

Investor Behavior and the Disposition Effect in Multi-Day Futures Trading

Andrzej Wodecki¹

Abstract

Research on investor decision-making under conditions of risk and uncertainty has long remained a core concern within behavioral economics. Moving beyond the assumption of full rationality has deepened our understanding of financial behavior by emphasizing the role of cognitive and behavioral factors. This study examines investor responses to daily settlements associated with holding index futures overnight and, using more than 120,000 multi-day transactions from the Warsaw Stock Exchange (WIG20 futures, 2011–2024), investigates how profit realization and loss avoidance patterns vary across different reference points, profit-loss ranges, and holding periods. The results indicate that investors are similarly reluctant to realize shrinking profits and shrinking losses, revealing a systematic pattern in their closing behavior. These findings contribute to a deeper understanding of behavioral regularities in multi-day futures trading.

Keywords: disposition effect, reference point, investor behavior, futures trading, financial economics.

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Introduction

The paradigm of classical economics, which assumes the rational decision-maker, has been challenged by descriptive approaches documenting systematic deviations from full rationality.

Although behavioral biases have been widely documented, existing studies devote relatively little attention to how the disposition effect changes over the duration of an investment transaction.

The disposition effect is widespread in market practice, where decision-makers frequently neglect rational considerations in their choices. The divergence between empirically observed behavior and the predictions of normative economic theory provides the primary motivation for this study.

The aim of this article is to examine the disposition effect in investors' trading decisions and its **implications** for trade exit behavior. Understanding the consequences of cognitive and motivational biases in decision-making is essential for evaluating investment performance.

The study is structured into three parts. The first part describes the disposition effect and reviews its main explanations discussed in the literature. The second part introduces the **reference point underlying the disposition effect** and reviews existing research as a foundation for the empirical analysis. The third part presents the research methodology, together with a detailed description of the study, its results, and conclusions.

1. Disposition Effect: Behavioral Mechanisms and Contemporary Interpretations

The disposition effect, first documented by Shefrin and Statman (1985), refers to investors' tendency to sell assets that have appreciated in value while continuing to hold positions that are trading below their reference price. This behavioral regularity constitutes a systematic deviation from fully rational trading behavior and has been robustly documented in transaction-level data.

Early explanations of the disposition effect emphasized cognitive framing and self-regulatory processes in individual decision-making (Thaler & Shefrin, 1981). From a mental accounting perspective, investors are assumed to evaluate investment outcomes within separate cognitive accounts, which makes them particularly reluctant to close positions associated with losses (Shefrin & Statman, 1985). This tendency is reinforced by self-control mechanisms, whereby the realization of gains provides immediate psychological rewards, while realizing losses imposes immediate psychological costs that dominate longer-term considerations.

Preference-based explanations rooted in prospect theory further complement this view by highlighting the asymmetric evaluation of gains and losses around a reference point (Kahneman & Tversky, 1979). Due to loss aversion and the shape of the value function—concave for gains and convex for losses—investors derive less utility from realizing gains than disutility from realizing losses of comparable magnitude. As a result, losses are perceived as more salient, and investors require substantially stronger signals to realize losing positions than to realize profitable ones, contributing to the persistence of the disposition effect (Zielonka, 2005).

More recent work has moved beyond isolated cognitive biases toward preference-based models that place the act of realization at the center of investor decision-making. Barberis and Xiong (2012) propose a model of realization utility, in which investors derive direct utility from realizing gains and losses at the moment of sale, over and above the utility associated with changes in overall wealth. In this framework, selling at a gain generates immediate positive utility, while selling at a loss produces immediate disutility, offering a coherent explanation for why investors prefer to realize gains rather than losses. Importantly, the model highlights that selling decisions are driven by realization events themselves, rather than by unrealized paper gains and losses.

2. Reference point

A reference point is a benchmark relative to which gains and losses are defined and evaluated in investment decisions. In empirical studies, it is typically operationalized as the purchase price or another economically meaningful anchor. While this benchmark often coincides with the initial transaction price, it may adjust over time as investors update their perceptions of outcomes.

2.1. Disposition Effect Across Markets

Early empirical evidence on the disposition effect was provided by Odean (1998), who used transaction-level data from individual brokerage accounts to show that investors are more likely to realize gains than losses, as reflected in a higher proportion of gains realized (PGR) relative to the proportion of losses realized (PLR). This framework has since become the standard empirical approach to measuring the disposition effect in equity markets.

Subsequent research has demonstrated that the disposition effect is not confined to stock trading by individual investors, but extends across different markets, asset classes, and investor types. Barber and Odean (2013) document the persistence of the effect across countries and trading environments, highlighting its robustness as a behavioral regularity. Evidence from derivative markets further confirms its presence beyond spot equities. For example, Choe and Eom (2009) document a pronounced disposition effect in index futures, with systematic differences across investor groups and an asymmetric manifestation between long and short positions. More recent studies show that the strength of the disposition effect varies across asset classes, being weaker in bond markets (Hincapié-Salazar & Agudelo, 2020), yet still observable in more complex instruments such as exchange-traded certificates and equity options (Bergsma *et al.*, 2019; Pereira da Silva & Mendes, 2021).

Importantly, recent work suggests that the disposition effect is neither uniform across market conditions nor stable over time. Bernard *et al.* (2021) show that its magnitude varies systematically across market cycles, intensifying during downturns. Methodological contributions further caution against a mechanical interpretation of standard disposition measures, demonstrating that commonly used indicators such as PGR – PLR may conflate behavioral biases with rational trading responses to market environments (Maier & Fischer, 2021). Together, these findings indicate that the manifestation of the disposition effect depends on

market context, investor composition, and institutional features, underscoring the importance of examining its dynamics in specific trading environments.

2.1.1. Research Gap

While a substantial body of empirical research documents the presence of the disposition effect across markets, asset classes, and investor types, existing studies predominantly analyze realization behavior at a single decision point or within short holding horizons. Much of the literature relies on account-level or stock-level data and focuses on whether gains are realized more frequently than losses, abstracting from the dynamic evolution of positions over multiple trading days.

In particular, relatively little is known about how the disposition effect unfolds in futures markets characterized by daily mark-to-market settlement, where gains and losses are mechanically crystallized over time rather than solely at the moment of position closure. Although prior work confirms the existence of the disposition effect in index futures (e.g., Choe & Eom, 2009), it does not explicitly examine how repeated settlement affects realization behavior across consecutive holding days, nor how the magnitude of gains and losses interacts with multi-day trading decisions.

This study addresses this gap by examining the disposition effect in multi-day futures trading under daily settlement, using transaction-level data from the Polish derivatives market. By focusing on the temporal dimension of holding periods and the cumulative realization of gains and losses, the analysis provides new evidence on how institutional settlement mechanisms shape observed realization behavior in futures markets.

3. Methodology

3.1. Data and Sample

To evaluate how trade exit decisions vary across profit and loss zones, the study analyzes 121,611 transactions executed on the Warsaw Stock Exchange (WSE) between 2011 and 2024. These transactions were made by 697 clients of a Polish brokerage house. The sample is limited to transactions in WIG20 futures contracts executed during the study period. The analysis is conducted at the transaction level and focuses on systematic patterns in trade exit behavior, abstracting from position direction and individual investor heterogeneity.

3.2. Institutional Setting: WIG20 Futures Market

Unlike stocks, futures contracts traded on the Warsaw Stock Exchange are subject to daily settlement, whereby gains and losses are marked to market and credited or debited to the investor's account. If available funds are insufficient to meet margin requirements, investors are required to replenish the margin or the position is closed by the broker.

Previous studies on the Polish derivatives market suggest that trading behavior is influenced by both behavioral factors and institutional mechanisms. Porczenaluk (2010) documents systematic changes in open interest during price declines and increases, consistent with investors' reluctance to close losing positions. In addition, expiration-related mechanisms have

been shown to generate short-term, non-fundamental price distortions during expiration sessions, commonly referred to as “triple witching days” (Suliga, 2017).

The WIG20 futures contract is a standardized derivative instrument with built-in leverage. Its price movements are directly linked to changes in the WIG20 index, which comprises the twenty largest companies listed on the Warsaw Stock Exchange. One quotation point corresponds to a change of PLN 20 in the investor’s account, settled at the end of each trading day. The point value changed during the sample period; however, all analyses are conducted in points, ensuring consistency across contract specifications. Market activity takes place between 8:45 a.m. and 5:05 p.m. on days when the Warsaw Stock Exchange is open.

In this study, a transaction is defined as a complete trading cycle, consisting of the opening and subsequent closing of a position (buy–sell or sell–buy).

3.3. Empirical Procedure

Consistent with the focus on realization behavior across profit and loss zones, the empirical procedure abstracts from position direction and treats gains and losses symmetrically. This study examines whether investors’ trade exit decisions differ under alternative definitions of gains and losses, based on either the contract’s opening price or the previous day’s settlement price. Transactions were categorized by holding period, ranging from 1 to 20 trading days after the contract’s opening date, and classified as profitable or losing. Following the methodology of Odean (1998), the proportions of gains realized (PGR) and losses realized (PLR) were calculated for each holding period as well as for the cumulative holding horizon.

The PGR and PLR indicators were then calculated as follows:

RP – realized profits – number of closed **profitable** transactions (≥ 1 point profit).

PP – potential profits – number of held transactions that could have been closed **profitably** but were not.

RL – realized losses – number of closed transactions with a loss (≤ 0 points).

PL – potential losses – number of held transactions that could have been closed at a **loss** but were not.

$PGR = RP / (RP + PP)$ – Proportion of Gains Realized

$PLR = RL / (RL + PL)$ – Proportion of Losses Realized

The second method evaluates transaction profitability using an alternative gain–loss definition based on the previous day’s settlement price. Under this approach, outcomes are assessed relative to the most recent settlement rather than the opening price, allowing gains and losses to be classified on a day-by-day basis.

To analyze investor behavior across different point ranges reached during a position, all transactions were grouped into intervals based on the gain or loss recorded either at the moment the position was closed or, for still-open positions, at the end of each trading day. For each interval, we calculated the frequency of closing trades over consecutive days, as well as the cumulative PGR and PLR (and their one-day counterparts, PGR 1D and PLR 1D) over a 20-day horizon. This approach tests whether the resulting PGR and PLR measures differ across point ranges, under alternative reference point definitions.

A comparison of two indicators highlights the difference in investors' propensity to close contracts relative to two reference points. The first indicator is based on the contract's opening price, while the second uses the last settlement price.

Methodological assumption: aggregation across investors.

The analysis is conducted at the transaction level and aggregates trading behavior across investors, implicitly treating the observed transactions as representative of average market behavior. This approach abstracts from individual heterogeneity in preferences and experience, focusing instead on systematic patterns in trade exit decisions. While aggregation may introduce bias if heterogeneous behaviors offset each other, the results should be interpreted as describing market-level realization behavior rather than individual decision-making.

TABLE 1. List of profitable and loss-making positions broken down by the number of completed sessions with an open position on a futures contract

Holding period	1	2	3	4	5	6	7	8	9	10	Σ 1-20
Losses	63 465	33 216	22 748	17 399	13 946	11 262	9 431	8 085	6 958	6 056	226 591
Realized losses	28 652	9 469	4 868	3 199	2 353	1 639	1 277	986	777	692	57 015
Potential losses	34 813	23 747	17 880	14 200	11 593	9 623	8 154	7 099	6 181	5 364	169 576
PLR	0,45	0,29	0,21	0,18	0,17	0,15	0,14	0,12	0,11	0,11	0,25
Gains	58 146	24 207	16 001	11 542	8 639	6 922	5 755	4 809	4 130	3 584	164 437
Realized gains	35 536	9 205	4 940	3 157	2 048	1 359	1 015	820	671	530	61 446
Potential gains	22 610	15 002	11 061	8 385	6 591	5 563	4 740	3 989	3 459	3 054	102 991
PGR	0,61	0,38	0,31	0,27	0,24	0,20	0,18	0,17	0,16	0,15	0,37

Source: own work.

Note. For readability, only days 1–10 are reported. Full results for days 1–20 are available in the Appendix.

TABLE 2. List of profitable and loss-making positions based on the last quotation settlement

Holding period	1	2	3	4	5	6	7	8	9	10	Σ 1-20
Losses	59 021	28 754	19 097	14 436	11 452	9 178	7 720	6 540	5 513	4 914	194 318
Realized losses	26 086	7 797	3 911	2 540	1 832	1 210	909	790	569	474	48 411
Potential losses	32 935	20 957	15 186	11 896	9 620	7 968	6 811	5 750	4 944	4 440	145 907
PLR	0,44	0,27	0,20	0,18	0,16	0,13	0,12	0,12	0,10	0,10	0,25
Gains	62 590	28 669	19 652	14 505	11 133	9 006	7 466	6 354	5 575	4 726	196 710
Realized gains	38 102	10 877	5 897	3 816	2 569	1 788	1 383	1 016	879	748	70 050
Potential Gains	24 488	17 792	13 755	10 689	8 564	7 218	6 083	5 338	4 696	3 978	126 660
PGR	0,61	0,38	0,30	0,26	0,23	0,20	0,19	0,16	0,16	0,16	0,36

Source: own work.

Note. For readability, only days 1–10 are reported. Full results for days 1–20 are available in the Appendix.

Building on the benchmark PGR and PLR results reported above, the following analysis applies alternative transaction classifications to assess how the measured realization behavior changes under different scenarios.

Transactions that were profitable relative to the opening price but classified as losses under the settlement-based definition were examined separately. These transactions are referred to as “losing winners,” as they generated a positive cumulative outcome but a negative result at the final settlement. This classification tests whether the resulting PGR and PLR measures differ systematically from the benchmark PGR and PLR values.

TABLE 3. Reversal transactions: losing winners and winning losers

Holding period	1	2	3	4	5	6	7	8	9	10	Σ 1-20
Losing winner	7 542	6 211	4 642	3 712	2 971	2 421	2 052	1 687	1 519	1 404	42 214
Realized gains	3 789	2 087	1 239	886	639	419	266	269	231	173	10 755
Potential gains	3 753	4 124	3 403	2 826	2 332	2 002	1 786	1 418	1 288	1 231	31 459
PGR	0,50	0,34	0,27	0,24	0,22	0,17	0,13	0,16	0,15	0,12	0,25
Winning loser	13 221	10 944	8 475	6 755	5 455	4 577	3 851	3 253	2 992	2 603	76 829
Realized losses	7 015	3 805	2 190	1 499	1 047	795	602	415	403	383	19 666
Potential losses	6 206	7 139	6 285	5 256	4 408	3 782	3 249	2 838	2 589	2 220	57 163
PLR	0,53	0,35	0,26	0,22	0,19	0,17	0,16	0,13	0,13	0,15	0,26

Source: own work.

Note. For readability, only days 1–10 are reported. Full results for days 1–20 are available in the Appendix.

Transactions were additionally classified according to whether positions that were previously in a loss were closed when the contract price crossed the opening price threshold. This classification tests whether the resulting PGR and PLR measures differ from the benchmark PGR and PLR (and their one-day counterparts) when exit decisions occur around the break-even point.

TABLE 4. Break-even transactions: trades gaining at least 1 point from the opening quotation after a previous-day loss

Holding period	1	2	3	4	5	6	7	8	9	10	Σ 1-20
Break-even transactions	25 881	7 099	4 151	2 636	1 664	1 355	1 097	751	641	503	48 124
Closed	16 490	2 855	1 341	778	424	288	235	152	128	83	23 105
Held	9 391	4 244	2 810	1 858	1 240	1 067	862	599	513	420	25 019
PGR	0,64	0,40	0,32	0,30	0,25	0,21	0,21	0,20	0,20	0,17	0,48
Negative Break-even	14 127	5 502	3 152	2 155	1 410	1 024	905	682	500	378	31 831
Closed	5 707	1 464	564	362	210	113	100	82	39	32	8 845
Held	8 420	4 038	2 588	1 793	1 200	911	805	600	461	346	22 986
PLR	0,40	0,27	0,18	0,17	0,15	0,11	0,11	0,12	0,08	0,08	0,28

Source: own work.

Note. For readability, only days 1–10 are reported. Full results for days 1–20 are available in the Appendix.

TABLE 5. Transactions by point range and day (from opening quotation)

	1	2	3	4	5	6	7	8	9	10	Σ 1-20
Losses from 0 to -9	19 464	6 495	3 564	2 438	1 632	1 256	1 003	817	682	509	40 007
Closed	10 812	2 230	871	519	313	195	137	111	82	52	15 556
Held	8 652	4 265	2 693	1 919	1 319	1 061	866	706	600	457	24 451
PLR from 0 to -9	0,56	0,34	0,24	0,21	0,19	0,16	0,14	0,14	0,12	0,10	0,39
Losses from -10 to -19	15 689	6 363	3 506	2 545	1 675	1 289	857	708	578	477	36 103
Closed	7 479	1 945	794	468	253	192	118	79	58	60	11 651
Held	8 210	4 418	2 712	2 077	1 422	1 097	739	629	520	417	24 452
PLR from -10 to -19	0,48	0,31	0,23	0,18	0,15	0,15	0,14	0,11	0,10	0,13	0,32
Losses from -20 to -29	10 610	5 592	3 247	2 199	1 816	1 184	941	765	604	530	30 006
Closed	4 436	1 549	661	382	267	184	112	96	69	65	8 050
Held	6 174	4 043	2 586	1 817	1 549	1 000	829	669	535	465	21 956
PLR from -20 to -29	0,42	0,28	0,20	0,17	0,15	0,16	0,12	0,13	0,11	0,12	0,27
Losses from -30 to -39	6 669	4 213	2 970	2 098	1 637	1 208	970	746	617	498	24 006
Closed	2 516	1 189	606	372	266	179	128	79	70	61	5 663
Held	4 153	3 024	2 364	1 726	1 371	1 029	842	667	547	437	18 343
PLR from -30 to -39	0,38	0,28	0,20	0,18	0,16	0,15	0,13	0,11	0,11	0,12	0,24
Losses from -40 to -49	4 375	3 184	2 548	1 803	1 495	1 192	961	766	575	548	19 918
Closed	1 473	812	507	316	269	156	95	72	70	52	4 039
Held	2 902	2 372	2 041	1 487	1 226	1 036	866	694	505	496	15 879
PLR from -40 to -49	0,34	0,26	0,20	0,18	0,18	0,13	0,10	0,09	0,12	0,09	0,20
Losses from 50-	6 658	7 369	6 913	6 316	5 691	5 133	4 699	4 283	3 902	3 494	76 551
Closed	1 936	1 744	1 429	1 142	985	733	687	549	428	402	12 056
Held	4 722	5 625	5 484	5 174	4 706	4 400	4 012	3 734	3 474	3 092	64 495
PLR from -40 to -49	0,29	0,24	0,21	0,18	0,17	0,14	0,15	0,13	0,11	0,12	0,16
Gains from 1 to 10	22 434	6 609	3 688	2 317	1 576	1 209	960	787	580	524	42 841
Closed	14 924	2 521	1 082	613	368	254	167	154	104	68	20 511
Held	7 510	4 088	2 606	1 704	1 208	955	793	633	476	456	22 330
PGR from 1 to 10	0,67	0,38	0,29	0,26	0,23	0,21	0,17	0,20	0,18	0,13	0,48
Gains from 11 to 20	15 596	5 206	3 216	2 167	1 474	1 110	916	645	542	446	33 527
Closed	9 859	2 123	1 031	589	351	217	176	107	95	74	14 881
Held	5 737	3 083	2 185	1 578	1 123	893	740	538	447	372	18 646
PGR from 11 to 20	0,63	0,41	0,32	0,27	0,24	0,20	0,19	0,17	0,18	0,17	0,44
Gains from 21 to 30	8 974	4 299	2 452	1 777	1 297	1 024	772	594	539	422	24 148
Closed	5 071	1 643	803	506	335	200	151	107	82	67	9 156
Held	3 903	2 656	1 649	1 271	962	824	621	487	457	355	14 992
PGR from 21 to 30	0,57	0,38	0,33	0,28	0,26	0,20	0,20	0,18	0,15	0,16	0,38
Gains from 31 to 40	4 632	2 721	2 022	1 354	1 072	793	625	585	448	363	16 521
Closed	2 488	1 096	652	374	237	145	103	114	88	64	5 556

Held	2 144	1 625	1 370	980	835	648	522	471	360	299	10 965
PGR from 31 to 40	0,54	0,40	0,32	0,28	0,22	0,18	0,16	0,19	0,20	0,18	0,34
Gains from 41 to 50	2 835	1 949	1 494	1 124	844	698	576	443	386	313	12 405
Closed	1 420	692	491	337	189	130	87	79	66	57	3 733
Held	1 415	1 257	1 003	787	655	568	489	364	320	256	8 672
PGR from 41 to 50	0,50	0,36	0,33	0,30	0,22	0,19	0,15	0,18	0,17	0,18	0,30
Gains from 51+	3 675	3 423	3 129	2 803	2 376	2 088	1 906	1 755	1 635	1 516	34 995
Closed	1 774	1 130	881	738	568	413	331	259	236	200	7 609
Held	1 901	2 293	2 248	2 065	1 808	1 675	1 575	1 496	1 399	1 316	27 386
PGR 51+	0,48	0,33	0,28	0,26	0,24	0,20	0,17	0,15	0,14	0,13	0,22

Source: own work.

Note. For readability, only days 1–10 are reported. Full results for days 1–20 are available in the Appendix.

TABLE 6. Transactions by point range and day (from last settlement – 1D)

	1	2	3	4	5	6	7	8	9	10	∑ 1-20
Losses from 0 to -9	22 616	10 097	6 941	4 977	3 959	3 259	2 591	2 273	1 899	1 738	69 860
Closed	12 454	3 197	1 639	979	673	472	329	317	252	172	21 320
Held	10 162	6 900	5 302	3 998	3 286	2 787	2 262	1 956	1 647	1 566	48 540
PLR from 0 to -9	0,55	0,32	0,24	0,20	0,17	0,14	0,13	0,14	0,13	0,10	0,31
Losses from -10 to -19	15 599	7 564	4 554	3 666	2 992	2 224	1 916	1 666	1 451	1 311	50 173
Closed	7 008	2 308	1 009	640	517	305	240	188	136	135	13 001
Held	8 591	5 256	3 545	3 026	2 475	1 919	1 676	1 478	1 315	1 176	37 172
PLR from -10 to -19	0,45	0,31	0,22	0,17	0,17	0,14	0,13	0,11	0,09	0,10	0,26
Losses from -20 to -29	9 075	4 840	3 343	2 490	1 960	1 633	1 321	1 009	958	842	32 081
Closed	3 404	1 166	603	388	251	218	141	111	80	77	6 827
Held	5 671	3 674	2 740	2 102	1 709	1 415	1 180	898	878	765	25 254
PLR from -20 to -29	0,38	0,24	0,18	0,16	0,13	0,13	0,11	0,11	0,08	0,09	0,21
Losses from -30 to -39	5 081	2 617	1 840	1 384	1 018	799	716	620	470	423	17 667
Closed	1 554	495	316	259	172	83	94	58	36	32	3 345
Held	3 527	2 122	1 524	1 125	846	716	622	562	434	391	14 322
PLR from -30 to -39	0,31	0,19	0,17	0,19	0,17	0,10	0,13	0,09	0,08	0,08	0,19
Losses from -40 to -49	2 953	1 639	1 037	784	658	562	525	433	347	257	10 875
Closed	747	300	161	123	82	51	38	56	34	34	1 771
Held	2 206	1 339	876	661	576	511	487	377	313	223	9 104
PLR from -40 to -49	0,25	0,18	0,16	0,16	0,12	0,09	0,07	0,13	0,10	0,13	0,16
Losses 50+	3 697	1 997	1 382	1 135	865	701	651	539	388	343	13 662
Closed	919	331	183	151	137	81	67	60	31	24	2 147
Held	2 778	1 666	1 199	984	728	620	584	479	357	319	11 515
PLR from -40 to -49	0,25	0,17	0,13	0,13	0,16	0,12	0,10	0,11	0,08	0,07	0,16

Gains from 1 to 10	27 435	10 511	7 276	5 099	3 931	3 020	2 710	2 316	1 798	1 676	74 681
Closed	18 242	4 159	2 024	1 316	889	521	430	327	304	246	29 396
Held	9 193	6 352	5 252	3 783	3 042	2 499	2 280	1 989	1 494	1 430	45 285
PGR from 1 to 10	0,66	0,40	0,28	0,26	0,23	0,17	0,16	0,14	0,17	0,15	0,39
Gains from 11 to 20	17 812	8 336	5 565	4 147	3 150	2 557	1 974	1 796	1 659	1 337	55 943
Closed	11 311	3 343	1 825	1 203	781	550	422	306	255	232	21 048
Held	6 501	4 993	3 740	2 944	2 369	2 007	1 552	1 490	1 404	1 105	34 895
PGR from 11 to 20	0,64	0,40	0,33	0,29	0,25	0,22	0,21	0,17	0,15	0,17	0,38
Gains from 21 to 30	8 927	4 760	3 167	2 509	1 905	1 560	1 295	1 052	972	864	31 706
Closed	4 731	1 789	1 006	638	442	358	273	195	166	139	10 216
Held	4 196	2 971	2 161	1 871	1 463	1 202	1 022	857	806	725	21 490
PGR from 21 to 30	0,53	0,38	0,32	0,25	0,23	0,23	0,21	0,19	0,17	0,16	0,32
Gains from 31 to 40	3 981	2 457	1 653	1 233	969	879	647	528	514	398	15 903
Closed	1 967	877	559	333	231	197	133	96	84	72	4 928
Held	2 014	1 580	1 094	900	738	682	514	432	430	326	10 975
PGR from 31 to 40	0,49	0,36	0,34	0,27	0,24	0,22	0,21	0,18	0,16	0,18	0,31
Gains from 41 to 50	2 180	1 338	1 002	742	622	485	439	325	324	206	9 182
Closed	957	381	237	150	130	88	85	58	44	29	2 313
Held	1 223	957	765	592	492	397	354	267	280	177	6 869
PGR from 41 to 50	0,44	0,28	0,24	0,20	0,21	0,18	0,19	0,18	0,14	0,14	0,25
Gains from 51+	2 255	1 267	989	775	556	505	401	337	308	245	9 295
Closed	894	328	246	176	96	74	40	34	26	30	2 149
Held	1 361	939	743	599	460	431	361	303	282	215	7 146
PGR 51+	0,40	0,26	0,25	0,23	0,17	0,15	0,10	0,10	0,08	0,12	0,23

Source: own work.

Note. For readability, only days 1–10 are reported. Full results for days 1–20 are available in the Appendix.

3.4. Key Findings and Implications

According to Figure 1, investors tend to realize small profits (1–10 points) quickly but are unwilling to accept small losses (0–9 points). The curve on the loss side is flatter, suggesting that there are more profit-making transactions in the 1–50 point range, but a higher number of losses beyond 51 points.

The strongest tendency to close profitable transactions was observed in this sample where trades exceeded the break-even point. This suggests that investors are more likely to close positions that have become profitable during the trading day.

The PGR and PLR ratios for both loss-making positions closed during profitable sessions (“winning losers”) and profit-making positions closed during loss-making sessions exhibit similar values. While the daily and overall ratios are largely consistent, the marginally higher PLR ratio indicates that the investors tend to realize declining losses more readily than declining gains.

The highest nominal difference between PGR and PLR is observed in the first few days after the initial opening. The PGR/PLR decreases over time, indicating that the probability of closing profitable transactions and maintaining loss-closing ones is highest within the first

few days after the transaction start date. In the presented sample, more than half of the transactions were closed just one day after the initial opening (64,188 out of 121,611).

When comparing the shapes of the PGR/PGR 1D and PLR/PLR 1D ratios across individual point ranges (Figure 10), it is evident that the curve representing losses remains relatively stable, whereas the curve for gains exhibits a downward trend. This indicates that the higher the profit achieved within a single session, the more likely the investors are to close their positions. The key point range appears to be between 31–40 points, where the decision-makers pay greater attention to their daily profit than in other ranges (with the exception of the 51+ point range).

Across all analyzed point ranges, the PGR 1D / PLR 1D ratio exceeds the PGR/PLR ratio. This may indicate that, for losses, the investors more frequently use the contract opening quotation as a reference point, whereas, for profits, they are more likely to reference the last settlement date (1D).

4. Conclusions

This study examines investors' trade exit decisions in the context of daily-settled futures contracts, focusing on how gains and losses are realized across different holding periods and point ranges. Using transaction-level data from the WIG20 futures market, the analysis documents systematic patterns consistent with the disposition effect and highlights how alternative gain–loss definitions influence observed closing behavior.

4.1. Empirical Conclusions

Analysis of the sample revealed no significant differences between the transaction closing frequency indicators calculated from the contract opening (PGR and PLR) and those derived from the most recent settlement (PGR 1D and PLR 1D).

The figure illustrating the frequency of closing profitable positions (PGR/PGR 1D), segmented by successive point intervals, displays a decreasing pattern: the higher the one-day profit, the greater the likelihood of closing the position.

The analysis shows that transactions which are profitable relative to the opening price but loss-making relative to the most recent settlement exhibit closing frequencies closer to those observed for losses than for gains. This indicates that, in such cases, trade exit decisions are more closely associated with the most recent gain–loss classification than with the cumulative outcome since the position was opened. This pattern points to a potential research avenue examining whether the outcome of a recently closed transaction influences trade exit decisions in subsequent positions. In particular, future studies could investigate whether closing a position at a gain or a loss affects investors' propensity to realize gains or hold losses in their next trades.

4.2. Study Limitation and Further Research

Regarding futures contracts, it is also valuable to examine the loss thresholds at which investors cease taking action and positions are automatically closed by the broker. The research presented in this paper did not consider the impact of Polish tax regulations on investment

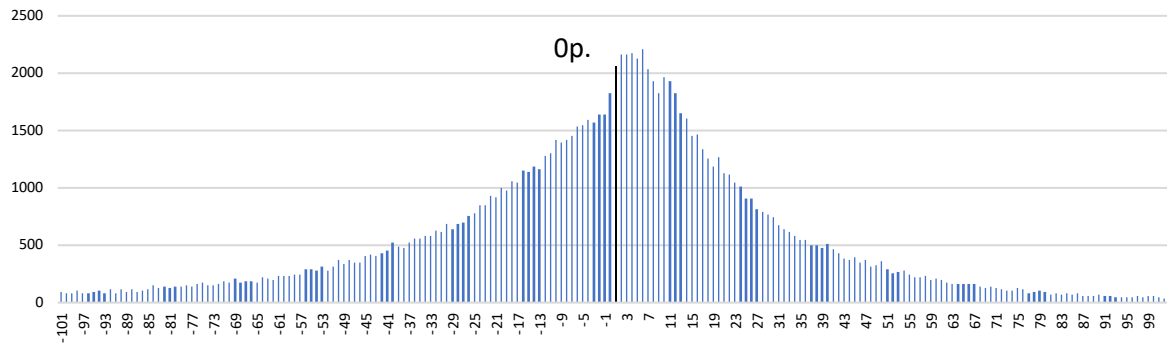
decisions, unlike Odean's study, which found the strongest tendency to sell loss-making shares in December, when investors typically settle their annual accounts by offsetting profits against losses to minimize tax liabilities. Furthermore, the present study did not consider the potential influence of prior transactions on investor decisions, which may play a critical role in establishing individual reference points. The dataset also excluded transactions that were opened and closed within the same trading day. The analysis also did not examine whether investor behavior differs during expiration days, so-called „triple witching” sessions.

Moreover, the study did not differentiate investor behavior based on the type of position (long or short). Although the profit-loss structure of both types of trades is mechanically symmetric, investors may perceive gains and losses with different emotional intensity depending on whether the position reflects an expectation of rising or falling prices. The dataset used in this study shows differences in the average duration and point outcomes of long and short positions; however, these patterns were not examined formally and therefore cannot be incorporated into the study's conclusions. The same limitation applies to potential distinctions between momentum and contrarian trades, which were not separately analyzed.

The analysis did not distinguish any individual client information (age, gender, legal form) from the dataset. Nevertheless, if the sample were disaggregated to the level of individual investors, variations in sensitivity or resistance to the disposition effect might become apparent. Conducting such an experiment could provide significant insights into how this behavioral tendency translates into overall investment performance.

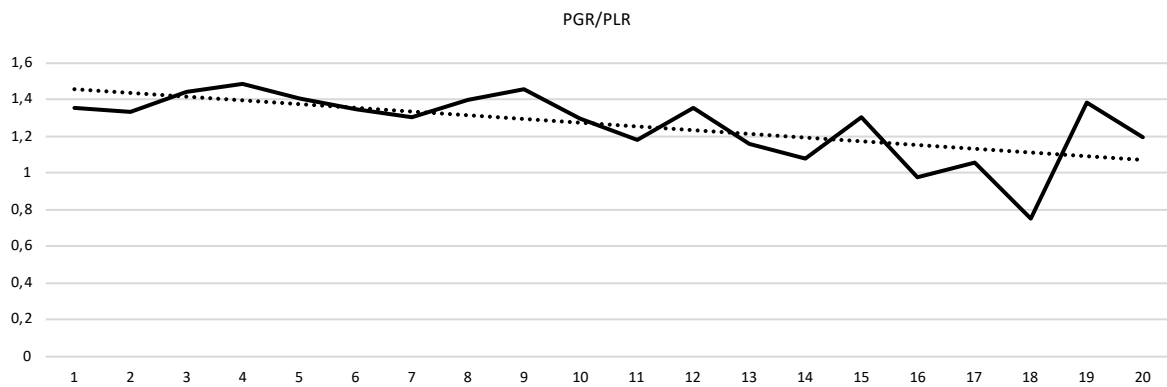
Figures

FIGURE 1. Number of transactions (vertical axis) and point value (horizontal axis) of the transactions examined



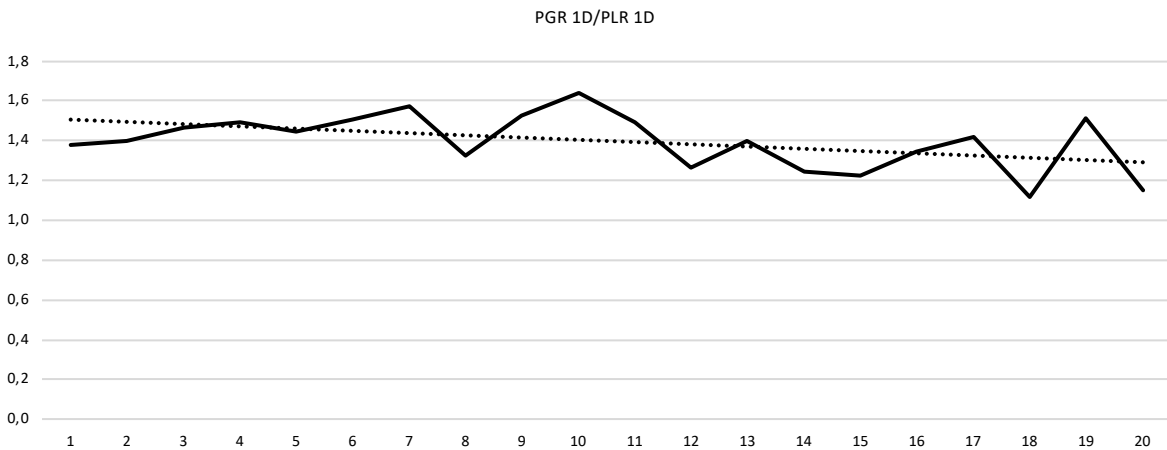
Source: own work.

FIGURE 2. PGR (proportion of gains realized) to PLR (proportion of losses realized) ratio over the course of days



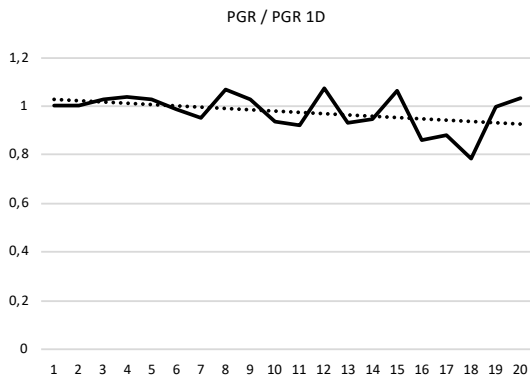
Source: own work.

FIGURE 3. PGR (proportion of gains realized) to PLR (proportion of losses realized) ratio counted from the beginning of the session, over the course of days



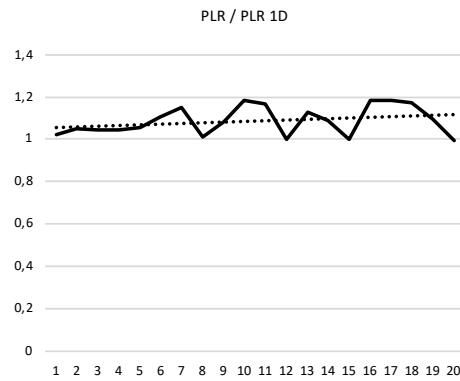
Source: own work.

FIGURE 4. PGR to PGR 1D ratio



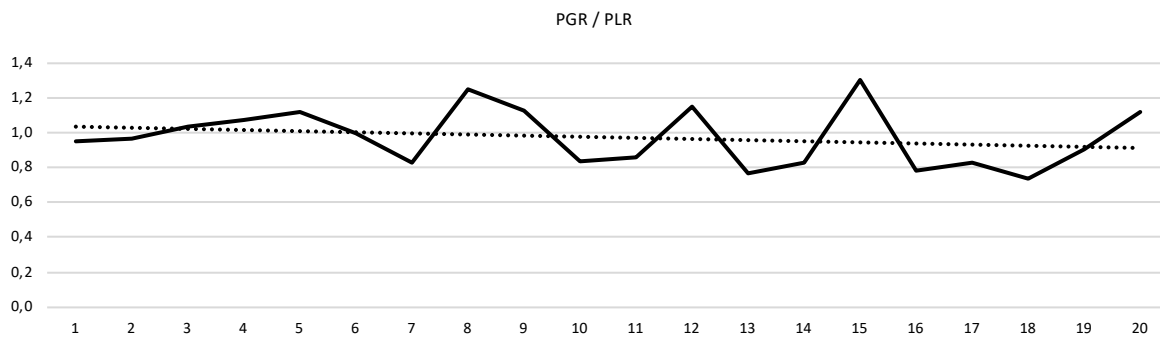
Source: own work.

FIGURE 5. PLR to PLR 1D ratio



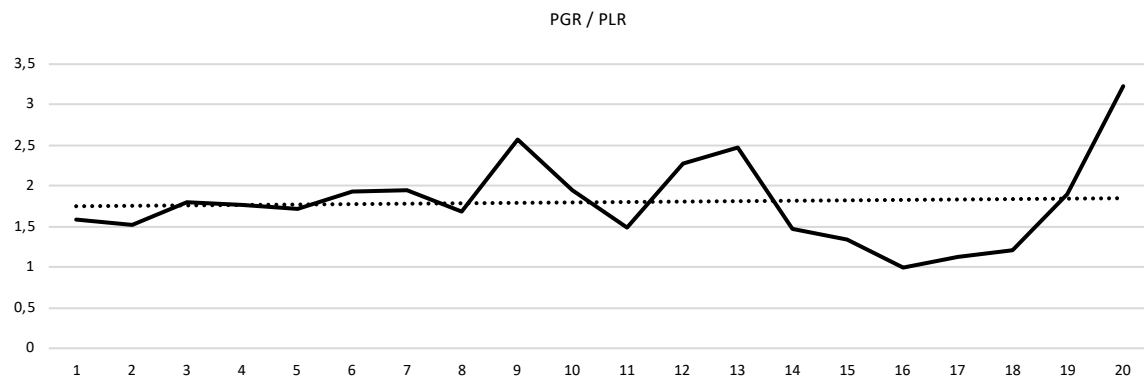
Source: own work.

FIGURE 6. PGR of Losing winner to PLR of Winning loser ratio



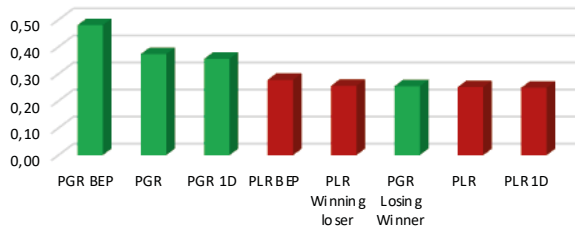
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FIGURE 7. PGR to PLR ratio for break-even transactions



Source: own work.

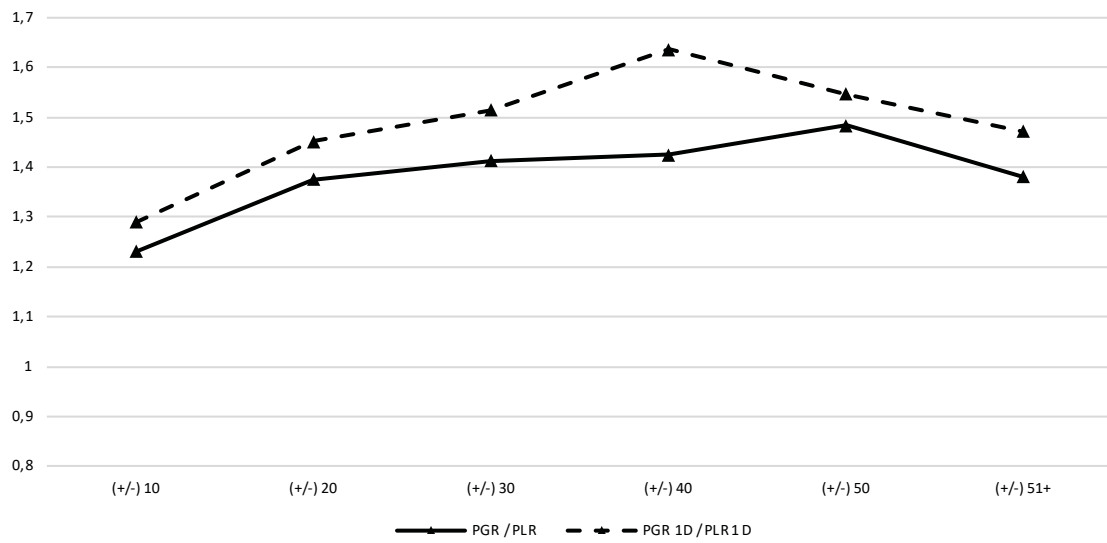
FIGURE 8. PGR and PLR ratios (20-day aggregate values)



PGR BEP (Break-even)	0,48
PGR	0,37
PGR 1D	0,36
PLR BEP	0,28
PLR Winning loser	0,26
PGR Losing Winner	0,25
PLR	0,25
PLR 1D	0,25

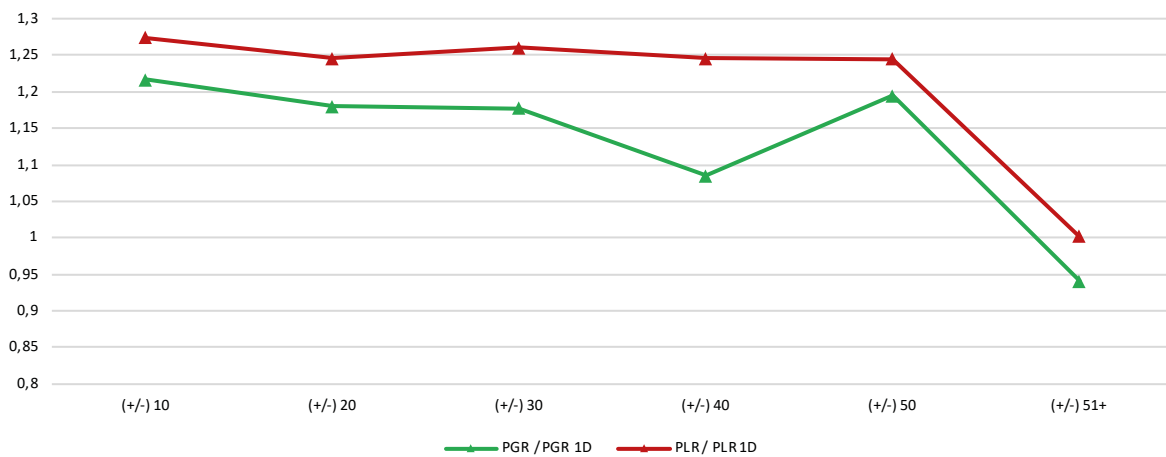
Source: own work.

FIGURE 9. PGR to PLR ratios for both counting methods, broken down into individual point ranges (+/-10 represents +1-10p. for PGR and 0 to -9p. for PLR)



Source: own work.

FIGURE 10. PGR to PGR 1D and PLR to PLR 1D ratios



Source: own work.

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Appendix

TABLE 1. List of profitable and loss-making positions broken down by the number of completed sessions with an open position on a futures contract

Holding period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ 1-20	
Losses	63 465	33 216	22 748	17 399	13 946	11 262	9 431	8 085	6 958	6 056	5 351	4 726	4 170	3 781	3 381	3 002	2 762	2 497	2 281	2 074	2 074	226 591
Realized losses	28 652	9 469	4 868	3 199	2 353	1 639	1 277	986	777	692	601	441	366	357	273	244	261	218	179	163	163	57 015
Potential losses	34 813	23 747	17 880	14 200	11 593	9 623	8 154	7 099	6 181	5 364	4 750	4 285	3 804	3 424	3 108	2 758	2 501	2 279	2 102	1 911	1 911	169 576
PLR	0,45	0,29	0,21	0,18	0,17	0,15	0,14	0,12	0,11	0,11	0,11	0,09	0,09	0,09	0,08	0,08	0,09	0,09	0,08	0,08	0,08	0,25
Average points from realized losses	-19,1	-30,9	-40,2	-46,7	-54,3	-55,0	-64,0	-68,1	-67,9	-72,5	-76,6	-78,5	-81,0	-88,4	-85,4	-87,1	-89,2	-97,4	-102	-102	-113	-113
Avg points from potential losses	-27,2	-35,7	-41,0	-46,0	-49,0	-53,9	-58,2	-62,0	-64,7	-68,5	-70,3	-72,7	-77,6	-78,6	-81,2	-85,5	-87,6	-88	-88	-93	-93	-93
Gains	58 146	24 207	16 001	11 542	8 639	6 922	5 755	4 809	4 130	3 584	3 067	2 686	2 462	2 235	2 050	1 941	1 783	1 609	1 502	1 367	1 367	164 437
Realized gains	35 536	9 205	4 940	3 157	2 048	1 359	1 015	820	671	530	405	339	250	228	215	154	178	105	163	128	128	61 446
Potential gains	22 610	15 002	11 061	8 385	6 591	5 563	4 740	3 989	3 459	3 054	2 662	2 347	2 212	2 007	1 835	1 787	1 605	1 504	1 339	1 239	1 239	102 991
PGR	0,61	0,38	0,31	0,27	0,24	0,20	0,18	0,17	0,16	0,15	0,13	0,13	0,10	0,10	0,10	0,08	0,10	0,07	0,11	0,09	0,09	0,37
Average points from realized gains	17,9	26,0	31,0	35,0	38,7	40,1	42,5	41,7	45,9	51,4	51,5	55,2	56,9	59,5	73,1	72,7	75,0	72,4	72,9	83,1	83,1	83,1
Avg points from potential gains	22,7	29,4	32,3	36,0	38,8	41,3	43,3	47,6	51,0	52,7	56,5	60,1	61,4	63,9	66,1	66,9	68,1	70,9	75,7	77,9	77,9	77,9

Source: own work.

TABLE 2. List of profitable and loss-making positions based on the last quotation settlement

Holding period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ 1-20
Losses	59 021	28 754	19 097	14 436	11 452	9 178	7 720	6 540	5 513	4 914	4 290	3 784	3 448	3 023	2 655	2 451	2 289	2 135	1 868	1 750	194 318
Realized losses	26 086	7 797	3 911	2 540	1 832	1 210	909	790	569	474	413	353	269	262	214	168	183	159	134	138	48 411
Potential losses	32 935	20 957	15 186	11 896	9 620	7 968	6 811	5 750	4 944	4 440	3 877	3 431	3 179	2 761	2 441	2 283	2 106	1 976	1 734	1 612	145 907
PLR	0,44	0,27	0,20	0,18	0,16	0,13	0,12	0,12	0,10	0,10	0,10	0,09	0,08	0,09	0,08	0,07	0,08	0,07	0,07	0,08	0,25
Gains	62 590	28 669	19 652	14 505	11 133	9 006	7 466	6 354	5 575	4 726	4 128	3 628	3 184	2 993	2 776	2 492	2 256	1 971	1 915	1 691	196 710
Realized gains	38 102	10 877	5 897	3 816	2 569	1 788	1 383	1 016	879	748	593	427	347	323	274	230	256	164	208	153	70 050
Potential Gains	24 488	17 792	13 755	10 689	8 564	7 218	6 083	5 338	4 696	3 978	3 535	3 201	2 837	2 670	2 502	2 262	2 000	1 807	1 707	1 538	126 660
PGR	0,61	0,38	0,30	0,26	0,23	0,20	0,19	0,16	0,16	0,16	0,14	0,12	0,11	0,11	0,10	0,09	0,11	0,08	0,11	0,09	0,36

Source: own work.

TABLE 3. Reversal transactions: losing winners and winning losers

Holding period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ1-20
Losing winner	7 542	6 211	4 642	3 712	2 971	2 421	2 052	1 687	1 519	1 404	1 155	1 040	954	896	768	766	715	681	568	510	42 214
Realized gains	3 789	2 087	1 239	886	639	419	266	269	231	173	132	129	71	74	85	52	71	49	44	50	10 755
Average loss during last session	-7.1	-14.2	-26.3	-17.3	-17.4	-16.1	-16.7	-16.8	-19.2	-16.2	-16.7	-20.5	-14.1	-16.9	-18.2	-21.2	-27.4	-22.3	-19.5	-22.1	
Average total gain	11.4	21.0	28.5	33.1	36.0	37.6	39.0	37.0	42.0	51.4	48.2	56.4	56.9	61.1	75.7	77.6	78.4	84.6	75.8	90.0	
Potential gains	3 753	4 124	3 403	2 826	2 332	2 002	1 786	1 418	1 288	1 231	1 023	911	883	822	683	714	644	632	524	460	31 459
Average loss during last session	-8.5	-12.5	-13.6	-14.4	-16.4	-16.5	-17.3	-14.7	-16.2	-14.3	-16.9	-17.4	-16.5	-16.6	-15.7	-14.8	-17.2	-13.9	-15.3	-18.9	
Average potential profit	10.5	19.5	24.6	29.1	32.3	33.6	37.4	42.9	44.4	48.3	51.4	54.2	56.0	61.8	61.5	64.9	59.8	67.3	62.9	73.2	
PGR	0.50	0.34	0.27	0.24	0.22	0.17	0.13	0.16	0.15	0.12	0.11	0.12	0.07	0.08	0.11	0.07	0.10	0.07	0.08	0.10	0.25
Winning loser	13 221	10 944	8 475	6 755	5 455	4 577	3 851	3 253	2 992	2 603	2 245	2 022	1 705	1 687	1 502	1 357	1 225	1 097	1 006	857	76 829
Realized losses	7 015	3 805	2 190	1 499	1 047	795	602	415	403	383	299	218	166	168	128	118	147	107	86	75	19 666
Average gain from last session	8.7	16.2	18.3	20.4	25.4	18.6	18.1	17.9	19.3	16.2	16.8	18.5	17.1	19.2	19.9	22.3	29.8	23.1	27.8	23.4	
Average total loss	-10.6	-24.5	-34.0	-38.6	-44.2	-44.9	-56.2	-58.6	-52.2	-59.0	-62.2	-68.1	-64.2	-74.0	-77.8	-79.4	-73.2	-89.1	-89.3	-93.9	
Potential losses	6 206	7 139	6 285	5 256	4 408	3 782	3 249	2 838	2 589	2 220	1 946	1 804	1 539	1 519	1 374	1 239	1 078	990	920	782	57 163
Average potential gain from last session	9.9	13.5	13.6	15.6	17.0	16.5	16.6	18.4	19.3	17.4	18.4	18.8	18.8	19.9	19.2	18.7	21.3	19.9	21.0	19.2	
Average potential loss	-11.6	-23.9	-30.5	-34.6	-41.0	-43.1	-48.9	-51.2	-57.7	-56.9	-59.3	-61.5	-66.4	-71.0	-70.5	-75.3	-74.6	-81.0	-80.5	-80.0	
PLR	0.53	0.35	0.26	0.22	0.19	0.17	0.16	0.13	0.13	0.15	0.13	0.11	0.10	0.10	0.09	0.09	0.12	0.10	0.09	0.09	0.26

Source: own work.

TABLE 4. Break-even transactions: trades gaining at least 1 point from the opening quotation after a previous-day loss

Holding period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ 1-20	
Break-even transactions	25 881	7 099	4 151	2 636	1 664	1 355	1 097	751	641	503	392	326	363	237	215	231	158	147	133	144	48 124	
Closed	16 490	2 855	1 341	778	424	288	235	152	128	83	57	64	58	36	25	24	21	15	15	15	16	23 105
Held	9 391	4 244	2 810	1 858	1 240	1 067	862	599	513	420	335	262	305	201	190	207	137	132	118	128	128	25 019
PGR	0,64	0,40	0,32	0,30	0,25	0,21	0,21	0,20	0,20	0,17	0,15	0,20	0,16	0,15	0,12	0,10	0,13	0,10	0,11	0,11	0,11	0,48
Negative Break-even	14 127	5 502	3 152	2 155	1 410	1 024	905	682	500	378	379	302	248	214	172	125	162	143	135	116	31 831	
Closed	5 707	1 464	564	362	210	113	100	82	39	32	37	26	16	22	15	13	19	12	8	4	8 845	
Held	8 420	4 038	2 588	1 793	1 200	911	805	600	461	346	342	276	232	192	157	112	143	131	127	112	112	22 986
PLR	0,40	0,27	0,18	0,17	0,15	0,11	0,11	0,12	0,08	0,08	0,10	0,09	0,06	0,10	0,09	0,10	0,12	0,08	0,06	0,03	0,28	

Source: own work.

TABLE 5. Transactions by point range and day (from opening quotation)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ1-20
Losses from 0 to -9	19 464	6 495	3 564	2 438	1 632	1 256	1 003	817	682	509	410	349	271	214	187	149	160	164	129	114	40 007
Closed	10 812	2 230	871	519	313	195	137	111	82	52	48	37	38	24	21	18	18	12	13	5	15 556
Held	8 652	4 265	2 693	1 919	1 319	1 061	866	706	600	457	362	312	233	190	166	131	142	152	116	109	24 451
PLR from 0 to -9	0.56	0.34	0.24	0.21	0.19	0.16	0.14	0.14	0.12	0.10	0.12	0.11	0.14	0.11	0.11	0.12	0.11	0.07	0.10	0.04	0.39
Losses from -10 to -19	15 689	6 363	3 506	2 545	1 675	1 289	857	708	578	477	505	383	268	256	198	179	173	159	173	122	36 103
Closed	7 479	1 945	794	468	253	192	118	79	58	60	43	30	19	25	15	17	25	13	11	7	11 651
Held	8 210	4 418	2 712	2 077	1 422	1 097	739	629	520	417	462	353	249	231	183	162	148	146	162	115	24 452
PLR from -10 to -19	0.48	0.31	0.23	0.18	0.15	0.15	0.14	0.11	0.10	0.13	0.09	0.08	0.07	0.10	0.08	0.09	0.14	0.08	0.06	0.06	0.32
Losses from -20 to -29	10 610	5 592	3 247	2 199	1 816	1 184	941	765	604	530	438	386	327	269	251	214	217	129	136	151	30 006
Closed	4 436	1 549	661	382	267	184	112	96	69	65	47	36	32	21	20	15	23	14	8	13	8 050
Held	6 174	4 043	2 586	1 817	1 549	1 000	829	669	535	465	391	350	295	248	231	199	194	115	128	138	21 956
PLR from -20 to -29	0.42	0.28	0.20	0.17	0.15	0.16	0.12	0.13	0.11	0.12	0.11	0.09	0.10	0.08	0.08	0.07	0.11	0.11	0.06	0.09	0.27
Losses from -30 to -39	6 669	4 213	2 970	2 098	1 637	1 208	970	746	617	498	386	378	308	319	237	179	177	156	130	110	24 006
Closed	2 516	1 189	606	372	266	179	128	79	70	61	41	27	27	26	17	22	14	10	7	6	5 663
Held	4 153	3 024	2 364	1 726	1 371	1 029	842	667	547	437	345	351	281	293	220	157	163	146	123	104	18 343
PLR from -30 to -39	0.38	0.28	0.20	0.18	0.16	0.15	0.13	0.11	0.11	0.12	0.11	0.07	0.09	0.08	0.07	0.12	0.08	0.06	0.05	0.05	0.24
Losses from -40 to -49	4 375	3 184	2 548	1 803	1 495	1 192	961	766	575	548	428	343	366	312	248	216	163	134	125	136	19 918
Closed	1 473	812	507	316	269	156	95	72	70	52	58	33	17	28	22	16	14	13	10	6	4 039
Held	2 902	2 372	2 041	1 487	1 226	1 036	866	694	505	496	370	310	349	284	226	200	149	121	115	130	15 879
PLR from -40 to -49	0.34	0.26	0.20	0.18	0.18	0.13	0.10	0.09	0.12	0.09	0.14	0.10	0.05	0.09	0.09	0.07	0.09	0.10	0.08	0.04	0.20
Losses from 50-	6 658	7 369	6 913	6 316	5 691	5 133	4 699	4 283	3 902	3 494	3 184	2 887	2 630	2 411	2 260	2 065	1 872	1 755	1 588	1 441	76 551
Closed	1 936	1 744	1 429	1 142	985	733	687	549	428	402	364	278	233	233	178	156	167	156	130	126	12 056
Held	4 722	5 625	5 484	5 174	4 706	4 400	4 012	3 734	3 474	3 092	2 820	2 609	2 397	2 178	2 082	1 909	1 705	1 599	1 458	1 315	64 495
PLR from -40 to -49	0.29	0.24	0.21	0.18	0.17	0.14	0.15	0.13	0.11	0.12	0.11	0.10	0.09	0.10	0.08	0.08	0.09	0.09	0.08	0.09	0.16

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ 1-20
Gains from 1 to 10	22 434	6 609	3 688	2 317	1 576	1 209	960	787	580	524	425	292	301	216	180	186	155	154	128	120	42 841
Closed	14 924	2 521	1 082	613	368	254	167	154	104	68	60	48	34	29	26	14	17	11	10	7	20 511
Held	7 510	4 088	2 606	1 704	1 208	955	793	633	476	456	365	244	267	187	154	172	138	143	118	113	22 330
PGR from 1 to 10	0,67	0,38	0,29	0,26	0,23	0,21	0,17	0,20	0,18	0,13	0,14	0,16	0,11	0,13	0,14	0,08	0,11	0,07	0,08	0,06	0,48
Gains from 11 to 20	15 596	5 206	3 216	2 167	1 474	1 110	916	645	542	446	390	297	280	230	193	218	197	147	135	122	33 527
Closed	9 859	2 123	1 031	589	351	217	176	107	95	74	60	44	29	30	18	22	20	12	15	9	14 881
Held	5 737	3 083	2 185	1 578	1 123	893	740	538	447	372	330	253	251	200	175	196	177	135	120	113	18 646
PGR from 11 to 20	0,63	0,41	0,32	0,27	0,24	0,20	0,19	0,17	0,18	0,17	0,15	0,15	0,10	0,13	0,09	0,10	0,10	0,08	0,11	0,07	0,44
Gains from 21 to 30	8 974	4 299	2 452	1 777	1 297	1 024	772	594	539	422	289	272	280	263	209	175	143	135	140	92	24 148
Closed	5 071	1 643	803	506	335	200	151	107	82	67	48	22	28	28	11	7	12	8	18	9	9 156
Held	3 903	2 656	1 649	1 271	962	824	621	487	457	355	241	250	252	235	198	168	131	127	122	83	14 992
PGR from 21 to 30	0,57	0,38	0,33	0,28	0,26	0,20	0,20	0,18	0,15	0,16	0,17	0,08	0,10	0,11	0,05	0,04	0,08	0,06	0,13	0,10	0,38
Gains from 31 to 40	4 632	2 721	2 022	1 354	1 072	793	625	585	448	363	287	288	226	210	206	183	171	137	113	85	16 521
Closed	2 488	1 096	652	374	237	145	103	114	88	64	37	42	27	16	19	11	12	8	13	10	5 556
Held	2 144	1 625	1 370	980	835	648	522	471	360	299	250	246	199	194	187	172	159	129	100	75	10 965
PGR from 31 to 40	0,54	0,40	0,32	0,28	0,22	0,18	0,16	0,19	0,20	0,18	0,13	0,15	0,12	0,08	0,09	0,06	0,07	0,06	0,12	0,12	0,34
Gains from 41 to 50	2 835	1 949	1 494	1 124	844	698	576	443	386	313	279	257	221	195	184	159	136	129	98	85	12 405
Closed	1 420	692	491	337	189	130	87	79	66	57	28	36	25	19	22	11	11	4	21	8	3 733
Held	1 415	1 257	1 003	787	655	568	489	364	320	256	251	221	196	176	162	148	125	125	77	77	8 672
PGR from 41 to 50	0,50	0,36	0,33	0,30	0,22	0,19	0,15	0,18	0,17	0,18	0,10	0,14	0,11	0,10	0,12	0,07	0,08	0,03	0,21	0,09	0,30
Gains from 51+	3 675	3 423	3 129	2 803	2 376	2 088	1 906	1 755	1 635	1 516	1 397	1 280	1 154	1 121	1 078	1 020	981	907	888	863	34 995
Closed	1 774	1 130	881	738	568	413	331	259	236	200	172	147	107	106	119	89	106	62	86	85	7 609
Held	1 901	2 293	2 248	2 065	1 808	1 675	1 575	1 496	1 399	1 316	1 225	1 133	1 047	1 015	959	931	875	845	802	778	27 386
PGR 51+	0,48	0,33	0,28	0,26	0,24	0,20	0,17	0,15	0,14	0,13	0,12	0,11	0,09	0,09	0,11	0,09	0,11	0,07	0,10	0,10	0,22

Source: own work.

TABLE 6. Transactions by point range and day (from last settlement – ID)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ1-20
Losses from 0 to -9	22 616	10 097	6 941	4 977	3 959	3 259	2 591	2 273	1 899	1 738	1 535	1 250	1 147	971	910	835	810	781	676	595	69 860
Closed	12 454	3 197	1 639	979	673	472	329	317	252	172	154	119	104	94	89	58	57	58	50	53	21 320
Held	10 162	6 900	5 302	3 998	3 286	2 787	2 262	1 956	1 647	1 566	1 381	1 131	1 043	877	821	777	753	723	626	542	48 540
PLR from 0 to -9	0.55	0.32	0.24	0.20	0.17	0.14	0.13	0.14	0.13	0.10	0.10	0.10	0.09	0.10	0.10	0.07	0.07	0.07	0.07	0.09	0.31
Losses from -10 to -19	15 599	7 564	4 554	3 666	2 992	2 224	1 916	1 666	1 451	1 311	1 079	997	947	865	703	650	567	507	461	454	50 173
Closed	7 008	2 308	1 009	640	517	305	240	188	136	135	82	89	58	59	51	42	46	31	24	33	13 001
Held	8 591	5 256	3 545	3 026	2 475	1 919	1 676	1 478	1 315	1 176	997	908	889	806	652	608	521	476	437	421	37 172
PLR from -10 to -19	0.45	0.31	0.22	0.17	0.17	0.14	0.13	0.11	0.09	0.10	0.08	0.09	0.06	0.07	0.07	0.06	0.08	0.06	0.05	0.07	0.26
Losses from -20 to -29	9 075	4 840	3 343	2 490	1 960	1 633	1 321	1 009	958	842	712	706	530	498	442	419	373	396	297	237	32 081
Closed	3 404	1 166	603	388	251	218	141	111	80	77	69	67	46	55	18	30	30	30	23	20	6 827
Held	5 671	3 674	2 740	2 102	1 709	1 415	1 180	898	878	765	643	639	484	443	424	389	343	366	274	217	25 254
PLR from -20 to -29	0.38	0.24	0.18	0.16	0.13	0.13	0.11	0.11	0.08	0.09	0.10	0.09	0.09	0.11	0.04	0.07	0.08	0.08	0.08	0.08	0.21
Losses from -30 to -39	5 081	2 617	1 840	1 384	1 018	799	716	620	470	423	409	365	359	317	244	239	210	158	178	220	17 667
Closed	1 554	495	316	259	172	83	94	58	36	32	47	35	23	23	22	21	22	17	20	16	3 345
Held	3 527	2 122	1 524	1 125	846	716	622	562	434	391	362	330	336	294	222	218	188	141	158	204	14 322
PLR from -30 to -39	0.31	0.19	0.17	0.19	0.17	0.10	0.13	0.09	0.08	0.08	0.11	0.10	0.06	0.07	0.09	0.09	0.10	0.11	0.11	0.07	0.19
Losses from -40 to -49	2 953	1 639	1 037	784	658	562	525	433	347	257	277	215	215	183	151	151	161	126	117	84	10 875
Closed	747	300	161	123	82	51	38	56	34	34	35	19	20	14	15	8	13	10	7	4	1 771
Held	2 206	1 339	876	661	576	511	487	377	313	223	242	196	195	169	136	143	148	116	110	80	9 104
PLR from -40 to -49	0.25	0.18	0.16	0.16	0.12	0.09	0.07	0.13	0.10	0.13	0.13	0.09	0.09	0.08	0.10	0.05	0.08	0.08	0.06	0.05	0.16
Losses 50+	3 697	1 997	1 382	1 135	865	701	651	539	388	343	278	251	250	189	205	157	168	167	139	160	13 662
Closed	919	331	183	151	137	81	67	60	31	24	26	24	18	17	19	9	15	13	10	12	2 147
Held	2 778	1 666	1 199	984	728	620	584	479	357	319	252	227	232	172	186	148	153	154	129	148	11 515
PLR from -40 to -49	0.25	0.17	0.13	0.13	0.16	0.12	0.10	0.11	0.08	0.07	0.09	0.10	0.07	0.09	0.09	0.06	0.09	0.08	0.07	0.08	0.16

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Σ1-20
Gains from 1 to 10	27 435	10 511	7 276	5 099	3 931	3 020	2 710	2 316	1 798	1 676	1 456	1 209	1 010	964	941	801	728	665	631	504	74 681
Closed	18 242	4 159	2 024	1 316	889	521	430	327	304	246	203	159	111	89	74	70	67	53	67	45	29 396
Held	9 193	6 352	5 252	3 783	3 042	2 499	2 280	1 989	1 494	1 430	1 253	1 050	899	875	867	731	661	612	564	459	45 285
PGR from 1 to 10	0,66	0,40	0,28	0,26	0,23	0,17	0,16	0,14	0,17	0,15	0,14	0,13	0,11	0,09	0,08	0,09	0,09	0,08	0,11	0,09	0,39
Gains from 11 to 20	17 812	8 336	5 565	4 147	3 150	2 557	1 974	1 796	1 659	1 337	1 156	1 018	912	875	750	685	618	543	533	520	55 943
Closed	11 311	3 343	1 825	1 203	781	550	422	306	255	232	186	110	93	90	76	60	64	47	59	35	21 048
Held	6 501	4 993	3 740	2 944	2 369	2 007	1 552	1 490	1 404	1 105	970	908	819	785	674	625	554	496	474	485	34 895
PGR from 11 to 20	0,64	0,40	0,33	0,29	0,25	0,22	0,21	0,17	0,15	0,17	0,16	0,11	0,10	0,10	0,10	0,09	0,10	0,09	0,11	0,07	0,38
Gains from 21 to 30	8 927	4 760	3 167	2 509	1 905	1 560	1 295	1 052	972	864	674	624	562	536	472	474	402	306	374	271	31 706
Closed	4 731	1 789	1 006	638	442	358	273	195	166	139	93	63	52	60	56	40	40	30	25	20	10 216
Held	4 196	2 971	2 161	1 871	1 463	1 202	1 022	857	806	725	581	561	510	476	416	434	362	276	349	251	21 490
PGR from 21 to 30	0,53	0,38	0,32	0,25	0,23	0,23	0,21	0,19	0,17	0,16	0,14	0,10	0,09	0,11	0,12	0,08	0,10	0,10	0,07	0,07	0,32
Gains from 31 to 40	3 981	2 457	1 653	1 233	969	879	647	528	514	398	408	372	314	317	278	232	228	194	159	142	15 903
Closed	1 967	877	559	333	231	197	133	96	84	72	61	64	56	50	35	29	30	19	20	15	4 928
Held	2 014	1 580	1 094	900	738	682	514	432	430	326	347	308	258	267	243	203	198	175	139	127	10 975
PGR from 31 to 40	0,49	0,36	0,34	0,27	0,24	0,22	0,21	0,18	0,16	0,18	0,15	0,17	0,18	0,16	0,13	0,13	0,13	0,10	0,13	0,11	0,31
Gains from 41 to 50	2 180	1 338	1 002	742	622	485	439	325	324	206	193	220	189	156	168	118	114	112	112	137	9 182
Closed	957	381	237	150	130	88	85	58	44	29	18	17	14	12	22	12	17	8	12	22	2 313
Held	1 223	957	765	592	492	397	354	267	280	177	175	203	175	144	146	106	97	104	100	115	6 869
PGR from 41 to 50	0,44	0,28	0,24	0,20	0,21	0,18	0,19	0,18	0,14	0,14	0,09	0,08	0,07	0,08	0,13	0,10	0,15	0,07	0,11	0,16	0,25
Gains from 51+	2 255	1 267	989	775	556	505	401	337	308	245	241	185	197	145	167	182	166	151	106	117	9 295
Closed	894	328	246	176	96	74	40	34	26	30	32	14	21	22	11	19	38	7	25	16	2 149
Held	1 361	939	743	599	460	431	361	303	282	215	209	171	176	123	156	163	128	144	81	101	7 146
PGR 51+	0,40	0,26	0,25	0,23	0,17	0,15	0,10	0,10	0,08	0,12	0,13	0,08	0,11	0,15	0,07	0,10	0,23	0,05	0,24	0,14	0,23

Source: own work.