

## BASIC DEFINITIONS

**A/R turnover** (in days) =  $365/(\text{sales}/\text{average A/R})$

**Inventory turnover** (in days) =  $365/(\text{COGS}/\text{average inventory})$

**A/P turnover** (in days) =  $365/(\text{COGS}/\text{average A/P})$

**Current ratio** =  $(\text{current assets} - \text{ST deferred assets})/\text{current liabilities}$

**Quick ratio** =  $(\text{current assets} - \text{ST deferred assets} - \text{inventory})/\text{current liabilities}$

**Interest coverage** =  $(\text{pre-tax profit before extraordinary items} + \text{interest payable})/\text{interest payable}$

**Gross margin** = gross profit on sales/sales

**EBITDA margin** = EBITDA/sales

**EBIT margin** = EBIT/sales

**Pre-tax margin** = pre-tax profit/sales

**Net margin** = net profit/sales

**ROE** = net profit/average equity

**ROA** =  $(\text{net income} + \text{interest payable})/\text{average assets}$

**EV** = market capitalization + interest bearing debt – cash and equivalents

**EPS** = net profit/ no. of shares outstanding

**CE** = net profit + depreciation

**Dividend yield** (gross) = pre-tax DPS/stock market price

**Cash sales** = accrual sales corrected for the change in A/R

**Cash operating expenses** = accrual operating expenses corrected for the changes in inventories and A/P, depreciation, cash taxes and changes in the deferred taxes

DM BOŠ S.A. generally values the covered non bank companies via two methods: comparative method and DCF method (discounted cash flows). The advantage of the former is the fact that it incorporates the current market assessment of the value of the company's peers. The weakness of the comparative method is the risk that the valuation benchmark may be mispriced. The advantage of the DCF method is its independence from the current market valuation of the comparable companies. The weakness of this method is its high sensitivity to undertaken assumptions, especially those related to the residual value calculation. Please note that we also resort to other valuation techniques (e.g. NAV-, DDM- or SOTP-based), should it prove appropriate in a given case.

## KEY TO INVESTMENT RANKINGS

This is a guide to expected price performance in absolute terms over the next 12 months:

**Buy** – fundamentally undervalued (upside to 12M EFV in excess of the cost of equity) + catalysts which should close the valuation gap identified;

**Hold** – either (i) fairly priced, or (ii) fundamentally undervalued/overvalued but lacks catalysts which could close the valuation gap;

**Sell** – fundamentally overvalued (12M EFV < current share price + 1-year cost of equity) + catalysts which should close the valuation gap identified.

This is a guide to expected relative price performance:

**Overweight** – expected to perform better than the benchmark (WIG) over the next quarter in relative terms

**Neutral** – expected to perform in line with the benchmark (WIG) over the next quarter in relative terms

**Underweight** – expected to perform worse than the benchmark (WIG) over the next quarter in relative terms

The recommendation tracker presents the performance of DM BOŠ S.A.'s recommendations. A recommendation expires on the day it is altered or on the day 12 months after its issuance, whichever comes first.

Relative performance compares the rate of return on a given recommended stock in the period of the recommendation's validity (i.e. from the date of issuance to the date of alteration or – in case of maintained recommendations – from the date of issuance to the current date) in a relation to the rate of return on the benchmark in this time period. The WIG index constitutes the benchmark. For recommendations that expire by an alteration or are maintained, the ending values used to calculate their absolute and relative performance are: the stock closing price on the day the recommendation expires/ is maintained and the closing value of the benchmark on that date. For recommendations that expire via a passage of time, the ending values used to calculate their absolute and relative performance are: the average of the stock closing prices for the day the recommendation elapses and four directly preceding sessions and the average of the benchmark's closing values for the day the recommendation expires and four directly preceding sessions.

### Distribution of DM BOŠ's current recommendations

	Buy	Hold	Sell	Suspended	Under revision
Numbers	30	38	8	9	0
Percentage	35%	45%	9%	11%	0%

### Distribution of DM BOŠ's current market relative recommended weightings

	Overweight	Neutral	Underweight	Suspended	Under revision
Numbers	31	28	17	9	0
Percentage	36%	33%	20%	11%	0%

## Banks

**Net Interest Margin (NIM)** = net interest income/average assets

**Non interest income** = fees&commissions + result on financial operations (trading gains) + FX gains

**Interest Spread** =  $(\text{interest income}/\text{average interest earning assets})/(\text{interest cost}/\text{average interest bearing liabilities})$

**Cost/Income** =  $(\text{general costs} + \text{depreciation})/(\text{profit on banking activity} + \text{other net operating income})$

**ROE** = net profit/average equity

**ROA** = net income/average assets

**Non performing loans (NPL)** = loans in 'basket 3' category

**NPL coverage ratio** = loan loss provisions/NPL

**Net provision charge** = provisions created – provisions released

DM BOŠ S.A. generally values the covered banks via two methods: comparative method and fundamental target fair P/E and target fair P/BV multiples method. The advantage of the former is the fact that it incorporates the current market assessment of the value of the company's peers. The weakness of the comparative method is the risk that the valuation benchmark may be mispriced. The advantage of the fundamental target fair P/E and target fair P/BV multiples method is its independence of the current market valuation of the comparable companies. The weakness of this method is its high sensitivity to undertaken assumptions, especially those related to the residual value calculation. Assumptions used in valuation can change, influencing thereby the level of the valuation. Among the most important assumptions are: GDP growth, forecasted level of inflation, changes in interest rates and currency prices, employment level and change in wages, demand on the analysed company products, raw material prices, competition, standing of the main customers and suppliers, legislation changes, etc. Changes in the environment of the analysed company are monitored by analysts involved in the preparation of the recommendation, estimated, incorporated in valuation and published in the recommendation whenever needed.

### Distribution of DM BOŠ's current recommendations for the companies which DM BOŠ has supplied with material investment services within the last 12 months

	Buy	Hold	Sell	Suspended	Under revision
Numbers	3	9	0	2	0
Percentage	21%	64%	0%	14%	0%

### Distribution of DM BOŠ's current market relative recommended weightings for the companies which DM BOŠ has supplied with material investment services within the last 12 months

	Overweight	Neutral	Underweight	Suspended	Under revision
Numbers	3	6	3	2	0
Percentage	21%	43%	21%	14%	0%

LT fundamental recommendation tracker

Analyst	Recommendation		Report date	Reiteration date	Distribution date	Expiry date	Performance	Relative performance	Price at issue/ reiteration*	EFV (12 months)	
Asseco BS											
-	Hold	→	7.02.2008	-	-	11.05.2008	0%	1%	12.50	13.20	→
-	-	→	-	21.02.2008	-	-	-	-	13.50	14.20	↑
-	-	→	-	13.03.2008	-	-	-	-	13.30	14.10	↓
-	-	→	-	30.03.2008	-	-	-	-	12.67	14.00	↓
-	-	→	-	08.04.2008	-	-	-	-	12.66	14.00	→
-	Buy	↑	11.05.2008	-	-	09.11.2008	-30%	18%	12.50	14.60	↑
-	-	→	-	01.06.2008	-	-	-	-	12.97	14.60	→
-	-	→	-	29.06.2008	-	-	-	-	11.45	14.50	↓
-	-	→	-	02.07.2008	-	-	-	-	11.30	14.30	↓
-	-	→	-	28.07.2008	-	-	-	-	10.40	14.30	→
-	-	→	-	07.08.2008	-	-	-	-	11.30	14.30	→
-	-	→	-	31.08.2008	-	-	-	-	12.45	14.30	→
-	-	→	-	28.09.2008	-	-	-	-	10.80	14.30	→
-	-	→	-	01.10.2008	-	-	-	-	10.00	12.80	↓
-	-	→	-	29.10.2008	-	-	-	-	8.55	12.80	→
-	Hold	↓	09.11.2008	-	-	07.01.2009	-41%	-41%	8.80	10.30	↓
-	-	→	-	30.11.2008	-	-	-	-	8.59	10.30	→
-	-	→	-	15.12.2008	-	-	-	-	6.20	9.30	↓
-	Buy	↑	07.01.2009	-	-	24.02.2009	40%	86%	5.20	9.30	→
-	-	→	-	11.01.2009	-	-	-	-	5.34	9.30	→
-	-	→	-	08.02.2009	-	-	-	-	6.39	9.30	→
-	Hold	↓	24.02.2009	-	-	05.11.2009	11%	-39%	7.29	8.80	↓
-	-	→	-	08.03.2009	-	-	-	-	6.00	8.80	→
-	-	→	-	05.04.2009	-	-	-	-	5.95	8.80	→
-	-	→	-	14.04.2009	-	-	-	-	5.62	8.30	↓
-	-	→	-	17.05.2009	-	-	-	-	6.80	8.30	→
-	-	→	-	08.06.2009	-	-	-	-	6.70	7.90	↓
-	-	→	-	08.07.2009	-	-	-	-	6.20	7.90	→
-	-	→	-	14.07.2009	-	-	-	-	6.14	6.70	↓
-	-	→	-	02.08.2009	-	-	-	-	6.57	6.70	→
-	-	→	-	24.08.2009	-	-	-	-	7.11	6.70	→
-	-	→	-	31.08.2009	-	-	-	-	7.55	6.70	→
-	-	→	-	06.10.2009	-	-	-	-	8.53	8.70	↑
-	-	→	-	12.10.2009	-	-	-	-	8.12	8.70	→
-	Buy	↑	05.11.2009	-	-	07.01.2010	18%	13%	7.64	9.40	↑
-	-	→	-	08.12.2009	-	-	-	-	7.90	9.40	→
-	-	→	-	14.12.2009	-	-	-	-	8.00	9.40	→
-	Hold	↓	07.01.2010	-	-	30.06.2010	8%	12%	9.05	9.80	↑
-	-	→	-	03.02.2010	-	-	-	-	8.79	9.80	→
-	-	→	-	01.03.2010	-	-	-	-	9.25	9.80	→
-	-	→	-	29.03.2010	-	-	-	-	9.99	9.80	→
-	-	→	-	31.03.2010	-	-	-	-	9.82	10.40	↑
-	-	→	-	05.05.2010	-	-	-	-	10.00	9.65	↓
-	-	→	-	17.05.2010	-	-	-	-	8.50	9.65	→
-	-	→	-	14.06.2010	-	-	-	-	9.03	9.65	→
-	Buy	↑	30.06.2010	-	-	02.01.2011	44%	19%	9.00	10.50	↑
-	-	→	-	19.07.2010	-	-	-	-	9.20	10.50	→
-	-	→	-	31.08.2010	-	-	-	-	10.00	10.50	→
-	-	→	-	03.10.2010	-	-	-	-	10.70	12.20	↑
-	-	→	-	12.10.2010	-	-	-	-	11.08	12.20	→
-	-	→	-	15.11.2010	-	-	-	-	11.20	12.20	→
-	-	→	-	13.12.2010	-	-	-	-	10.74	12.80	↑
-	-	→	-	15.12.2010	-	-	-	-	11.20	12.80	→
-	Hold	↓	02.01.2011	-	-	11.12.2011	-19%	0%	12.93	12.80	→
-	-	→	-	28.01.2011	-	-	-	-	12.16	12.80	→
-	-	→	-	01.03.2011	-	-	-	-	12.25	12.80	→
-	-	→	-	10.03.2011	-	-	-	-	12.10	12.80	→
-	-	→	-	13.03.2011	-	-	-	-	12.56	14.20	↑
-	-	→	-	24.03.2011	-	-	-	-	12.44	14.20	→
-	-	→	-	20.04.2011	-	-	-	-	13.20	14.20	→
-	-	→	-	11.05.2011	-	-	-	-	13.50	13.30	↓
-	-	→	-	16.05.2011	-	-	-	-	12.30	13.30	→
-	-	→	-	20.06.2011	-	-	-	-	12.08	13.30	→
-	-	→	-	25.07.2011	-	-	-	-	10.92	13.30	→
-	-	→	-	31.08.2011	-	-	-	-	9.90	11.60	↓
-	-	→	-	03.10.2011	-	-	-	-	10.00	11.60	→
-	-	→	-	24.10.2011	-	-	-	-	10.02	11.60	→
-	-	→	-	02.11.2011	-	-	-	-	9.91	11.60	→
-	-	→	-	14.11.2011	-	-	-	-	10.43	11.60	→
-	Hold	→	11.12.2011	-	-	14.11.2012	9%	-4%	9.61	11.60	→
-	-	→	-	01.01.2012	-	-	-	-	9.29	10.50	↓
-	-	→	-	25.01.2012	-	-	-	-	9.52	10.50	→
-	-	→	-	29.02.2012	-	-	-	-	10.50	10.50	→
-	-	→	-	09.03.2012	-	-	-	-	10.22	10.50	→
-	-	→	-	20.03.2012	-	-	-	-	10.75	10.50	→
-	-	→	-	15.04.2012	-	-	-	-	10.55	10.50	→
-	-	→	-	09.05.2012	-	-	-	-	9.60	9.54	↓
-	-	→	-	15.05.2012	-	-	-	-	9.61	9.54	→
-	-	→	-	21.06.2012	-	-	-	-	9.13	9.54	→
-	-	→	-	19.07.2012	-	-	-	-	8.74	9.54	→
-	-	→	-	02.09.2012	-	-	-	-	9.20	9.54	→
-	-	→	-	01.10.2012	-	-	-	-	8.90	9.10	↓
-	-	→	-	10.10.2012	-	-	-	-	8.37	9.10	→

LT fundamental recommendation tracker (continued)

Analyst	Recommendation	Report date	Reiteration date	Distribution date	Expiry date	Performance	Relative performance	Price at issue/reiteration*	EFV (12 months)
-	-	→	-	05.11.2012	-	-	-	9.35	9.10 →
-	-	→	-	06.11.2012	-	-	-	9.80	9.10 →
-	Hold	→	14.11.2012	-	14.11.2013	47%	21%	9.50	9.10 →
-	-	→	-	13.12.2012	-	-	-	10.65	10.20 ↑
-	-	→	-	23.01.2013	-	-	-	10.31	10.20 →
-	-	→	-	18.02.2013	-	-	-	11.09	10.20 →
-	-	→	-	21.03.2013	-	-	-	11.19	10.20 →
-	-	→	-	02.04.2013	-	-	-	11.55	11.60 ↑
-	-	→	-	17.04.2013	-	-	-	11.08	11.60 →
-	-	→	-	13.05.2013	-	-	-	10.70	10.80 ↓
-	-	→	-	15.05.2013	-	-	-	11.39	10.80 →
-	-	→	-	17.06.2013	-	-	-	11.69	10.80 →
-	-	→	-	14.07.2013	-	-	-	10.80	11.70 ↑
-	-	→	-	25.07.2013	-	-	-	11.18	11.70 →
-	-	→	-	01.09.2013	-	-	-	11.98	11.70 →
-	-	→	-	20.10.2013	-	-	-	12.50	11.70 →
-	Hold	→	14.11.2013	-	08.04.2014	-4%	-3%	13.20	11.70 →
-	-	→	-	12.12.2013	-	-	-	12.85	13.80 ↑
-	-	→	-	14.01.2014	-	-	-	13.17	13.80 →
-	-	→	-	21.01.2014	-	-	-	13.29	13.80 →
-	-	→	-	17.02.2014	-	-	-	12.10	13.80 →
-	-	→	-	23.03.2014	-	-	-	12.47	13.80 →
-	Buy	↑	08.04.2014	-	26.03.2015	24%	21%	12.65	14.40 ↑
-	-	→	-	13.04.2014	-	-	-	12.60	14.40 →
-	-	→	-	11.05.2014	-	-	-	12.86	13.60 ↓
-	-	→	-	15.05.2014	-	-	-	12.00	13.60 →
-	-	→	-	16.06.2014	-	-	-	11.59	13.60 →
-	-	→	-	20.07.2014	-	-	-	11.16	13.60 →
-	-	→	-	01.09.2014	-	-	-	11.49	13.60 →
-	-	→	-	07.10.2014	-	-	-	12.00	15.00 ↑
-	-	→	-	14.10.2014	-	-	-	12.22	15.00 →
-	-	→	-	16.11.2014	-	-	-	12.30	15.00 →
-	-	→	-	14.12.2014	-	-	-	12.87	15.00 →
-	-	→	-	18.01.2015	-	-	-	12.61	15.00 →
-	-	→	-	10.02.2015	-	-	-	13.50	15.00 →
-	-	→	-	23.03.2015	-	-	-	14.49	15.00 →
-	Buy	→	26.03.2015	-	17.05.2015	2%	-4%	14.90	15.70 ↑
-	-	→	-	19.04.2015	-	-	-	15.20	15.70 →
-	-	→	-	13.05.2015	-	-	-	15.15	14.85 ↓
Sobiestaw Pająk	Hold	↓	17.05.2015	-	18.05.2015	-10%	-3%	14.30	14.85 →
Sobiestaw Pająk	-	→	-	21.06.2015	22.06.2015	-	-	13.95	14.85 →
Sobiestaw Pająk	Buy	↑	01.07.2015	-	02.07.2015	26%	26%	12.94	15.80 ↑
Sobiestaw Pająk	-	→	-	16.07.2015	17.07.2015	-	-	13.70	15.80 →
Sobiestaw Pająk	Hold	↓	04.08.2015	-	05.08.2015	-13%	-6%	16.35	15.80 →
Sobiestaw Pająk	-	→	-	31.08.2015	01.09.2015	-	-	13.32	15.80 →
Sobiestaw Pająk	Buy	↑	04.10.2015	-	05.10.2015	75%	80%	14.30	16.50 ↑
Sobiestaw Pająk	-	→	-	15.10.2015	16.10.2015	-	-	15.00	16.50 →
Sobiestaw Pająk	-	→	-	16.11.2015	17.11.2015	-	-	15.93	16.50 →
Sobiestaw Pająk	-	→	-	13.12.2015	14.12.2015	-	-	15.70	18.80 ↑
Sobiestaw Pająk	-	→	-	17.01.2016	18.01.2016	-	-	15.45	18.80 →
Sobiestaw Pająk	-	→	-	15.02.2016	16.02.2016	-	-	13.50	18.80 →
Sobiestaw Pająk	-	→	-	02.03.2016	03.03.2016	-	-	14.84	18.80 →
Sobiestaw Pająk	-	→	-	21.03.2016	22.03.2016	-	-	18.30	18.80 →
Sobiestaw Pająk	-	→	-	23.03.2016	24.03.2016	-	-	18.40	23.00 ↑
Sobiestaw Pająk	-	→	-	13.04.2016	14.04.2016	-	-	18.99	23.00 →
Sobiestaw Pająk	-	→	-	11.05.2016	11.05.2016	-	-	19.50	22.00 ↓
Sobiestaw Pająk	-	→	-	16.05.2016	17.05.2016	-	-	18.88	22.00 →
Sobiestaw Pająk	-	→	-	27.06.2016	28.06.2016	-	-	18.00	22.00 →
Sobiestaw Pająk	-	→	-	24.07.2016	25.07.2016	-	-	19.71	22.00 →
Sobiestaw Pająk	-	→	-	04.08.2016	04.08.2016	-	-	22.44	26.00 ↑
Sobiestaw Pająk	Buy	→	31.08.2016	-	01.09.2016	16%	-6%	23.99	26.00 →
Sobiestaw Pająk	-	→	-	12.10.2016	13.10.2016	-	-	23.01	26.00 →
Sobiestaw Pająk	-	→	-	02.11.2016	03.11.2016	-	-	23.10	26.00 →
Sobiestaw Pająk	-	→	-	04.12.2016	05.12.2016	-	-	23.00	26.20 ↑
Sobiestaw Pająk	-	→	-	12.01.2017	13.01.2017	-	-	24.01	26.20 →
Sobiestaw Pająk	-	→	-	08.02.2017	09.02.2017	-	-	23.01	26.20 →
Sobiestaw Pająk	-	→	-	07.03.2017	08.03.2017	-	-	26.20	26.20 →
Sobiestaw Pająk	Hold	↓	15.03.2017	-	16.03.2017	-3%	-9%	27.76	29.40 ↑
Sobiestaw Pająk	-	→	-	11.04.2017	12.04.2017	-	-	26.73	29.40 →
Sobiestaw Pająk	-	→	-	10.05.2017	11.05.2017	-	-	31.38	28.10 ↓
Sobiestaw Pająk	-	→	-	30.05.2017	31.05.2017	-	-	30.50	28.10 →
Sobiestaw Pająk	-	→	-	11.06.2017	12.06.2017	-	-	28.98	29.70 ↑
Sobiestaw Pająk	-	→	-	12.07.2017	13.07.2017	-	-	28.50	29.70 →
Sobiestaw Pająk	-	→	-	03.09.2017	04.09.2017	-	-	27.50	29.70 →
Sobiestaw Pająk	-	→	-	15.10.2017	16.10.2017	-	-	27.30	29.70 →
Sobiestaw Pająk	-	→	-	15.11.2017	16.11.2017	-	-	25.85	29.70 →
Sobiestaw Pająk	-	→	-	10.12.2017	11.12.2017	-	-	26.20	28.20 ↓
Sobiestaw Pająk	-	→	-	10.01.2018	11.01.2018	-	-	27.60	28.20 →
Sobiestaw Pająk	-	→	-	14.01.2018	15.01.2018	-	-	28.30	30.20 ↑
Sobiestaw Pająk	Buy	↑	13.02.2018	-	14.02.2018	11%	15%	25.60	30.20 →
Sobiestaw Pająk	-	→	-	12.03.2018	13.03.2018	-	-	28.90	30.20 →
Sobiestaw Pająk	Hold	↓	15.03.2018	-	16.03.2018	-14%	-10%	28.50	30.20 →
Sobiestaw Pająk	-	→	-	16.04.2018	17.04.2018	-	-	28.30	30.20 →
Sobiestaw Pająk	-	→	-	13.05.2018	14.05.2018	-	-	26.30	28.90 ↓
Sobiestaw Pająk	Buy	↑	29.05.2018	-	30.05.2018	11%	6%	23.10	28.90 →

LT fundamental recommendation tracker (continued)

Analyst	Recommendation	Report date	Reiteration date	Distribution date	Expiry date	Performance	Relative performance	Price at issue/ reiteration*	EFV (12 months)	
Sobiestaw Pająk	-	→	-	16.07.2018	17.07.2018	-	-	26.90	28.90 →	
Sobiestaw Pająk	-	→	-	02.08.2018	03.08.2018	-	-	26.00	28.90 →	
Sobiestaw Pająk	Hold	↓	30.08.2018	-	31.08.2018	09.12.2018	-5%	-1%	25.60	28.90 →
Sobiestaw Pająk	-	→	-	11.10.2018	12.10.2018	-	-	24.10	28.90 →	
Sobiestaw Pająk	-	→	-	23.10.2018	24.10.2018	-	-	24.40	28.90 →	
Sobiestaw Pająk	-	→	-	14.11.2018	15.11.2018	-	-	24.50	28.90 →	
Sobiestaw Pająk	Buy	↑	09.12.2018	-	10.12.2018	07.01.2019	22%	20%	24.20	29.50 ↑
Sobiestaw Pająk	Hold	↓	07.01.2019	-	08.01.2019	08.12.2019	2%	7%	28.00	29.90 ↑
Sobiestaw Pająk	-	→	-	10.01.2019	11.01.2019	-	-	27.90	29.90 →	
Sobiestaw Pająk	-	→	-	04.02.2019	05.02.2019	-	-	29.50	29.90 →	
Sobiestaw Pająk	-	→	-	26.02.2019	27.02.2019	-	-	29.50	29.90 →	
Sobiestaw Pająk	-	→	-	13.03.2019	14.03.2019	-	-	29.50	30.30 ↑	
Sobiestaw Pająk	-	→	-	26.03.2019	27.03.2019	-	-	29.80	30.30 →	
Sobiestaw Pająk	-	→	-	22.04.2019	23.04.2019	-	-	29.20	30.30 →	
Sobiestaw Pająk	-	→	-	24.04.2019	25.04.2019	-	-	28.60	30.30 →	
Sobiestaw Pająk	-	→	-	29.05.2019	30.05.2019	-	-	27.30	28.80 ↓	
Sobiestaw Pająk	-	→	-	30.05.2019	31.05.2019	-	-	28.00	28.80 →	
Sobiestaw Pająk	-	→	-	17.07.2019	18.07.2019	-	-	27.60	28.80 →	
Sobiestaw Pająk	-	→	-	30.07.2019	31.07.2019	-	-	27.40	28.80 →	
Sobiestaw Pająk	-	→	-	01.09.2019	02.09.2019	-	-	27.60	28.80 →	
Sobiestaw Pająk	-	→	-	13.10.2019	14.10.2019	-	-	28.00	28.80 →	
Sobiestaw Pająk	-	→	-	24.10.2019	25.10.2019	-	-	27.00	28.80 →	
Sobiestaw Pająk	-	→	-	17.11.2019	18.11.2019	-	-	28.00	28.80 →	
Sobiestaw Pająk	Hold	→	08.12.2019	-	09.12.2019	Not later than 08.12.2020	29%	43%	27.00	31.50 ↑
Sobiestaw Pająk	-	→	-	09.01.2020	10.01.2020	-	-	28.40	31.50 →	
Sobiestaw Pająk	-	→	-	14.01.2020	15.01.2020	-	-	28.80	31.50 →	
Sobiestaw Pająk	-	→	-	04.02.2020	05.02.2020	-	-	33.60	31.50 →	
Sobiestaw Pająk	-	→	-	06.02.2020	07.02.2020	-	-	33.60	31.50 →	
Sobiestaw Pająk	-	→	-	03.03.2020	04.03.2020	-	-	35.60	31.50 →	
Sobiestaw Pająk	-	→	-	30.03.2020	31.03.2020	-	-	31.00	31.50 →	
Sobiestaw Pająk	-	→	-	22.04.2020	23.04.2020	-	-	35.80	31.50 →	
Sobiestaw Pająk	-	→	-	17.05.2020	18.05.2020	-	-	34.00	29.70 ↓	
Sobiestaw Pająk	-	→	-	19.05.2020	20.05.2020	-	-	34.60	29.70 →	
Sobiestaw Pająk	-	→	-	15.06.2020	16.06.2020	-	-	31.80	29.70 →	
Sobiestaw Pająk	-	→	-	24.06.2020	25.06.2020	-	-	33.00	35.20 ↑	

\* prices at issue/reiteration are the closing prices at the report or reiteration date  
pre-June 2014 recommendations issued at DM IDMSA

Market-relative recommendation tracker

Analyst	Relative Recommendation		Report date	Reiteration date	Distribution date	Expiry date	Price at issue/ reiteration*	Relative performance
Asseco BS								
-	Overweight	→	07.02.2008	-	-	21.02.2008	12.50	4%
-	Neutral	↓	21.02.2008	-	-	11.05.2008	13.50	-3%
-	-	→	-	13.03.2008	-	-	13.30	-
-	-	→	-	30.03.2008	-	-	12.67	-
-	-	→	-	08.04.2008	-	-	12.66	-
-	Overweight	↑	11.05.2008	-	-	07.08.2008	12.50	5%
-	-	→	-	01.06.2008	-	-	12.97	-
-	-	→	-	29.06.2008	-	-	11.45	-
-	-	→	-	02.07.2008	-	-	11.30	-
-	-	→	-	28.07.2008	-	-	10.40	-
-	Neutral	↓	07.08.2008	-	-	09.11.2008	11.30	12%
-	-	→	-	31.08.2008	-	-	12.45	-
-	-	→	-	28.09.2008	-	-	10.80	-
-	-	→	-	01.10.2008	-	-	10.00	-
-	-	→	-	29.10.2008	-	-	8.55	-
-	Underweight	↓	09.11.2008	-	-	07.01.2009	8.80	-41%
-	-	→	-	30.11.2008	-	-	8.59	-
-	-	→	-	15.12.2008	-	-	6.20	-
-	Overweight	↑	07.01.2009	-	-	24.02.2009	5.20	86%
-	-	→	-	11.01.2009	-	-	5.34	-
-	-	→	-	08.02.2009	-	-	6.39	-
-	Neutral	↓	24.02.2009	-	-	17.05.2009	7.29	-29%
-	-	→	-	08.03.2009	-	-	6.00	-
-	-	→	-	05.04.2009	-	-	5.95	-
-	-	→	-	14.04.2009	-	-	5.62	-
-	Overweight	↑	17.05.2009	-	-	08.06.2009	6.80	0%
-	Neutral	↓	08.06.2009	-	-	08.07.2009	6.70	-4%
-	Underweight	↓	08.07.2009	-	-	24.08.2009	6.20	-12%
-	-	→	-	14.07.2009	-	-	6.14	-
-	-	→	-	02.08.2009	-	-	6.57	-
-	Neutral	↑	24.08.2009	-	-	08.12.2009	7.11	8%
-	-	→	-	31.08.2009	-	-	7.55	-
-	-	→	-	06.10.2009	-	-	8.53	-
-	-	→	-	12.10.2009	-	-	8.12	-
-	-	→	-	05.11.2009	-	-	7.64	-
-	Overweight	↑	08.12.2009	-	-	15.11.2010	7.90	28%
-	-	→	-	14.12.2009	-	-	8.00	-
-	-	→	-	07.01.2010	-	-	9.05	-
-	-	→	-	03.02.2010	-	-	8.79	-
-	-	→	-	01.03.2010	-	-	9.25	-
-	-	→	-	29.03.2010	-	-	9.99	-
-	-	→	-	31.03.2010	-	-	9.82	-
-	-	→	-	05.05.2010	-	-	10.00	-
-	-	→	-	17.05.2010	-	-	8.50	-
-	-	→	-	14.06.2010	-	-	9.03	-
-	-	→	-	30.06.2010	-	-	9.00	-
-	-	→	-	19.07.2010	-	-	9.20	-
-	-	→	-	31.08.2010	-	-	10.00	-
-	-	→	-	03.10.2010	-	-	10.70	-
-	-	→	-	12.10.2010	-	-	11.08	-
-	Overweight	→	15.11.2010	-	-	02.01.2011	11.20	15%
-	-	→	-	13.12.2010	-	-	10.74	-
-	-	→	-	15.12.2010	-	-	11.20	-
-	Neutral	↓	02.01.2011	-	-	10.03.2011	12.93	-5%
-	-	→	-	28.01.2011	-	-	12.16	-
-	-	→	-	01.03.2011	-	-	12.25	-
-	Overweight	↑	10.03.2011	-	-	11.05.2011	12.10	17%
-	-	→	-	13.03.2011	-	-	12.56	-
-	-	→	-	24.03.2011	-	-	12.44	-
-	-	→	-	20.04.2011	-	-	13.20	-
-	Neutral	↓	11.05.2011	-	-	31.08.2011	13.50	-15%
-	-	→	-	16.05.2011	-	-	12.30	-
-	-	→	-	20.06.2011	-	-	12.08	-
-	-	→	-	25.07.2011	-	-	10.92	-
-	Overweight	↑	31.08.2011	-	-	02.11.2011	9.90	4%
-	-	→	-	03.10.2011	-	-	10.00	-
-	-	→	-	24.10.2011	-	-	10.02	-
-	Neutral	↓	02.11.2011	-	-	25.01.2012	9.91	-1%
-	-	→	-	14.11.2011	-	-	10.43	-
-	-	→	-	11.12.2011	-	-	9.61	-
-	-	→	-	01.01.2012	-	-	9.29	-
-	Overweight	↑	25.01.2012	-	-	29.02.2012	9.52	5%
-	Neutral	↓	29.02.2012	-	-	09.03.2012	10.50	-2%
-	Underweight	↓	09.03.2012	-	-	21.06.2012	10.22	1%
-	-	→	-	20.03.2012	-	-	10.75	-
-	-	→	-	15.04.2012	-	-	10.55	-
-	-	→	-	09.05.2012	-	-	9.60	-
-	-	→	-	15.05.2012	-	-	9.61	-
-	Neutral	↑	21.06.2012	-	-	02.09.2012	9.13	-3%
-	-	→	-	19.07.2012	-	-	8.74	-
-	Underweight	↓	02.09.2012	-	-	05.11.2012	9.20	-3%
-	-	→	-	01.10.2012	-	-	8.90	-
-	-	→	-	10.10.2012	-	-	8.37	-

## Market-relative recommendation tracker (continued)

Analyst	Relative Recommendation		Report date	Reiteration date	Distribution date	Expiry date	Price at issue/ reiteration*	Relative performance
-	Overweight	↑	05.11.2012	-	-	06.11.2012	9.35	5%
-	Neutral	↓	06.11.2012	-	-	20.10.2013	9.80	12%
-	-	→	-	14.11.2012	-	-	9.50	-
-	-	→	-	13.12.2012	-	-	10.65	-
-	-	→	-	23.01.2013	-	-	10.31	-
-	-	→	-	18.02.2013	-	-	11.09	-
-	-	→	-	21.03.2013	-	-	11.19	-
-	-	→	-	02.04.2013	-	-	11.55	-
-	-	→	-	17.04.2013	-	-	11.08	-
-	-	→	-	13.05.2013	-	-	10.70	-
-	-	→	-	15.05.2013	-	-	11.39	-
-	-	→	-	17.06.2013	-	-	11.69	-
-	-	→	-	14.07.2013	-	-	10.80	-
-	-	→	-	25.07.2013	-	-	11.18	-
-	-	→	-	01.09.2013	-	-	11.98	-
-	Neutral	→	20.10.2013	-	-	08.04.2014	12.50	1%
-	-	→	-	14.11.2013	-	-	13.20	-
-	-	→	-	12.12.2013	-	-	12.85	-
-	-	→	-	14.01.2014	-	-	13.17	-
-	-	→	-	21.01.2014	-	-	13.29	-
-	-	→	-	17.02.2014	-	-	12.10	-
-	-	→	-	23.03.2014	-	-	12.47	-
-	Overweight	↑	08.04.2014	-	-	07.10.2014	12.65	-1%
-	-	→	-	13.04.2014	-	-	12.60	-
-	-	→	-	11.05.2014	-	-	12.86	-
-	-	→	-	15.05.2014	-	-	12.00	-
-	-	→	-	16.06.2014	-	-	11.59	-
-	-	→	-	20.07.2014	-	-	11.16	-
-	-	→	-	01.09.2014	-	-	11.49	-
-	Neutral	↓	07.10.2014	-	-	01.07.2015	12.00	17%
-	-	→	-	14.10.2014	-	-	12.22	-
-	-	→	-	16.11.2014	-	-	12.30	-
-	-	→	-	14.12.2014	-	-	12.87	-
-	-	→	-	18.01.2015	-	-	12.61	-
-	-	→	-	10.02.2015	-	-	13.50	-
-	-	→	-	23.03.2015	-	-	14.49	-
-	-	→	-	26.03.2015	-	-	14.90	-
-	-	→	-	19.04.2015	-	-	15.20	-
-	-	→	-	13.05.2015	-	-	15.15	-
Sobiestaw Pająk	-	→	-	17.05.2015	18.05.2015	-	14.30	-
Sobiestaw Pająk	-	→	-	21.06.2015	22.06.2015	-	13.95	-
Sobiestaw Pająk	Overweight	↑	01.07.2015	-	02.07.2015	04.08.2015	12.94	26%
Sobiestaw Pająk	-	→	-	16.07.2015	17.07.2015	-	13.70	-
Sobiestaw Pająk	Neutral	↓	04.08.2015	-	05.08.2015	04.10.2015	16.35	-6%
Sobiestaw Pająk	-	→	-	31.08.2015	01.09.2015	-	13.32	-
Sobiestaw Pająk	Overweight	↑	04.10.2015	-	05.10.2015	13.12.2015	14.30	22%
Sobiestaw Pająk	-	→	-	15.10.2015	16.10.2015	-	15.00	-
Sobiestaw Pająk	-	→	-	16.11.2015	17.11.2015	-	15.93	-
Sobiestaw Pająk	Neutral	↓	13.12.2015	-	14.12.2015	02.03.2016	15.70	-8%
Sobiestaw Pająk	-	→	-	17.01.2016	18.01.2016	-	15.45	-
Sobiestaw Pająk	-	→	-	15.02.2016	16.02.2016	-	13.50	-
Sobiestaw Pająk	Overweight	↑	02.03.2016	-	03.03.2016	08.02.2017	14.84	32%
Sobiestaw Pająk	-	→	-	21.03.2016	22.03.2016	-	18.30	-
Sobiestaw Pająk	-	→	-	23.03.2016	24.03.2016	-	18.40	-
Sobiestaw Pająk	-	→	-	13.04.2016	14.04.2016	-	18.99	-
Sobiestaw Pająk	-	→	-	11.05.2016	11.05.2016	-	19.50	-
Sobiestaw Pająk	-	→	-	16.05.2016	17.05.2016	-	18.88	-
Sobiestaw Pająk	-	→	-	27.06.2016	28.06.2016	-	18.00	-
Sobiestaw Pająk	-	→	-	24.07.2016	25.07.2016	-	19.71	-
Sobiestaw Pająk	-	→	-	04.08.2016	04.08.2016	-	22.44	-
Sobiestaw Pająk	-	→	-	31.08.2016	01.09.2016	-	23.99	-
Sobiestaw Pająk	-	→	-	12.10.2016	13.10.2016	-	23.01	-
Sobiestaw Pająk	-	→	-	02.11.2016	03.11.2016	-	23.10	-
Sobiestaw Pająk	-	→	-	04.12.2016	05.12.2016	-	23.00	-
Sobiestaw Pająk	-	→	-	12.01.2017	13.01.2017	-	24.01	-
Sobiestaw Pająk	Overweight	→	08.02.2017	-	09.02.2017	30.05.2017	23.01	27%
Sobiestaw Pająk	-	→	-	07.03.2017	08.03.2017	-	26.20	-
Sobiestaw Pająk	-	→	-	15.03.2017	16.03.2017	-	27.76	-
Sobiestaw Pająk	-	→	-	11.04.2017	12.04.2017	-	26.73	-
Sobiestaw Pająk	-	→	-	10.05.2017	11.05.2017	-	31.38	-
Sobiestaw Pająk	Neutral	↓	30.05.2017	-	31.05.2017	15.11.2017	30.50	-18%
Sobiestaw Pająk	-	→	-	11.06.2017	12.06.2017	-	28.98	-
Sobiestaw Pająk	-	→	-	12.07.2017	13.07.2017	-	28.50	-
Sobiestaw Pająk	-	→	-	03.09.2017	04.09.2017	-	27.50	-
Sobiestaw Pająk	-	→	-	15.10.2017	16.10.2017	-	27.30	-
Sobiestaw Pająk	Overweight	↑	15.11.2017	-	16.11.2017	30.08.2018	25.85	7%
Sobiestaw Pająk	-	→	-	10.12.2017	11.12.2017	-	26.20	-
Sobiestaw Pająk	-	→	-	10.01.2018	11.01.2018	-	27.60	-
Sobiestaw Pająk	-	→	-	14.01.2018	15.01.2018	-	28.30	-
Sobiestaw Pająk	-	→	-	13.02.2018	14.02.2018	-	25.60	-
Sobiestaw Pająk	-	→	-	12.03.2018	13.03.2018	-	28.90	-
Sobiestaw Pająk	-	→	-	15.03.2018	16.03.2018	-	28.50	-
Sobiestaw Pająk	-	→	-	16.04.2018	17.04.2018	-	28.30	-

**Market-relative recommendation tracker (continued)**

Market-Relative Recommendation Tracker (continued)								
Analyst	Relative Recommendation	Report date	Reiteration date	Distribution date	Expiry date	Price at issue/ reiteration*	Relative performance	
Sobiestaw Pająk	-	→	-	13.05.2018	14.05.2018	-	26.30	-
Sobiestaw Pająk	-	→	-	29.05.2018	30.05.2018	-	23.10	-
Sobiestaw Pająk	-	→	-	16.07.2018	17.07.2018	-	26.90	-
Sobiestaw Pająk	-	→	-	02.08.2018	03.08.2018	-	26.00	-
Sobiestaw Pająk	Neutral	↓	30.08.2018	-	31.08.2018	30.07.2019	25.60	15%
Sobiestaw Pająk	-	→	-	11.10.2018	12.10.2018	-	24.10	-
Sobiestaw Pająk	-	→	-	23.10.2018	24.10.2018	-	24.40	-
Sobiestaw Pająk	-	→	-	14.11.2018	15.11.2018	-	24.50	-
Sobiestaw Pająk	-	→	-	09.12.2018	10.12.2018	-	24.20	-
Sobiestaw Pająk	-	→	-	07.01.2019	08.01.2019	-	28.00	-
Sobiestaw Pająk	-	→	-	10.01.2019	11.01.2019	-	27.90	-
Sobiestaw Pająk	-	→	-	04.02.2019	05.02.2019	-	29.50	-
Sobiestaw Pająk	-	→	-	26.02.2019	27.02.2019	-	29.50	-
Sobiestaw Pająk	-	→	-	13.03.2019	14.03.2019	-	29.50	-
Sobiestaw Pająk	-	→	-	26.03.2019	27.03.2019	-	29.80	-
Sobiestaw Pająk	-	→	-	22.04.2019	23.04.2019	-	29.20	-
Sobiestaw Pająk	-	→	-	24.04.2019	25.04.2019	-	28.60	-
Sobiestaw Pająk	-	→	-	29.05.2019	30.05.2019	-	27.30	-
Sobiestaw Pająk	-	→	-	30.05.2019	31.05.2019	-	28.00	-
Sobiestaw Pająk	-	→	-	17.07.2019	18.07.2019	-	27.60	-
Sobiestaw Pająk	Neutral	→	30.07.2019	-	31.07.2019	14.01.2020	27.40	6%
Sobiestaw Pająk	-	→	-	01.09.2019	02.09.2019	-	27.60	-
Sobiestaw Pająk	-	→	-	13.10.2019	14.10.2019	-	28.00	-
Sobiestaw Pająk	-	→	-	24.10.2019	25.10.2019	-	27.00	-
Sobiestaw Pająk	-	→	-	17.11.2019	18.11.2019	-	28.00	-
Sobiestaw Pająk	-	→	-	08.12.2019	09.12.2019	-	27.00	-
Sobiestaw Pająk	-	→	-	09.01.2020	10.01.2020	-	28.40	-
Sobiestaw Pająk	Overweight	↑	14.01.2020	-	15.01.2020	24.06.2020	28.80	42%
Sobiestaw Pająk	-	→	-	04.02.2020	05.02.2020	-	33.60	-
Sobiestaw Pająk	-	→	-	06.02.2020	07.02.2020	-	33.60	-
Sobiestaw Pająk	-	→	-	03.03.2020	04.03.2020	-	35.60	-
Sobiestaw Pająk	-	→	-	30.03.2020	31.03.2020	-	31.00	-
Sobiestaw Pająk	-	→	-	22.04.2020	23.04.2020	-	35.80	-
Sobiestaw Pająk	-	→	-	17.05.2020	18.05.2020	-	34.00	-
Sobiestaw Pająk	-	→	-	19.05.2020	20.05.2020	-	34.60	-
Sobiestaw Pająk	-	→	-	15.06.2020	16.06.2020	-	31.80	-
Sobiestaw Pająk	Neutral	↓	24.06.2020	-	25.06.2020	Not later than 24.06.2021	33.00	-

\* prices at issue/reiteration are the closing prices at the report or reiteration date  
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