

Appendix

Table 1

Standard deviation and chain dynamics index of selected financial analysis indicators in the period of 4 years before the announcement of enterprise bankruptcy (2007–2013)

Financial analysis indicator		[W1]		[W2]		[W3]		[W4]		[W5]		[W6]		[W7]	
Year	Time advance	Standard deviation	Dynamics index	Standard deviation	Dynamics index	Standard deviation	Dynamics index	Standard deviation	Dynamics index	Standard deviation	Dynamics index	Standard deviation	Dynamics index	Standard deviation	Dynamics index
2007	t ₍₋₄₎	0.47	100.0%	1.40	100.0%	nd.	nd.	nd.	nd.	nd.	nd.	0.16	nd.	nd.	nd.
	t ₍₋₃₎	0.40	83.6%	0.39	28.1%	nd.	nd.	nd.	nd.	nd.	nd.	0.13	nd.	nd.	nd.
	t ₍₋₂₎	0.40	100.2%	0.51	130.5%	nd.	nd.	nd.	nd.	nd.	nd.	0.16	nd.	nd.	nd.
	t ₍₋₁₎	0.31	78.1%	0.84	164.4%	nd.	nd.	nd.	nd.	nd.	nd.	0.32	nd.	nd.	nd.
2008	t ₍₋₄₎	7.64	100.0%	0.40	100.0%	1.53	100.0%	73.61	100.0%	394.35	100.0%	0.42	100.0%	2.27	100.0%
	t ₍₋₃₎	0.59	7.7%	0.42	107.2%	0.21	13.8%	64.00	86.9%	246.43	62.5%	0.12	28.4%	1.53	67.3%
	t ₍₋₂₎	0.42	71.5%	0.59	139.2%	0.16	77.2%	58.76	91.8%	271.68	110.2%	0.10	86.5%	1.50	98.0%
	t ₍₋₁₎	0.44	104.8%	0.88	149.1%	0.21	126.7%	75.33	128.2%	366.75	135.0%	0.23	216.8%	1.49	99.8%
2009	t ₍₋₄₎	1.40	100.0%	0.29	100.0%	0.35	100.0%	596.81	100.0%	411.80	100.0%	0.26	100.0%	1.32	100.0%
	t ₍₋₃₎	0.43	30.6%	0.30	102.3%	0.17	49.2%	34.92	5.9%	93.64	22.7%	0.08	32.1%	1.29	98.4%
	t ₍₋₂₎	0.43	100.4%	0.37	123.9%	0.15	90.2%	36.97	105.9%	108.64	116.0%	0.09	109.8%	1.13	87.0%
	t ₍₋₁₎	0.39	90.3%	0.61	165.9%	0.21	134.3%	52.04	140.8%	168.36	155.0%	0.16	167.1%	1.02	90.2%
2010	t ₍₋₄₎	0.63	100.0%	0.28	100.0%	0.38	100.0%	80.56	100.0%	256.25	100.0%	0.21	100.0%	1.49	100.0%
	t ₍₋₃₎	0.48	75.7%	0.22	81.6%	0.13	33.6%	55.42	68.8%	97.48	38.0%	0.08	39.0%	1.38	92.9%
	t ₍₋₂₎	0.44	91.6%	0.25	111.7%	0.18	138.5%	46.12	83.2%	104.03	106.7%	0.12	144.0%	1.28	92.8%
	t ₍₋₁₎	0.39	90.0%	0.72	285.5%	0.24	135.8%	65.40	141.8%	250.37	240.7%	0.23	199.1%	1.10	86.1%
2011	t ₍₋₄₎	1.37	100.0%	0.29	100.0%	1.80	100.0%	8733.49	100.0%	603.75	100.0%	6.97	100.0%	1.49	100.0%
	t ₍₋₃₎	0.52	38.0%	0.32	109.5%	0.17	9.5%	45.07	0.5%	243.81	40.4%	0.19	2.7%	1.13	75.8%
	t ₍₋₂₎	0.47	89.2%	0.39	122.0%	0.15	85.5%	79.33	176.0%	330.01	135.4%	0.23	121.7%	1.05	92.7%
	t ₍₋₁₎	0.42	90.6%	0.79	203.2%	0.20	137.3%	113.95	143.6%	1083.96	328.5%	0.30	133.6%	1.04	99.0%
2012	t ₍₋₄₎	2.20	100.0%	0.36	100.0%	0.26	100.0%	230.79	100.0%	174.20	100.0%	0.07	100.0%	1.76	100.0%
	t ₍₋₃₎	0.47	21.4%	0.23	62.5%	0.14	53.8%	60.81	26.3%	188.12	108.0%	0.12	170.1%	1.26	71.5%
	t ₍₋₂₎	0.41	88.2%	0.25	109.6%	0.16	112.5%	67.38	110.8%	190.32	101.2%	0.11	93.6%	1.14	90.8%
	t ₍₋₁₎	0.41	99.0%	0.50	200.5%	0.19	115.7%	72.27	107.3%	236.00	124.0%	0.18	162.2%	1.09	95.6%
2013	t ₍₋₄₎	0.64	100.0%	0.23	100.0%	0.20	100.0%	108.05	100.0%	770.94	100.0%	0.38	100.0%	1.23	100.0%
	t ₍₋₃₎	0.42	66.0%	0.18	81.3%	0.13	65.6%	43.76	40.5%	104.19	13.5%	0.09	23.2%	0.98	79.3%
	t ₍₋₂₎	0.38	89.7%	0.21	113.3%	0.12	88.8%	48.71	111.3%	143.20	137.4%	0.11	124.9%	0.94	96.8%
	t ₍₋₁₎	0.41	109.1%	0.65	314.0%	0.22	188.2%	83.97	172.4%	279.41	195.1%	0.25	223.2%	0.92	97.9%
Average standard deviation	t ₍₋₄₎	2.05	100.0%	0.46	100.0%	0.76	100.0%	1637.22	100.0%	435.22	100.0%	1.21	100.0%	1.59	100.0%
	t ₍₋₃₎	0.47	46.1%	0.30	81.8%	0.16	37.6%	50.66	38.2%	162.28	47.5%	0.12	49.2%	1.26	80.9%
	t ₍₋₂₎	0.42	90.1%	0.37	121.5%	0.15	98.8%	56.21	113.2%	191.31	117.8%	0.13	113.4%	1.17	93.0%
	t ₍₋₁₎	0.40	94.6%	0.71	211.8%	0.21	139.7%	77.16	139.0%	397.47	196.4%	0.24	183.7%	1.11	94.8%
Deviation from standard deviation	t ₍₋₄₎	2.37	100.0%	0.39	100.0%	0.66	100.0%	3183.92	100.0%	166.47	100.0%	2.37	100.0%	0.40	100.0%
	t ₍₋₃₎	0.07	2.9%	0.08	20.3%	0.03	4.7%	9.85	0.3%	62.47	37.5%	0.03	1.3%	0.18	46.2%
	t ₍₋₂₎	0.02	30.4%	0.15	187.0%	0.03	82.1%	16.84	170.9%	86.43	138.3%	0.06	180.2%	0.18	98.3%
	t ₍₋₁₎	0.58	2820.6%	0.15	103.7%	0.20	796.5%	582.21	3457.6%	308.17	356.6%	0.35	603.2%	0.23	127.1%

Source: authors' own work.

Table 2

The average and the median of selected financial analysis indicators in the period of 4 years before the announcement of enterprise bankruptcy (2007–2013)

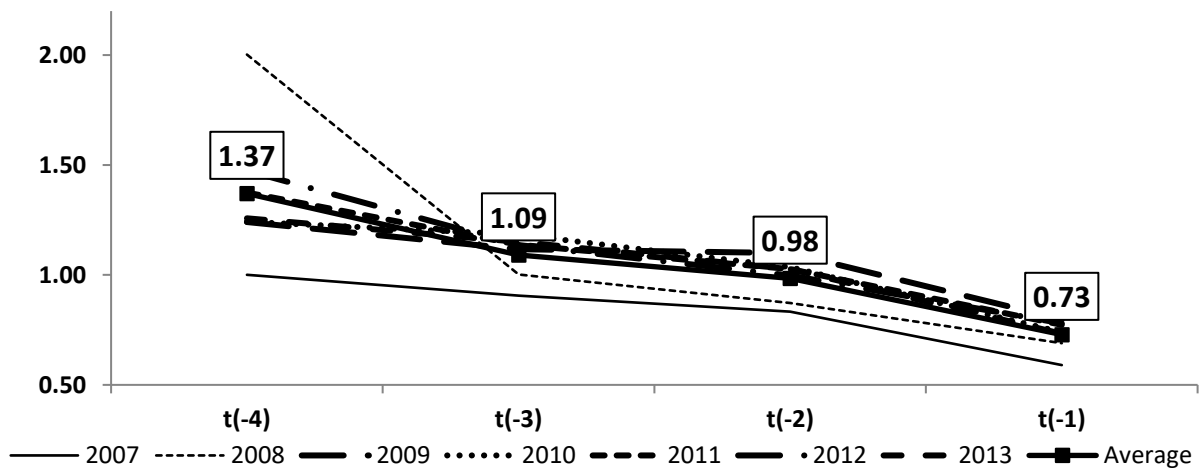
Financial analysis indicator		[W1]		[W2]		[W3]		[W4]		[W5]		[W6]		[W7]	
Year	Time advance	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median	Average	Median
2007	t(-4)	1.00	98.9%	1.01	82.4%	nd.	nd.	nd.	nd.	nd.	nd.	-0.02	0.01	nd.	nd.
	t(-3)	0.91	95.5%	0.91	80.7%	nd.	nd.	nd.	nd.	nd.	nd.	-0.05	0.00	nd.	nd.
	t(-2)	0.83	79.5%	1.01	82.8%	nd.	nd.	nd.	nd.	nd.	nd.	-0.07	-0.02	nd.	nd.
	t(-1)	0.59	52.6%	1.41	112.6%	nd.	nd.	nd.	nd.	nd.	nd.	-0.21	-0.09	nd.	nd.
2008	t(-4)	2.00	100.6%	0.80	79.3%	0.18	3.9%	76.29	5192.8%	219.48	11318.0%	-0.07	1.2%	2.49	203.4%
	t(-3)	1.00	91.3%	0.90	82.3%	-0.05	0.6%	77.74	5947.8%	203.81	11959.9%	-0.05	-0.7%	2.07	174.9%
	t(-2)	0.87	83.6%	0.96	81.9%	-0.04	-1.1%	73.20	5794.6%	234.93	14109.7%	-0.04	-0.5%	2.00	160.9%
	t(-1)	0.69	58.2%	1.29	101.1%	-0.15	-13.3%	76.90	5659.3%	305.82	15407.6%	-0.15	-7.4%	1.93	163.3%
2009	t(-4)	1.24	109.8%	0.74	74.7%	0.06	5.8%	117.99	5766.5%	151.68	8557.1%	-0.03	1.4%	2.84	276.8%
	t(-3)	1.12	108.8%	0.78	76.8%	0.09	5.6%	62.05	5308.4%	120.99	9281.0%	-0.01	1.4%	2.65	257.5%
	t(-2)	1.10	105.6%	0.81	75.4%	0.04	4.7%	65.54	5728.8%	139.28	10665.9%	-0.02	0.9%	2.32	214.3%
	t(-1)	0.80	78.7%	1.10	92.4%	-0.17	-15.4%	79.24	6905.3%	202.34	14276.6%	-0.11	-6.5%	1.96	175.2%
2010	t(-4)	1.24	108.7%	0.74	76.2%	0.05	4.3%	76.10	5940.1%	154.84	9855.9%	-0.02	1.0%	2.47	221.4%
	t(-3)	1.18	108.7%	0.75	77.8%	0.05	6.0%	68.71	5121.0%	134.68	10506.1%	-0.01	1.0%	2.39	212.1%
	t(-2)	1.04	103.7%	0.82	81.3%	-0.05	1.8%	65.25	5368.7%	144.73	10797.2%	-0.05	-1.0%	2.28	218.4%
	t(-1)	0.74	70.8%	1.21	97.7%	-0.23	-17.0%	84.67	6014.1%	269.61	19345.8%	-0.20	-11.1%	1.68	153.2%
2011	t(-4)	1.37	107.9%	0.74	75.0%	-0.09	5.5%	907.54	6664.1%	251.91	10801.9%	-0.66	1.7%	2.36	221.8%
	t(-3)	1.14	109.1%	0.80	76.3%	0.03	3.8%	74.06	6415.5%	176.10	10920.3%	-0.05	1.0%	2.14	199.8%
	t(-2)	1.03	102.5%	0.87	80.7%	-0.03	1.6%	94.95	7076.6%	262.70	14788.4%	-0.08	-0.1%	1.71	159.6%
	t(-1)	0.77	74.7%	1.23	94.3%	-0.17	-12.3%	115.09	7684.0%	509.33	21336.1%	-0.19	-9.0%	1.47	138.4%
2012	t(-4)	1.47	116.0%	0.70	68.1%	0.08	5.5%	86.97	5748.5%	137.90	9113.4%	0.01	1.5%	2.25	197.7%
	t(-3)	1.14	111.2%	0.72	71.7%	0.03	3.5%	79.33	6670.1%	167.74	11284.1%	-0.03	0.7%	1.91	177.2%
	t(-2)	1.00	99.4%	0.80	77.4%	-0.03	1.5%	81.03	6080.9%	190.52	13572.5%	-0.04	-0.2%	1.71	152.8%
	t(-1)	0.78	77.8%	1.04	92.7%	-0.15	-11.6%	85.76	6528.3%	253.49	17194.4%	-0.12	-6.3%	1.54	136.4%
2013	t(-4)	1.26	115.8%	0.69	67.6%	0.05	4.3%	78.14	5846.8%	193.80	10167.3%	-0.03	1.3%	2.22	208.8%
	t(-3)	1.15	110.6%	0.72	71.4%	0.03	3.7%	68.49	5685.6%	140.81	10834.3%	-0.03	0.5%	1.99	184.6%
	t(-2)	1.03	99.2%	0.79	76.5%	-0.02	1.6%	77.48	6461.0%	173.01	13187.7%	-0.04	-0.4%	1.85	175.4%
	t(-1)	0.73	68.0%	1.15	93.6%	-0.21	-17.6%	107.60	8187.5%	295.68	18537.3%	-0.18	-12.0%	1.49	133.2%
Average for the years (2007-2013)	t(-4)	1.37	108.2%	0.77	74.8%	0.06	4.9%	87.10	5859.8%	184.94	9968.9%	-0.03	1.2%	2.44	221.6%
	t(-3)	1.09	105.0%	0.80	76.7%	0.03	3.9%	71.73	5858.1%	157.36	10797.6%	-0.03	0.5%	2.19	201.0%
	t(-2)	0.98	96.2%	0.87	79.4%	-0.02	1.7%	76.24	6085.1%	190.86	12853.6%	-0.05	-0.4%	1.98	180.2%

	t(-1)	0.73	68.7%	1.20	97.8%	-0.18	-14.6%	91.54	6829.8%	306.04	17682.9%	-0.17	-8.8%	1.68	150.0%
Dynamics index $t_{(-4)} = 100\%$	t(-4)	1.00	100.0%	1.00	100.0%	1.00	100.0%	1.00	100.0%	1.00	100.0%	1.00	100.0%	1.00	100.0%
	t(-3)	0.80	97.0%	1.03	102.6%	0.50	79.5%	0.82	100.0%	0.85	108.3%	1.16	43.2%	0.90	90.7%
	t(-2)	0.72	88.9%	1.12	106.2%	-0.39	34.8%	0.88	103.8%	1.03	128.9%	1.79	-34.5%	0.81	81.3%
	t(-1)	0.53	63.5%	1.56	130.8%	-3.29	-298.6%	1.05	116.6%	1.65	177.4%	6.22	-712.5%	0.69	67.7%

Source: authors' own work.

Figure 1

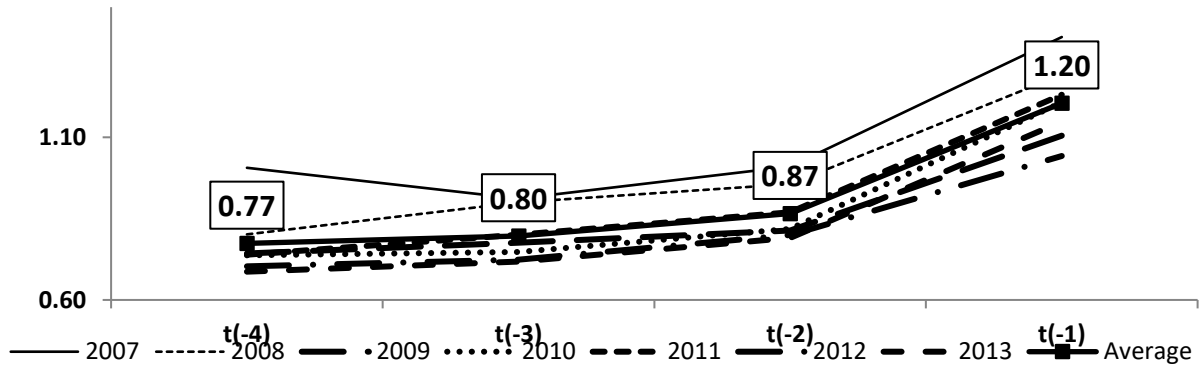
The average value of the liquidity ratio [W1] in the period of 4 years before the bankruptcy announcement of separately analyzed sets of enterprise bankruptcy from the years: 2007–2013, and the average $[W1]_{t-4-t-1}$ for the entire researched period



Source: authors' own work.

Figure 2

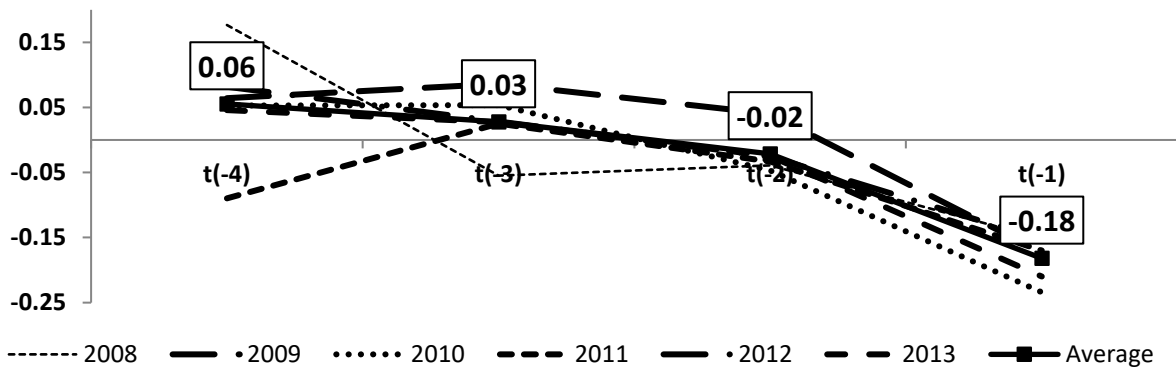
The average value of the debt ratio [W2] in the period of 4 years before the bankruptcy announcement of separately analyzed sets of enterprise bankruptcy from the years: 2007–2013, and the average [W2]_{t-4-t-1} for the entire researched period



Source: authors' own work.

Figure 3

The average value of the adjusted capital debt repayment capacity ratio [W3] in the period of 4 years before the bankruptcy announcement of separately analyzed sets of enterprise bankruptcy from the years: 2007–2013, and the average [W3]_{t-4-t-1} for the entire researched period

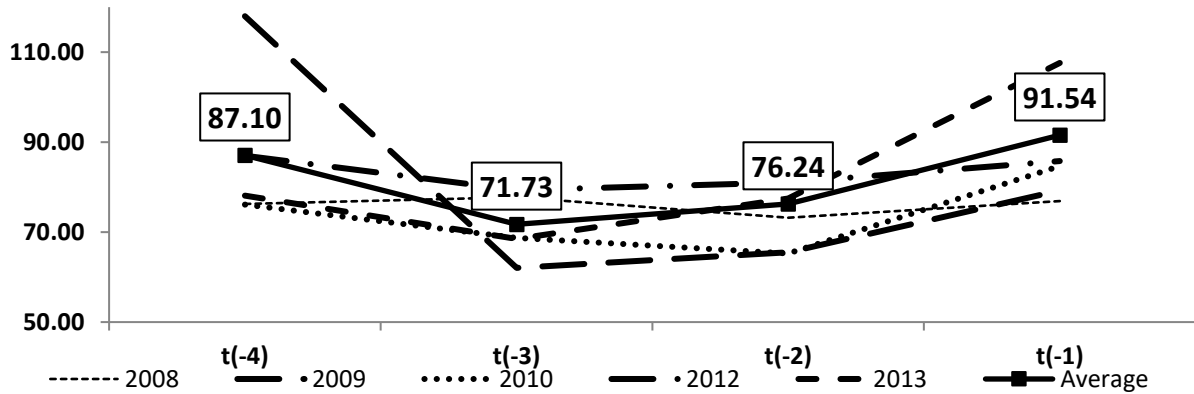


Note. Lack of complete data in the set of the bankruptcies announced in 2007.

Source: authors' own work.

Figure 4

The average value of the receivables turnover ratio (in days) [W4] in the period of 4 years before the bankruptcy announcement of separately analyzed sets of enterprise bankruptcy from the years: 2007–2013, and the average [W4]_{t-4-t-1} for the entire researched period



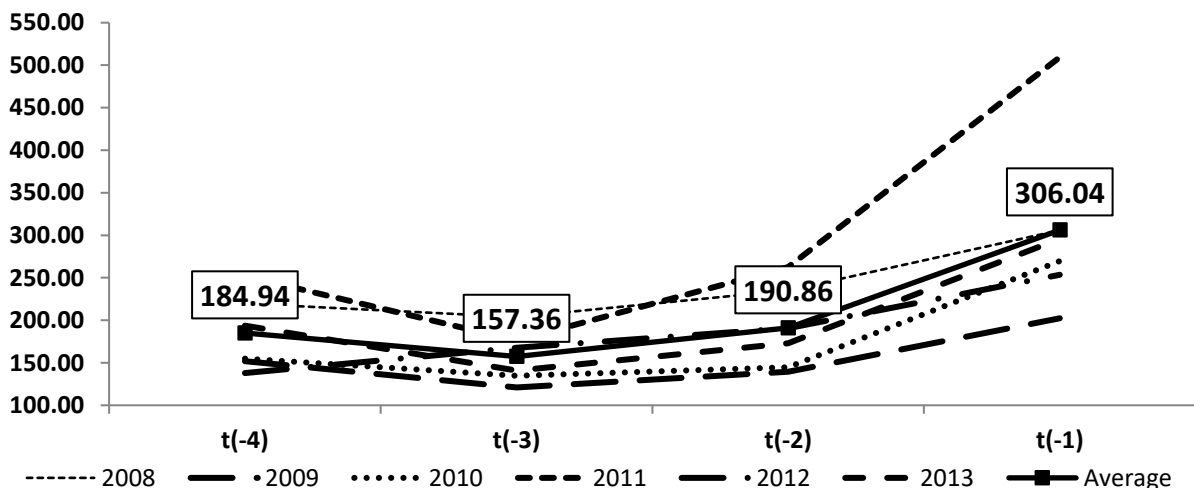
Note.

- (1) lack of complete data in the set of the bankruptcies announced in 2007
- (2) due to the occurrence of an atypical (extreme) value of the [W4] indicator for the period $t_{-4(2011)} = 908$ days (see: table 2) – the value for this period was removed from the graph as well as omitted in the determination of the average $[W4]_{t-4(2011)}$.

Source: authors' own work.

Figure 5

The average value of the debt turnover ratio (in days) [W5] in the period of 4 years before the bankruptcy announcement of separately analyzed sets of enterprise bankruptcy from the years: 2007–2013, and the average [W5]_{t-4-t-1} for the entire researched period

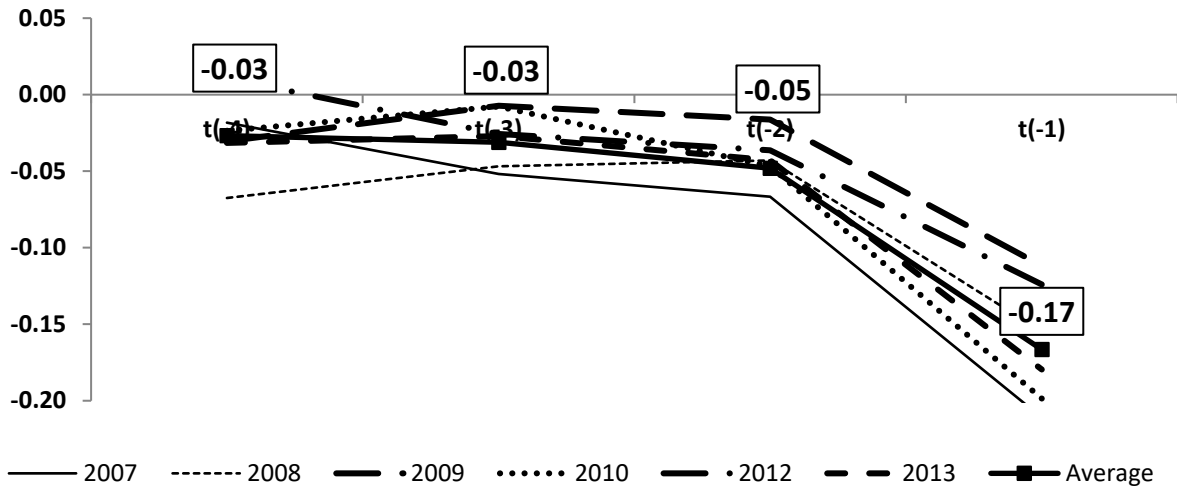


Note. Lack of complete data in the set of the bankruptcies announced in 2007.

Source: authors' own work.

Figure 6

The average value of the return on sales ratio (in days) [W6] in the period of 4 years before the bankruptcy announcement of separately analyzed sets of enterprise bankruptcy from the years: 2007–2013, and the average [W6]_{t-4-t-1} for the entire researched period

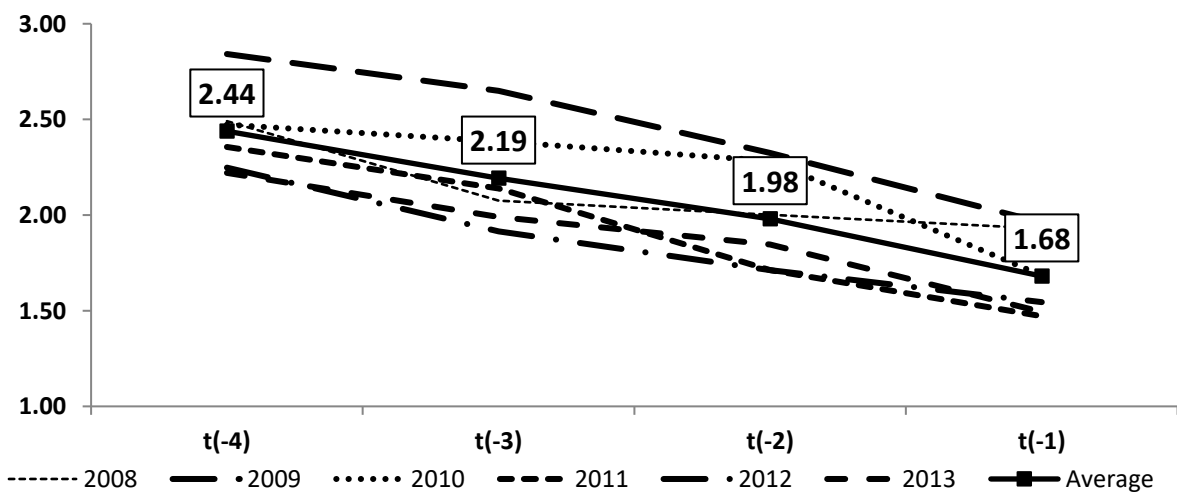


Note. Due to the occurrence of an atypical (extreme) value of the [W6] indicator for the period $t_{-4(2011)} = (-0,66)$ (see: table 2) – the value for this period was removed from the graph as well as omitted in the determination of the average $[W6]_{t-4(2011)}$.

Source: authors' own work.

Figure 7

The average value of the asset productivity ratio (in days) [W7] in the period of 4 years before the bankruptcy announcement of separately analyzed sets of enterprise bankruptcy from the years: 2007–2013, and the average [W7]_{t-4-t-1} for the entire researched period

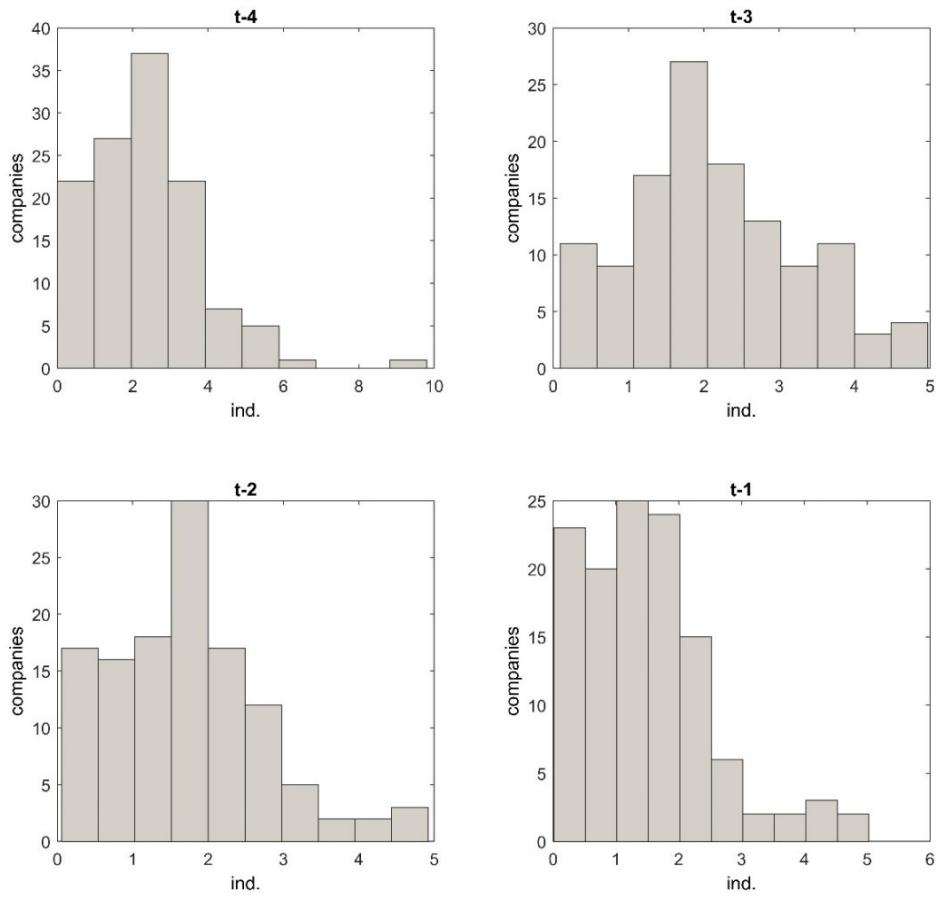


Note. Lack of complete data in the set of the bankruptcies announced in 2007.

Source: authors' own work.

Figure 8

Distribution of the asset productivity ratio (in days) [W7] for enterprises that went bankrupt in 2012, for periods $t-4, t-3, t-2$ and $t-1$



Source: authors' own work.