	-0.19
14:00	0.0000	0.0038	58	0.0000	0.0019	2700	-0.17
15:00	**-0.0006**	**0.0029**	**58**	**0.0001**	**0.0021**	**2700**	**-1.88**
16:00	-0.0006	0.0039	58	0.0000	0.0021	2700	-1.32
17:00	0.0000	0.0032	58	-0.0001	0.0020	2700	0.15
18:00	0.0003	0.0026	58	0.0001	0.0014	2700	0.60
19:00	0.0002	0.0018	58	0.0000	0.0013	2700	0.69
20:00	-0.0002	0.0025	58	0.0000	0.0014	2700	-0.45
21:00	0.0000	0.0030	58	-0.0001	0.0015	2700	0.21
22:00	-0.0001	0.0018	58	0.0000	0.0010	2700	-0.06
23:00	-0.0001	0.0012	58	0.0000	0.0008	2700	-0.63

Figure F.3: Dynamics of cumulative abnormal returns, USDCAD

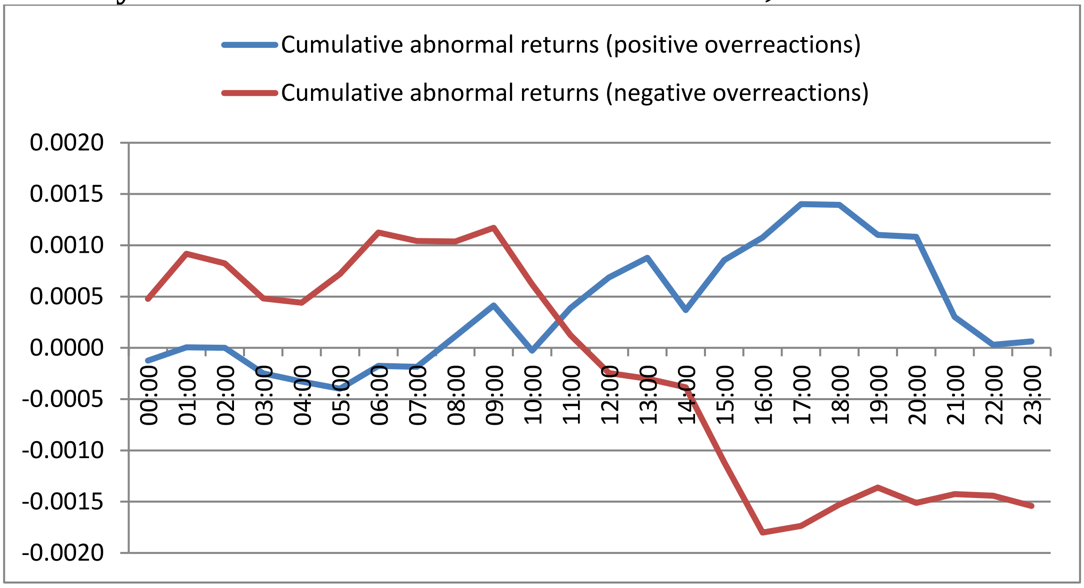


Table F.3: Cumulative abnormal returns: the case of positive and negative abnormal price changes, USDCAD

Hour	Positive abnormal price changes		Negative abnormal price changes	
	Abnormal returns	Cumulative abnormal returns	Abnormal returns	Cumulative abnormal returns
0:00	-0.0001	-0.0001	0.0005	0.0005
1:00	0.0001	0.0000	0.0004	0.0009
2:00	0.0000	0.0000	-0.0001	0.0008
3:00	-0.0002	-0.0002	-0.0003	0.0005
4:00	-0.0001	-0.0003	0.0000	0.0004
5:00	-0.0001	-0.0004	0.0003	0.0007
6:00	0.0002	-0.0002	0.0004	0.0011
7:00	0.0000	-0.0002	-0.0001	0.0010
8:00	0.0003	0.0001	0.0000	0.0010
9:00	0.0003	0.0004	0.0001	**0.0012**
10:00	-0.0004	0.0000	-0.0006	0.0006
11:00	0.0004	0.0004	-0.0005	0.0001
12:00	0.0003	0.0007	-0.0004	-0.0002
13:00	0.0002	0.0009	-0.0001	-0.0003
14:00	-0.0005	0.0004	-0.0001	-0.0004
15:00	0.0005	0.0009	-0.0007	-0.0011
16:00	0.0002	0.0011	-0.0007	-0.0018
17:00	0.0003	**0.0014**	0.0001	-0.0017
18:00	0.0000	**0.0014**	0.0002	-0.0015
19:00	-0.0003	0.0011	0.0002	-0.0014
20:00	0.0000	0.0011	-0.0001	-0.0015
21:00	-0.0008	0.0003	0.0001	-0.0014
22:00	-0.0003	0.0000	0.0000	-0.0014
23:00	0.0000	0.0001	-0.0001	-0.0015

Appendix G

AUDUSD: day of abnormal price changes

Table G.1: Descriptive statistics for AUDUSD data: daily, hourly, days with positive and negative returns

Parameter	**Daily data**	**Positive days**	**Negative days**	**Hourly data**	**Positive days (hourly data)**	**Negative days (hourly data)**
Mean	0.0000	0.0057	-0.0063	0.0000	0.0002	-0.0003
Standard error	0.0002	0.0002	0.0002	0.0000	0.0000	0.0000
Median	0.0002	0.0042	-0.0044	0.0000	0.0001	-0.0001
Mode	0.0079	0.0079	0.0000	0.0000	0.0000	0.0000
Std. Dev.	0.0089	0.0061	0.0069	0.0018	0.0017	0.0018
Variance	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Kurtosis	13.7517	35.9662	30.0117	23.8962	18.8843	28.3470
Skewness	-0.3583	4.2355	-4.0556	-0.3232	1.1639	-1.6546
Minimum	-0.0823	0.0000	-0.0823	-0.0371	-0.0213	-0.0371
Maximum	0.0840	0.0840	0.0000	0.0284	0.0284	0.0258
Sum	-0.1063	8.3510	-8.4573	-0.1590	7.8791	-8.0374
Observations	2805	1461	1346	65000	33691	31356

Figure G.1: Average hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes, AUDUSD

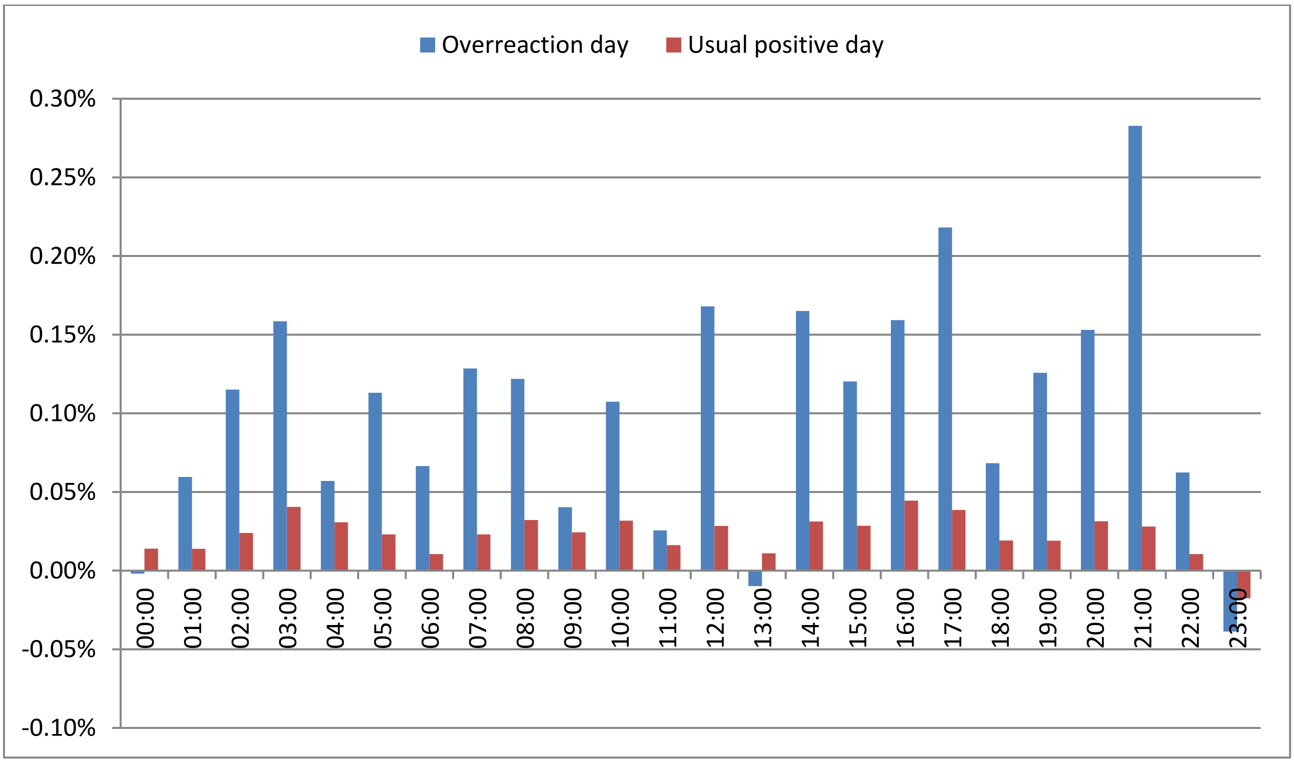


Figure G.2: Average hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, AUDUSD

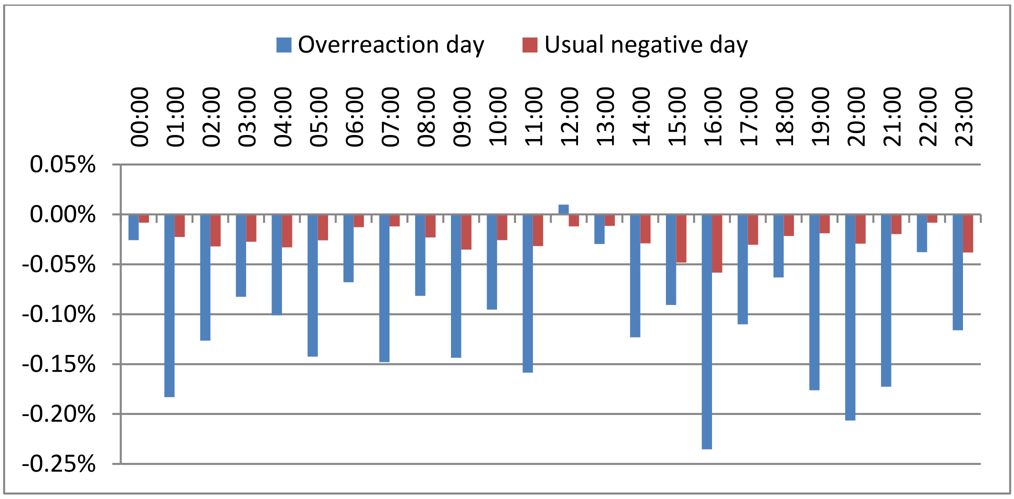


Table G.2: t-test of hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes, AUDUSD

Hour	Average return on day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with positive returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	0.0000	0.0023	58	0.0001	0.0013	1300	-0.53
1:00	0.0006	0.0035	58	0.0001	0.0016	1300	1.00
2:00	**0.0012**	**0.0036**	**58**	**0.0002**	**0.0018**	**1300**	**1.91**
3:00	**0.0016**	**0.0047**	**58**	**0.0004**	**0.0018**	**1300**	**1.91**
4:00	0.0006	0.0033	58	0.0003	0.0017	1300	0.60
5:00	**0.0011**	**0.0030**	**58**	**0.0002**	**0.0014**	**1300**	**2.28**
6:00	0.0007	0.0030	58	0.0001	0.0013	1300	1.44
7:00	**0.0013**	**0.0030**	**58**	**0.0002**	**0.0014**	**1300**	**2.67**
8:00	**0.0012**	**0.0037**	**58**	**0.0003**	**0.0017**	**1300**	**1.86**
9:00	0.0004	0.0040	58	0.0002	0.0018	1300	0.30
10:00	**0.0011**	**0.0025**	**58**	**0.0003**	**0.0017**	**1300**	**2.24**
11:00	0.0003	0.0033	58	0.0002	0.0016	1300	0.21
12:00	**0.0017**	**0.0034**	**58**	**0.0003**	**0.0016**	**1300**	**3.11**
13:00	-0.0001	0.0033	58	0.0001	0.0015	1300	-0.47
14:00	**0.0017**	**0.0049**	**58**	**0.0003**	**0.0020**	**1300**	**2.05**
15:00	0.0012	0.0046	58	0.0003	0.0022	1300	1.52
16:00	0.0016	0.0055	58	0.0004	0.0023	1300	1.59
17:00	**0.0022**	**0.0031**	**58**	**0.0004**	**0.0019**	**1300**	**4.43**
18:00	0.0007	0.0033	58	0.0002	0.0016	1300	1.13
19:00	0.0013	0.0057	58	0.0002	0.0018	1300	1.43
20:00	**0.0015**	**0.0051**	**58**	**0.0003**	**0.0019**	**1300**	**1.82**
21:00	**0.0028**	**0.0076**	**58**	**0.0003**	**0.0022**	**1300**	**2.56**
22:00	0.0006	0.0030	58	0.0001	0.0012	1300	1.33
23:00	-0.0004	0.0018	58	-0.0002	0.0010	1300	-0.87

Table G.3: t-test of hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, AUDUSD

Hour	Average return on day with negative abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with negative returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	-0.0003	0.0023	58	-0.0001	0.0013	1300	-0.58
1:00	**-0.0018**	**0.0034**	**58**	**-0.0002**	**0.0016**	**1300**	**-3.62**
2:00	**-0.0013**	**0.0031**	**58**	**-0.0003**	**0.0018**	**1300**	**-2.30**
3:00	**-0.0008**	**0.0024**	**58**	**-0.0003**	**0.0018**	**1300**	**-1.74**
4:00	**-0.0010**	**0.0029**	**58**	**-0.0003**	**0.0017**	**1300**	**-1.77**
5:00	**-0.0014**	**0.0040**	**58**	**-0.0003**	**0.0017**	**1300**	**-2.23**
6:00	-0.0007	0.0032	58	-0.0001	0.0014	1300	-1.32
7:00	**-0.0015**	**0.0057**	**58**	**-0.0001**	**0.0018**	**1300**	**-1.82**
8:00	-0.0008	0.0033	58	-0.0002	0.0017	1300	-1.32
9:00	**-0.0014**	**0.0035**	**58**	**-0.0004**	**0.0019**	**1300**	**-2.35**
10:00	-0.0010	0.0049	58	-0.0003	0.0020	1300	-1.09
11:00	-0.0016	0.0057	58	-0.0003	0.0020	1300	-1.69
12:00	0.0001	0.0038	58	-0.0001	0.0016	1300	0.43
13:00	-0.0003	0.0039	58	-0.0001	0.0016	1300	-0.36
14:00	-0.0012	0.0048	58	-0.0003	0.0021	1300	-1.48
15:00	-0.0009	0.0048	58	-0.0005	0.0022	1300	-0.67
16:00	**-0.0024**	**0.0064**	**58**	**-0.0006**	**0.0024**	**1300**	**-2.08**
17:00	-0.0011	0.0044	58	-0.0003	0.0022	1300	-1.38
18:00	-0.0006	0.0033	58	-0.0002	0.0017	1300	-0.94
19:00	**-0.0018**	**0.0053**	**58**	**-0.0002**	**0.0019**	**1300**	**-2.27**
20:00	**-0.0021**	**0.0047**	**58**	**-0.0003**	**0.0019**	**1300**	**-2.88**
21:00	**-0.0017**	**0.0065**	**58**	**-0.0002**	**0.0022**	**1300**	**-1.78**
22:00	-0.0004	0.0033	58	-0.0001	0.0014	1300	-0.69
23:00	-0.0012	0.0041	58	-0.0004	0.0014	1300	-1.46

Figure G.3: Dynamics of cumulative abnormal returns, AUDUSD

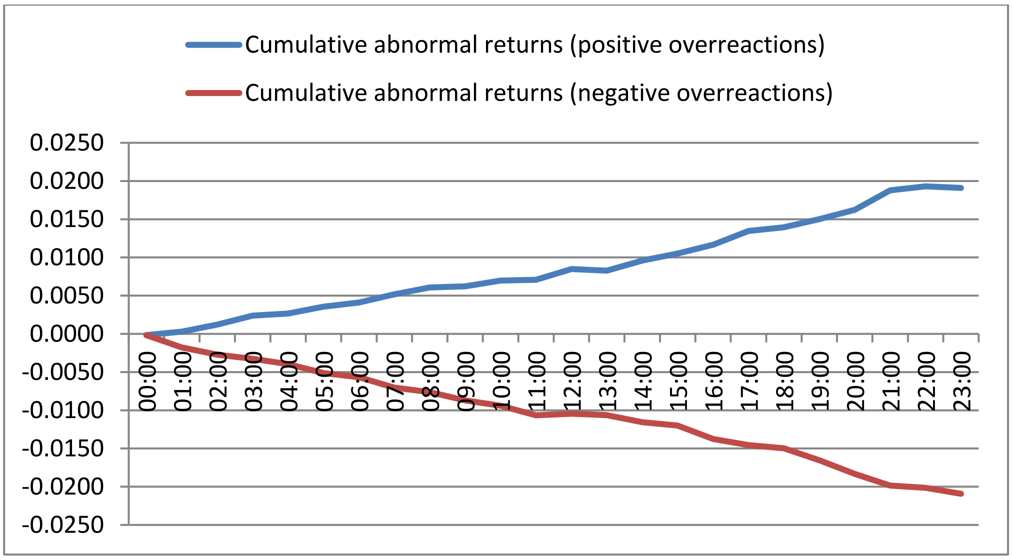


Table G.4: Cumulative abnormal returns: the case of positive and negative abnormal price changes, AUDUSD

Hour	Positive abnormal price changes			Negative abnormal price changes		
	Abnormal returns	CAR	Abnormal price change cross	Abnormal returns	CAR	Abnormal price change cross
0:00	-0.0002	-0.0002	0.0177	-0.0002	-0.0002	-0.0175
1:00	0.0005	0.0003	0.0171	-0.0016	-0.0018	-0.0157
2:00	0.0009	0.0012	0.0160	-0.0009	-0.0027	-0.0144
3:00	0.0012	0.0024	0.0144	-0.0006	-0.0033	-0.0136
4:00	0.0003	0.0027	0.0138	-0.0007	-0.0040	-0.0126
5:00	0.0009	0.0036	0.0127	-0.0012	-0.0051	-0.0111
6:00	0.0006	0.0041	0.0120	-0.0006	-0.0057	-0.0105
7:00	0.0011	0.0052	0.0107	-0.0014	-0.0070	-0.0090
8:00	0.0009	0.0061	0.0095	-0.0006	-0.0076	-0.0082
9:00	0.0002	0.0062	0.0091	-0.0011	-0.0087	-0.0067
10:00	0.0008	0.0070	0.0080	-0.0007	-0.0094	-0.0058
11:00	0.0001	0.0071	0.0078	-0.0013	-0.0107	-0.0042
12:00	0.0014	0.0085	0.0061	0.0002	-0.0104	-0.0043
13:00	-0.0002	0.0083	0.0062	-0.0002	-0.0106	-0.0040
14:00	0.0013	0.0096	0.0046	-0.0009	-0.0116	-0.0028
15:00	0.0009	0.0105	0.0033	-0.0004	-0.0120	<u>**-0.0019**</u>
16:00	0.0011	0.0117	<u>**0.0018**</u>	-0.0018	-0.0138	<u>**0.0005**</u>
17:00	0.0018	0.0135	<u>**-0.0004**</u>	-0.0008	-0.0146	0.0016
18:00	0.0005	0.0140	-0.0011	-0.0004	-0.0150	0.0022
19:00	0.0011	0.0150	-0.0024	-0.0016	-0.0166	0.0040
20:00	0.0012	0.0162	-0.0039	-0.0018	-0.0183	0.0061
21:00	0.0025	0.0188	-0.0067	-0.0015	-0.0199	0.0078
22:00	0.0005	0.0193	-0.0073	-0.0003	-0.0201	0.0082
23:00	-0.0002	0.0191	-0.0070	-0.0008	-0.0209	0.0093

Appendix H

AUDUSD: day after the day with abnormal price changes

Figure H.1: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, AUDUSD

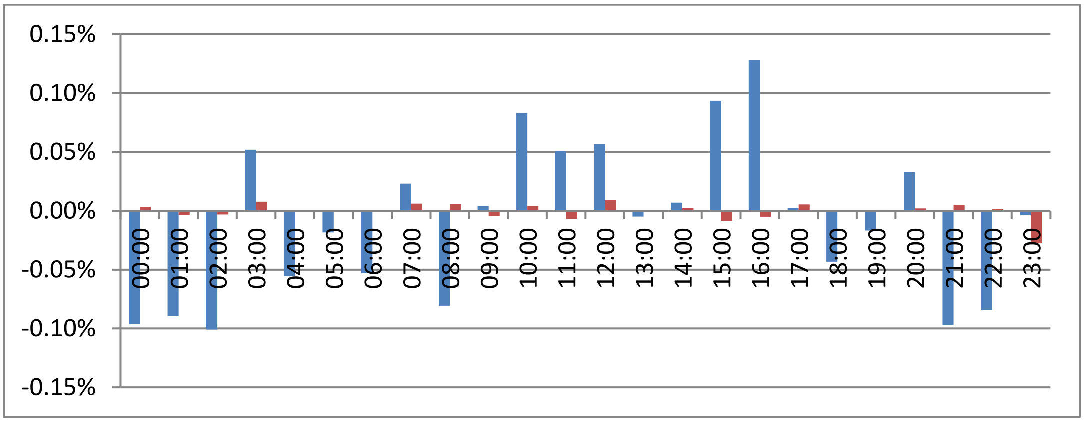


Table H.1: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, AUDUSD

Hour	Average return on day after the day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	**-0.0010**	**0.0030**	**58**	**0.0000**	**0.0013**	**1300**	**-2.49**
1:00	**-0.0009**	**0.0039**	**58**	**0.0000**	**0.0016**	**1300**	**-1.66**
2:00	**-0.0010**	**0.0031**	**58**	**0.0000**	**0.0018**	**1300**	**-2.40**
3:00	0.0005	0.0026	58	0.0001	0.0018	1300	1.30
4:00	-0.0006	0.0032	58	0.0000	0.0017	1300	-1.31
5:00	-0.0002	0.0031	58	0.0000	0.0016	1300	-0.43
6:00	-0.0005	0.0026	58	0.0000	0.0013	1300	-1.51
7:00	0.0002	0.0028	58	0.0001	0.0016	1300	0.46
8:00	-0.0008	0.0042	58	0.0001	0.0017	1300	-1.56
9:00	0.0000	0.0037	58	0.0000	0.0019	1300	0.17
10:00	0.0008	0.0033	58	0.0000	0.0019	1300	1.84
11:00	0.0005	0.0042	58	-0.0001	0.0018	1300	1.03
12:00	0.0006	0.0031	58	0.0001	0.0016	1300	1.17
13:00	0.0000	0.0034	58	0.0000	0.0016	1300	-0.11
14:00	0.0001	0.0045	58	0.0000	0.0021	1300	0.08
15:00	0.0009	0.0044	58	-0.0001	0.0022	1300	1.77
16:00	0.0013	0.0057	58	-0.0001	0.0024	1300	1.78
17:00	0.0000	0.0036	58	0.0001	0.0021	1300	-0.07
18:00	-0.0004	0.0028	58	0.0000	0.0017	1300	-1.16
19:00	-0.0002	0.0045	58	0.0000	0.0019	1300	-0.29
20:00	0.0003	0.0037	58	0.0000	0.0019	1300	0.62
21:00	-0.0010	0.0056	58	0.0000	0.0022	1300	-1.38
22:00	-0.0008	0.0032	58	0.0000	0.0013	1300	-2.06
23:00	0.0000	0.0024	58	-0.0003	0.0012	1300	0.75

Figure H.2: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, AUDUSD

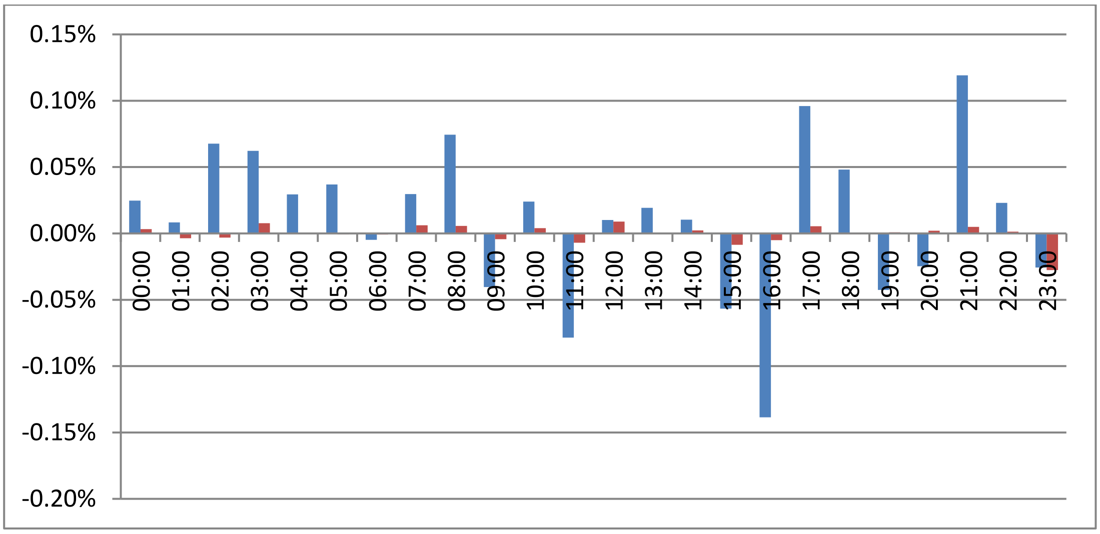


Table H.2: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, AUDUSD

Hour	Average return on day after the day with negative abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	0.0002	0.0038	58	0.0000	0.0013	2700	0.43
1:00	0.0001	0.0025	58	0.0000	0.0016	2700	0.36
2:00	0.0007	0.0040	58	0.0000	0.0018	2700	1.36
3:00	0.0006	0.0045	58	0.0001	0.0018	2700	0.93
4:00	0.0003	0.0030	58	0.0000	0.0017	2700	0.75
5:00	0.0004	0.0030	58	0.0000	0.0016	2700	0.94
6:00	0.0000	0.0035	58	0.0000	0.0013	2700	-0.09
7:00	0.0003	0.0029	58	0.0001	0.0016	2700	0.61
8:00	0.0007	0.0036	58	0.0001	0.0017	2700	1.45
9:00	-0.0004	0.0044	58	0.0000	0.0019	2700	-0.62
10:00	0.0002	0.0034	58	0.0000	0.0019	2700	0.45
11:00	-0.0008	0.0029	58	-0.0001	0.0018	2700	-1.87
12:00	0.0001	0.0037	58	0.0001	0.0016	2700	0.02
13:00	0.0002	0.0038	58	0.0000	0.0016	2700	0.38
14:00	0.0001	0.0041	58	0.0000	0.0021	2700	0.15
15:00	-0.0006	0.0044	58	-0.0001	0.0022	2700	-0.82
16:00	-0.0014	0.0050	58	-0.0001	0.0024	2700	-2.04
17:00	0.0010	0.0043	58	0.0001	0.0021	2700	1.61
18:00	0.0005	0.0038	58	0.0000	0.0017	2700	0.97
19:00	-0.0004	0.0048	58	0.0000	0.0019	2700	-0.69
20:00	-0.0002	0.0042	58	0.0000	0.0019	2700	-0.49
21:00	0.0012	0.0076	58	0.0000	0.0022	2700	1.15
22:00	0.0002	0.0034	58	0.0000	0.0013	2700	0.48
23:00	-0.0003	0.0027	58	-0.0003	0.0012	2700	0.06

Figure H.3: Dynamics of cumulative abnormal returns, AUDUSD

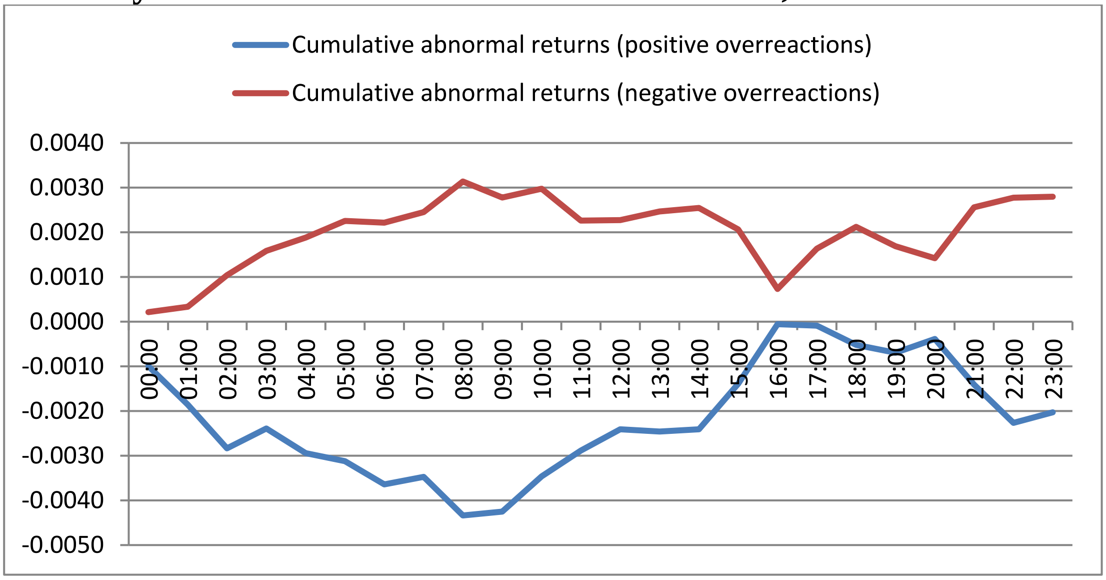


Table H.3: Cumulative abnormal returns: the case of positive and negative abnormal price changes, AUDUSD

Hour	Positive abnormal price changes		Negative abnormal price changes	
	Abnormal returns	Cumulative abnormal returns	Abnormal returns	Cumulative abnormal returns
0:00	-0.0010	-0.0010	0.0002	0.0002
1:00	-0.0009	-0.0019	0.0001	0.0003
2:00	-0.0010	-0.0028	0.0007	0.0010
3:00	0.0004	-0.0024	0.0005	0.0016
4:00	-0.0006	-0.0029	0.0003	0.0019
5:00	-0.0002	-0.0031	0.0004	0.0023
6:00	-0.0005	-0.0036	0.0000	0.0022
7:00	0.0002	-0.0035	0.0002	0.0025
8:00	-0.0009	**-0.0043**	0.0007	**0.0031**
9:00	0.0001	**-0.0043**	-0.0004	0.0028
10:00	0.0008	-0.0035	0.0002	0.0030
11:00	0.0006	-0.0029	-0.0007	0.0023
12:00	0.0005	-0.0024	0.0000	0.0023
13:00	-0.0001	-0.0025	0.0002	0.0025
14:00	0.0000	-0.0024	0.0001	0.0025
15:00	0.0010	-0.0014	-0.0005	0.0021
16:00	0.0013	-0.0001	-0.0013	0.0007
17:00	0.0000	-0.0001	0.0009	0.0016
18:00	-0.0004	-0.0005	0.0005	0.0021
19:00	-0.0002	-0.0007	-0.0004	0.0017
20:00	0.0003	-0.0004	-0.0003	0.0014
21:00	-0.0010	-0.0014	0.0011	0.0026
22:00	-0.0009	-0.0023	0.0002	0.0028
23:00	0.0002	-0.0020	0.0000	0.0028

Appendix I

EURJPY: day of abnormal price changes

Table I.1: Descriptive statistics for EURJPY data: daily, hourly, days with positive and negative returns

Parameter	Daily data	Positive days	Negative days	Hourly data	Positive days (hourly data)	Negative days (hourly data)
Mean	0.0000	0.0055	-0.0059	0.0000	0.0002	-0.0002
Standard error	0.0002	0.0002	0.0002	0.0000	0.0000	0.0000
Median	0.0001	0.0039	-0.0041	0.0000	0.0001	-0.0001
Mode	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Std. Dev.	0.0083	0.0058	0.0062	0.0017	0.0016	0.0017
Variance	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000
Kurtosis	9.2115	31.7532	14.4825	32.8456	23.2972	41.0261
Skewness	-0.0355	3.7926	-2.8803	-0.5922	1.0958	-2.0210
Minimum	-0.0638	0.0000	-0.0638	-0.0496	-0.0318	-0.0496
Maximum	0.0832	0.0832	0.0000	0.0306	0.0306	0.0196
Sum	-0.1191	7.9224	-8.0415	-0.1324	7.6661	-7.7983
Observations	2809	1440	1374	64992	33246	31843

Figure I.1: Average hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes

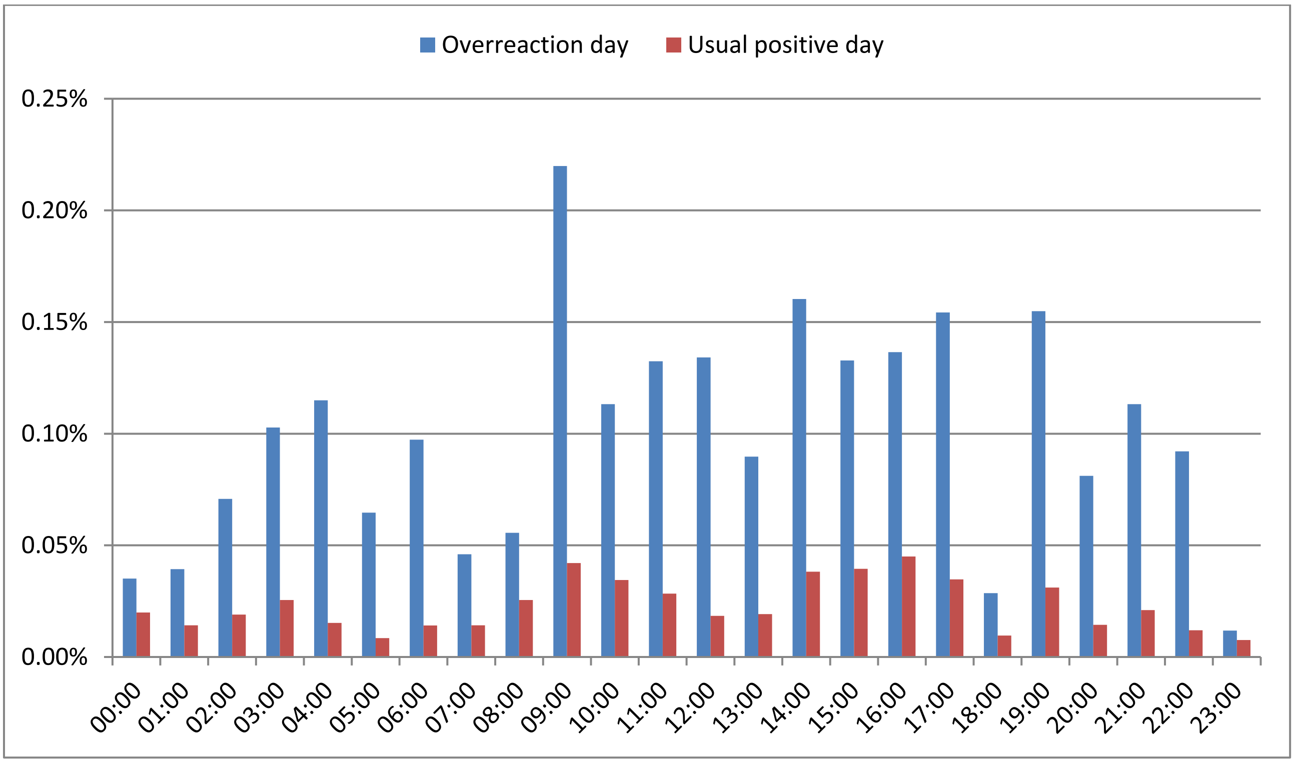


Figure I.2: Average hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, EURJPY

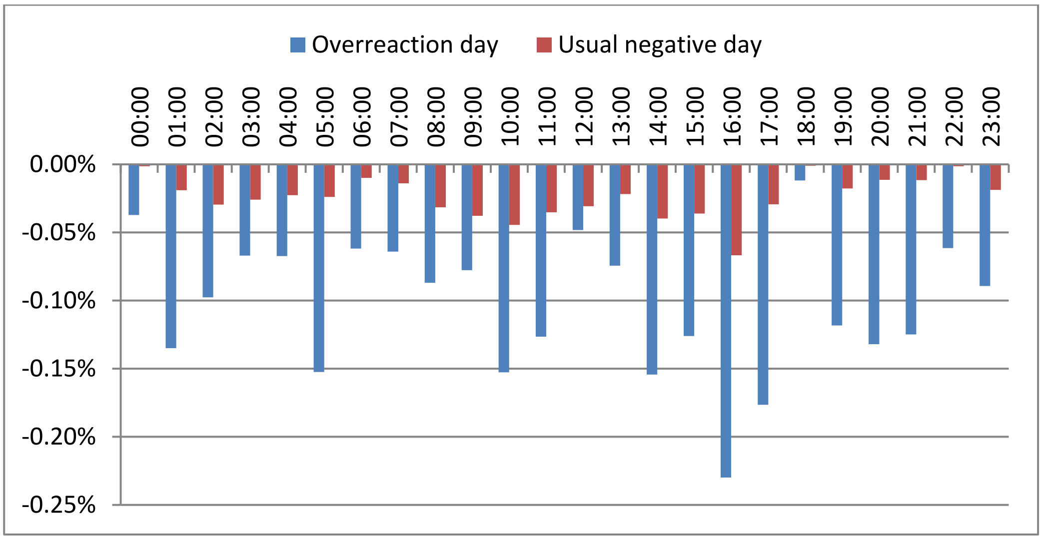


Table I.2: t-test of hourly returns on days with abnormal price changes and normal days: the case of positive abnormal price changes, EURJPY

Hour	Average return on day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with positive returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	0.0004	0.0024	58	0.0002	0.0012	2500	0.49
1:00	0.0004	0.0041	58	0.0001	0.0017	2500	0.47
2:00	0.0007	0.0026	58	0.0002	0.0015	2500	1.50
3:00	**0.0010**	**0.0025**	**58**	**0.0003**	**0.0016**	**2500**	**2.34**
4:00	**0.0011**	**0.0024**	**58**	**0.0002**	**0.0014**	**2500**	**3.19**
5:00	**0.0006**	**0.0021**	**58**	**0.0001**	**0.0013**	**2500**	**2.04**
6:00	0.0010	0.0042	58	0.0001	0.0014	2500	1.50
7:00	0.0005	0.0019	58	0.0001	0.0012	2500	1.25
8:00	0.0006	0.0039	58	0.0003	0.0017	2500	0.58
9:00	**0.0022**	**0.0035**	**58**	**0.0004**	**0.0021**	**2500**	**3.82**
10:00	**0.0011**	**0.0025**	**58**	**0.0003**	**0.0019**	**2500**	**2.38**
11:00	**0.0013**	**0.0029**	**58**	**0.0003**	**0.0016**	**2500**	**2.68**
12:00	**0.0013**	**0.0029**	**58**	**0.0002**	**0.0015**	**2500**	**3.00**
13:00	**0.0009**	**0.0031**	**58**	**0.0002**	**0.0015**	**2500**	**1.71**
14:00	**0.0016**	**0.0042**	**58**	**0.0004**	**0.0021**	**2500**	**2.19**
15:00	**0.0013**	**0.0043**	**58**	**0.0004**	**0.0021**	**2500**	**1.66**
16:00	**0.0014**	**0.0041**	**58**	**0.0005**	**0.0023**	**2500**	**1.70**
17:00	**0.0015**	**0.0035**	**58**	**0.0003**	**0.0018**	**2500**	**2.63**
18:00	0.0003	0.0028	58	0.0001	0.0015	2500	0.51
19:00	**0.0015**	**0.0040**	**58**	**0.0003**	**0.0016**	**2500**	**2.34**
20:00	0.0008	0.0034	58	0.0001	0.0016	2500	1.49
21:00	**0.0011**	**0.0044**	**58**	**0.0002**	**0.0016**	**2500**	**1.60**
22:00	**0.0009**	**0.0036**	**58**	**0.0001**	**0.0012**	**2500**	**1.69**
23:00	0.0001	0.0019	58	0.0001	0.0009	2500	0.17

Table I.3: t-test of hourly returns on days with abnormal price changes and normal days: the case of negative abnormal price changes, EURJPY

Hour	Average return on day with negative abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day with negative returns (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	-0.0004	0.0024	58	0.0000	0.0014	2500	-1.13
1:00	**-0.0013**	**0.0028**	**58**	**-0.0002**	**0.0015**	**2500**	**-3.17**
2:00	**-0.0010**	**0.0028**	**58**	**-0.0003**	**0.0016**	**2500**	**-1.82**
3:00	**-0.0007**	**0.0019**	**58**	**-0.0003**	**0.0014**	**2500**	**-1.61**
4:00	-0.0007	0.0023	58	-0.0002	0.0013	2500	-1.50
5:00	-0.0015	0.0062	58	-0.0002	0.0019	2500	-1.58
6:00	-0.0006	0.0035	58	-0.0001	0.0014	2500	-1.12
7:00	-0.0006	0.0027	58	-0.0001	0.0014	2500	-1.41
8:00	-0.0009	0.0037	58	-0.0003	0.0018	2500	-1.15
9:00	-0.0008	0.0036	58	-0.0004	0.0021	2500	-0.83
10:00	**-0.0015**	**0.0050**	**58**	**-0.0004**	**0.0022**	**2500**	**-1.66**
11:00	**-0.0013**	**0.0035**	**58**	**-0.0004**	**0.0018**	**2500**	**-1.96**
12:00	-0.0005	0.0035	58	-0.0003	0.0016	2500	-0.38
13:00	-0.0007	0.0037	58	-0.0002	0.0017	2500	-1.08
14:00	**-0.0015**	**0.0036**	**58**	**-0.0004**	**0.0021**	**2500**	**-2.40**
15:00	**-0.0013**	**0.0043**	**58**	**-0.0004**	**0.0021**	**2500**	**-1.59**
16:00	**-0.0023**	**0.0046**	**58**	**-0.0007**	**0.0023**	**2500**	**-2.72**
17:00	**-0.0018**	**0.0048**	**58**	**-0.0003**	**0.0021**	**2500**	**-2.34**
18:00	-0.0001	0.0030	58	0.0000	0.0016	2500	-0.28
19:00	**-0.0012**	**0.0045**	**58**	**-0.0002**	**0.0017**	**2500**	**-1.69**
20:00	**-0.0013**	**0.0053**	**58**	**-0.0001**	**0.0018**	**2500**	**-1.73**
21:00	**-0.0012**	**0.0051**	**58**	**-0.0001**	**0.0017**	**2500**	**-1.69**
22:00	-0.0006	0.0038	58	0.0000	0.0013	2500	-1.20
23:00	**-0.0009**	**0.0032**	**58**	**-0.0002**	**0.0012**	**2500**	**-1.67**

Figure I.3: Dynamics of cumulative abnormal returns, EURJPY

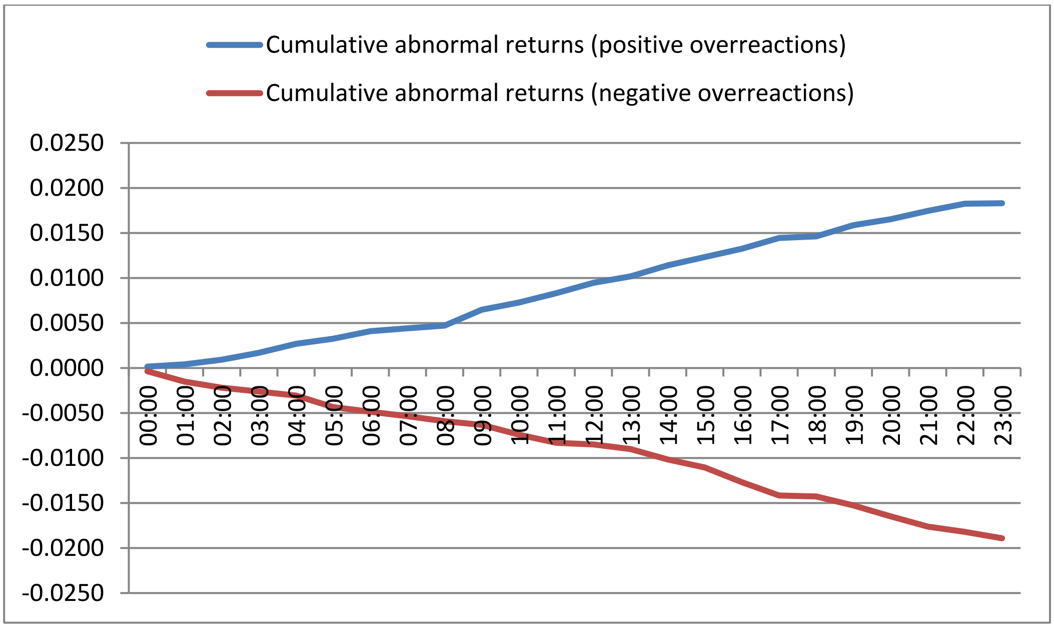


Table I.4: Cumulative abnormal returns: the case of positive and negative abnormal price changes, EURJPY

Hour	Positive abnormal price changes			Negative abnormal price changes		
	Abnormal returns	CAR	Abnormal price change cross	Abnormal returns	CAR	Abnormal price change cross
0:00	0.0002	0.0002	0.0161	-0.0004	-0.0004	-0.0162
1:00	0.0003	0.0004	0.0158	-0.0012	-0.0015	-0.0149
2:00	0.0005	0.0009	0.0150	-0.0007	-0.0022	-0.0139
3:00	0.0008	0.0017	0.0140	-0.0004	-0.0026	-0.0132
4:00	0.0010	0.0027	0.0129	-0.0004	-0.0031	-0.0126
5:00	0.0006	0.0033	0.0122	-0.0013	-0.0043	-0.0110
6:00	0.0008	0.0041	0.0113	-0.0005	-0.0049	-0.0104
7:00	0.0003	0.0044	0.0108	-0.0005	-0.0054	-0.0098
8:00	0.0003	0.0047	0.0102	-0.0006	-0.0059	-0.0089
9:00	0.0018	0.0065	0.0080	-0.0004	-0.0063	-0.0081
10:00	0.0008	0.0073	0.0069	-0.0011	-0.0074	-0.0066
11:00	0.0010	0.0083	0.0056	-0.0009	-0.0083	-0.0053
12:00	0.0012	0.0095	0.0042	-0.0002	-0.0085	-0.0049
13:00	0.0007	0.0102	0.0033	-0.0005	-0.0090	-0.0041
14:00	0.0012	0.0114	0.0017	-0.0011	-0.0102	-0.0026
15:00	0.0009	0.0123	**0.0004**	-0.0009	-0.0111	**-0.0013**
16:00	0.0009	0.0132	**-0.0010**	-0.0016	-0.0127	**0.0010**
17:00	0.0012	0.0144	-0.0025	-0.0015	-0.0142	0.0028
18:00	0.0002	0.0146	-0.0028	-0.0001	-0.0143	0.0029
19:00	0.0012	0.0159	-0.0043	-0.0010	-0.0153	0.0041
20:00	0.0007	0.0165	-0.0051	-0.0012	-0.0165	0.0054
21:00	0.0009	0.0175	-0.0063	-0.0011	-0.0176	0.0066
22:00	0.0008	0.0183	-0.0072	-0.0006	-0.0182	0.0072
23:00	0.0000	0.0183	-0.0073	-0.0007	-0.0189	0.0081

Appendix J
EURJPY: day after the day with abnormal price changes
Figure J.1: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, EURJPY

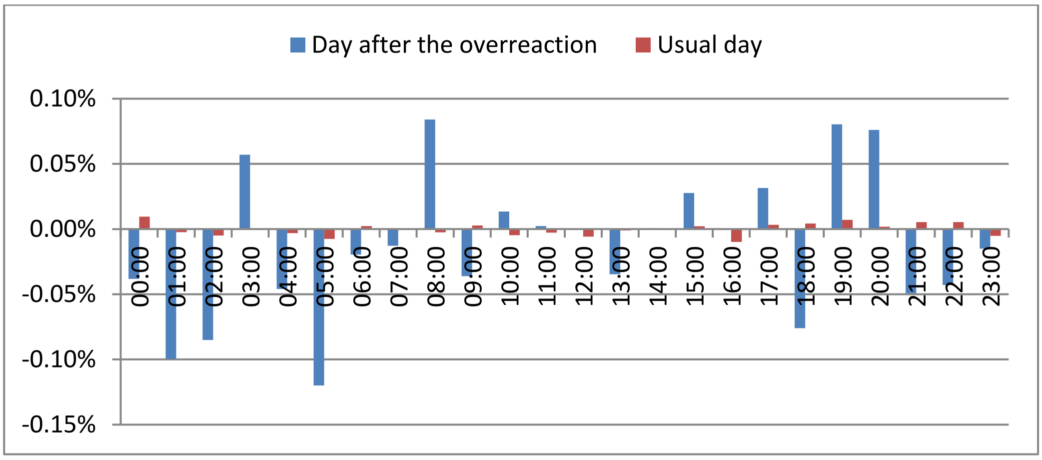


Table J.1: -test of hourly returns on the day after the day with abnormal price changes and normal days: the case of positive abnormal price changes, EURJPY

Hour	Average return on day after the day with positive abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	-0.0004	0.0027	58	0.0001	0.0013	2500	-1.36
1:00	**-0.0010**	**0.0031**	**58**	**0.0000**	**0.0016**	**2500**	**-2.40**
2:00	**-0.0009**	**0.0032**	**58**	**0.0000**	**0.0016**	**2500**	**-1.92**
3:00	0.0006	0.0026	58	0.0000	0.0016	2500	1.64
4:00	-0.0005	0.0021	58	0.0000	0.0014	2500	-1.51
5:00	-0.0012	0.0067	58	-0.0001	0.0016	2500	-1.27
6:00	-0.0002	0.0026	58	0.0000	0.0014	2500	-0.65
7:00	-0.0001	0.0018	58	0.0000	0.0013	2500	-0.57
8:00	0.0008	0.0039	58	0.0000	0.0017	2500	1.70
9:00	-0.0004	0.0034	58	0.0000	0.0021	2500	-0.88
10:00	0.0001	0.0042	58	0.0000	0.0021	2500	0.33
11:00	0.0000	0.0028	58	0.0000	0.0018	2500	0.13
12:00	0.0000	0.0031	58	-0.0001	0.0016	2500	0.15
13:00	-0.0003	0.0033	58	0.0000	0.0016	2500	-0.77
14:00	0.0000	0.0036	58	0.0000	0.0021	2500	0.01
15:00	0.0003	0.0035	58	0.0000	0.0022	2500	0.55
16:00	0.0000	0.0042	58	-0.0001	0.0024	2500	0.18
17:00	0.0003	0.0029	58	0.0000	0.0020	2500	0.72
18:00	-0.0008	0.0025	58	0.0000	0.0015	2500	-2.46
19:00	0.0008	0.0031	58	0.0001	0.0017	2500	1.78
20:00	0.0008	0.0028	58	0.0000	0.0017	2500	1.99
21:00	-0.0005	0.0032	58	0.0001	0.0016	2500	-1.31
22:00	-0.0004	0.0022	58	0.0001	0.0013	2500	-1.68
23:00	-0.0001	0.0015	58	-0.0001	0.0011	2500	-0.49

Figure J.2: Average hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, EURJPY

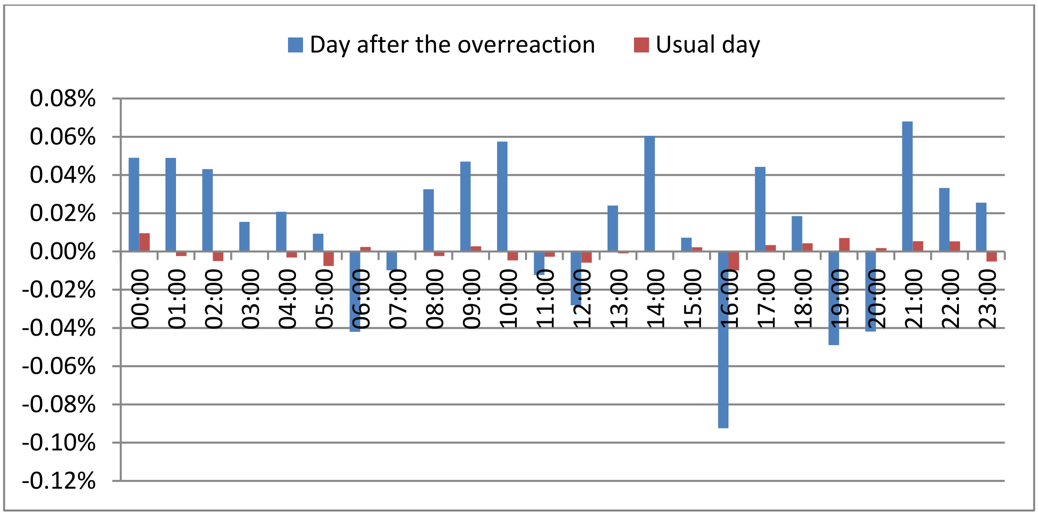


Table J.2: t-test of hourly returns on the day after the day with abnormal price changes and normal days: the case of negative abnormal price changes, EURJPY

Hour	Average return on day after the day with negative abnormal price changes	Standard deviation (OD)	Number of observations (OD)	Average return on usual day (UD)	Standard deviation (UD)	Number of observation (UD)	t criterion
0:00	0.0005	0.0032	58	0.0001	0.0013	2500	0.95
1:00	0.0005	0.0037	58	0.0000	0.0016	2500	1.06
2:00	0.0004	0.0032	58	0.0000	0.0016	2500	1.14
3:00	0.0002	0.0025	58	0.0000	0.0016	2500	0.47
4:00	0.0002	0.0028	58	0.0000	0.0014	2500	0.65
5:00	0.0001	0.0028	58	-0.0001	0.0016	2500	0.45
6:00	-0.0004	0.0034	58	0.0000	0.0014	2500	-0.98
7:00	-0.0001	0.0028	58	0.0000	0.0013	2500	-0.29
8:00	0.0003	0.0033	58	0.0000	0.0017	2500	0.80
9:00	0.0005	0.0042	58	0.0000	0.0021	2500	0.80
10:00	0.0006	0.0033	58	0.0000	0.0021	2500	1.42
11:00	-0.0001	0.0027	58	0.0000	0.0018	2500	-0.26
12:00	-0.0003	0.0027	58	-0.0001	0.0016	2500	-0.62
13:00	0.0002	0.0032	58	0.0000	0.0016	2500	0.59
14:00	0.0006	0.0037	58	0.0000	0.0021	2500	1.23
15:00	0.0001	0.0036	58	0.0000	0.0022	2500	0.11
16:00	-0.0009	0.0054	58	-0.0001	0.0024	2500	-1.16
17:00	0.0004	0.0041	58	0.0000	0.0020	2500	0.75
18:00	0.0002	0.0038	58	0.0000	0.0015	2500	0.29
19:00	-0.0005	0.0033	58	0.0001	0.0017	2500	-1.27
20:00	-0.0004	0.0056	58	0.0000	0.0017	2500	-0.59
21:00	0.0007	0.0055	58	0.0001	0.0016	2500	0.86
22:00	0.0003	0.0021	58	0.0001	0.0013	2500	0.99
23:00	0.0003	0.0024	58	-0.0001	0.0011	2500	0.97

Figure J.3: Dynamics of cumulative abnormal returns, EURJPY

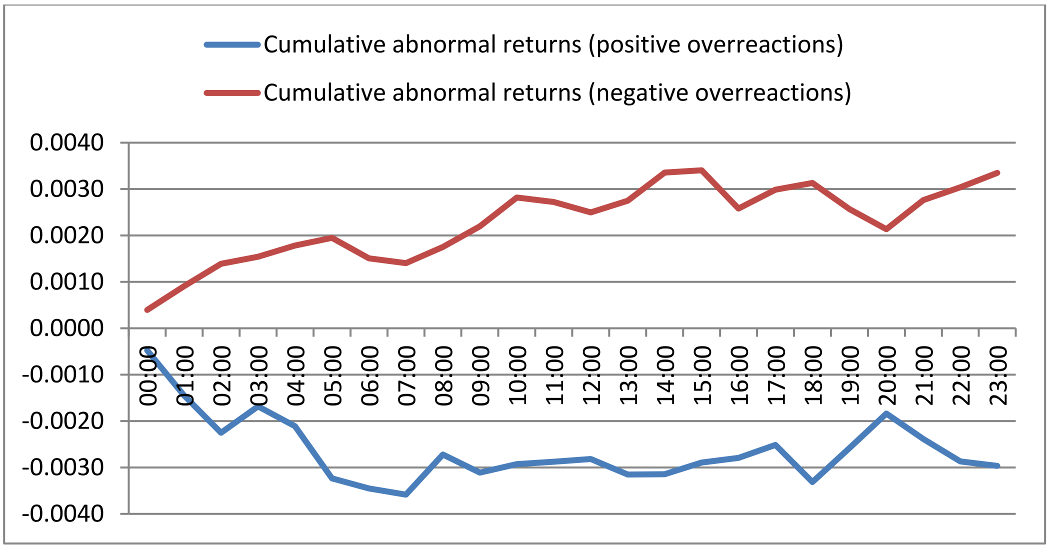


Table J.3: Cumulative abnormal returns: the case of positive and negative abnormal price changes, EURJPY

Hour	Positive abnormal price changes		Negative abnormal price changes	
	Abnormal returns	Cumulative abnormal returns	Abnormal returns	Cumulative abnormal returns
0:00	-0.0005	-0.0005	0.0004	0.0004
1:00	-0.0010	-0.0014	0.0005	0.0009
2:00	-0.0008	-0.0023	0.0005	0.0014
3:00	0.0006	-0.0017	0.0002	0.0015
4:00	-0.0004	-0.0021	0.0002	0.0018
5:00	-0.0011	-0.0032	0.0002	0.0020
6:00	-0.0002	-0.0035	-0.0004	0.0015
7:00	-0.0001	**-0.0036**	-0.0001	0.0014
8:00	0.0009	-0.0027	0.0004	0.0018
9:00	-0.0004	-0.0031	0.0004	0.0022
10:00	0.0002	-0.0029	0.0006	0.0028
11:00	0.0001	-0.0029	-0.0001	0.0027
12:00	0.0001	-0.0028	-0.0002	0.0025
13:00	-0.0003	-0.0032	0.0003	0.0027
14:00	0.0000	-0.0031	0.0006	0.0034
15:00	0.0003	-0.0029	0.0001	**0.0034**
16:00	0.0001	-0.0028	-0.0008	0.0026
17:00	0.0003	-0.0025	0.0004	0.0030
18:00	-0.0008	-0.0033	0.0001	0.0031
19:00	0.0007	-0.0026	-0.0006	0.0026
20:00	0.0007	-0.0018	-0.0004	0.0021
21:00	-0.0005	-0.0024	0.0006	0.0028
22:00	-0.0005	-0.0029	0.0003	0.0030
23:00	-0.0001	-0.0030	0.0003	0.0033