What is Behind the Figures?
Conceptual Mistakes in the Equity Valuations
Prepared by Research Analysts in Poland

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Abstract: By their nature, corporate valuations are partially built on analysts' opinions, and not only on objective facts. However, it is of primary importance for equity research to be grounded on sound economic theory and existing methodological conventions. Otherwise, an inherent element of subjectivity may degrade into the complete arbitrariness of the assumptions underlying the valuation model. This paper covers conceptual mistakes which may appear in the calculation of the residual value in discounted cash flow valuation models prepared by sell-side equity analysts. In particular, we have analysed some of the essential postulates underlying the estimation of the perpetual growth rate. Our study covering 100 randomly selected investment recommendations prepared by equity research analysts in Poland, shows that these postulates are not adhered to in most cases. Flawed input data translate into the implied company's fundamentals devoid of economic sense. Unrealistic assumptions underlying valuation models question the credibility of investment recommendations and prompt the discussion over the factors shaping the investment decisions of the market participants.

Keywords: RONIC; perpetual growth rate; valuation; investment recommendation

Introduction

Fernandez and Bilan (2007) describe 110 conceptual errors commonly encountered in income-based equity valuation models. They include inconsistencies in cash flow forecasts, mistakes in the calculation of the discount rate, erroneous assumptions regarding a company's capital structure and implied continuous growth rate (e.g., unrealistic exit multiples) etc. This paper expands the list to include the commonly observed mistakes stemming from the lack of adherence to the existing methodological conventions for the discounted cash flow (DCF) models. In particular, we have highlighted the prevalent mishaps in the calculations of continuous growth rates and terminal values, resulting in those figures being in blatant dissonance with the fundamentals of the valued entities. Since in most cases residual value (RV) constitutes a major part of the total enterprise value, the soundness of assumptions underlying the estimation of RV is of primary importance. We have analysed

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the economic theory standing behind the said assumptions and have tried to track whether the essential theoretical postulates are adhered to by Polish equity research analysts.

For the purposes of this study we randomly selected a sample of 100 investment recommendations prepared by the equity research analysts of six major brokerage houses in Poland. We checked whether the estimates of the continuous growth rates for the recommended entities derived from in-depth company fundamentals and accorded with the existing theoretical conventions in the domain of corporate valuation.

1. Theoretical Assumptions Underlying the Calculation of Residual Value

The most commonly applied formula for residual value in DCF models is as follows:

$$RV = \frac{FCFF_{t+1}}{WACC - g} = \frac{FCFF_t \times (1 + g)}{WACC - g} \tag{1}$$

where:

RV – residual value,
$FCFF_t$ – free cash flow for a firm in period t, which is usually the end of the explicit forecast period,
$WACC$ – weighted average cost of capital,
g – perpetual growth rate.

Copeland et al. (2010) further deconstructs the formula into:

$$g = \text{Reinvestment Rate} \times RONIC \tag{2}$$

where $RONIC$ – return on new invested capital in the residual period, and

$$\text{Reinvestment Rate} = \frac{(CAPEX + WCI - DA)}{NOPAT} \tag{3}$$

or

$$\text{Reinvestment Rate} = \frac{g}{RONIC} \tag{4}$$

where:

$CAPEX$ – capital expenditures in the last year of the explicit forecast,
WCI – working capital investments in the last year of the detailed forecast,
DA – depreciation and amortization in the last year of the explicit forecast,
$NOPAT$ – net operating profit after taxes in the last year of a detailed forecast.

The free cash flow for a firm can be calculated as follows:

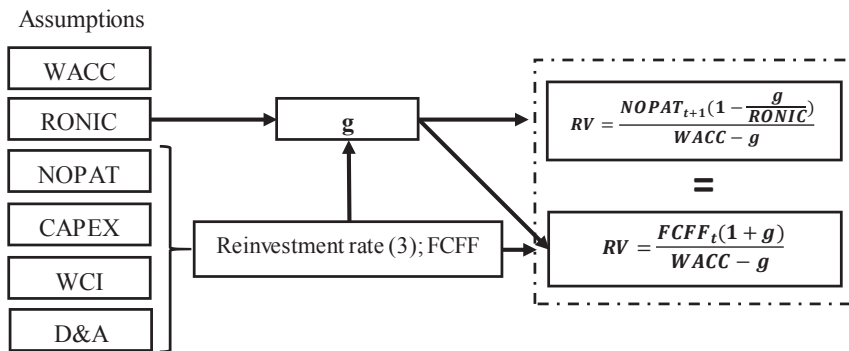$$FCFF = NOPAT \times (1 - \text{Reinvestment Rate}) \tag{5}$$

By plugging equations (2), (3), (4) and (5) into equation (1) we get:

$$RV = \frac{FCFF_t \times (1+g)}{WACC-g} = \frac{NOPAT \times \left(1-\dfrac{g}{RONIC}\right) \times \left(1+\dfrac{(CAPEX+WCI-DA) \times RONIC}{NOPAT}\right)}{WACC-g} = \tag{6}$$

$$= \frac{NOPAT_{t+1} \times \left(1-\dfrac{g}{RONIC}\right)}{WACC-g}$$

which Copeland et al. (1990) call the key value drivers formula. Formulae (1) and (6) yield identical results. The above formula proves that the value of the perpetual growth rate g should not be estimated independently from the projected company's data, but should rather rely on consistent assumptions regarding the dynamics of RONIC and the reinvestment rate.
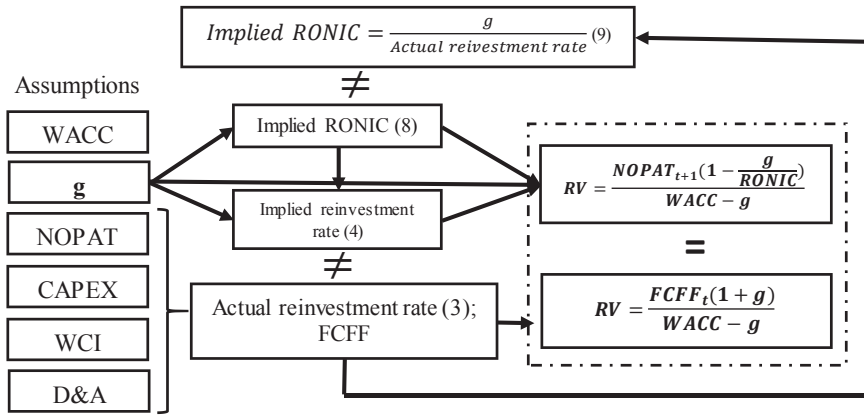
In order to be methodologically consistent in the calculation of g, one should start with the assumptions regarding RONIC and the reinvestment rate, which should afterwards serve as inputs for the calculation of g and residual value (Figure 1). However, if the analyst's starts from the perpetual growth rate, further assumptions may lose consistency as shown in Figure 2.

Figure 1. Consistency of the assumptions underlying the valuation model

Source: own study.

Most of the corporate finance and valuation textbooks (Damodaran, 2010; Fernandez, 2015; Ross et al., 2013) cover the problematic area of the estimation of perpetual growth rate. Damodaran (2010) notes that all the inputs for the calculation of the residual value should reasonably describe a company's steady state, which may be sustained indefinitely. The inputs to the calculation of the continuous growth rate may be estimated using both the historical firm-level data and the industry benchmarks.

Figure 2. Inconsistent results caused by an inappropriate order of assumptions

Source: own study.

As a company becomes mature, its reinvestment rate should gradually approach the industry averages, unless the company's fundamentals suggest a different pattern.

Return on invested capital (ROIC) in excess of the cost of capital allows the company to create positive economic value-added (EVA):

$$EVA = (ROIC - WACC) \times CI \qquad (7)$$

where CI – is the book value of the invested capital.

As a firm expands its operations and increases its market share, the competitive pressure causes a gradual erosion of RONIC. Hence, for the majority of companies, RONIC will gradually approach WACC at the end of the explicit forecast period (Damodaran, 2010; Copeland et al., 2010). If a company's RONIC is considerably higher than WACC in the residual period, a firm is then assumed to possess a well-established competitive advantage, which allows it to create positive value-added infinitely (Mielcarz, Roman, 2012).

For most companies, it is perfectly sound to assume that a higher perpetual growth rate translates into a higher residual value, and therefore, into a higher equity value (E). However, the key determinant, which shapes this relationship and which is often lost from sight, is the RONIC. Basically, there are three options potentially envisaged by the analyst to describe a firm's value creating potential in the residual period:

1. RONIC > WACC. In most cases, the two values will be quite close. Significant difference is possible if a company has an engrained long-lasting competitive advantage (e.g., if the network effect or considerable economies of scale apply). The company with a RONIC exceeding WACC is assumed to create a positive EVA through the entire residual period.

Under such circumstances, any additional amount of invested capital should increase the total value. However, as the company runs out of attractive investment projects, its reinvestment rate should gradually approach the long-term industry average, which should be sufficient to sustain the company's existing operations and cater for opportunities of organic growth (usually it corresponds to the growth of the market, which the company shares with its rivals). Therefore, this inequality should not hold for most companies, as the increasing competition exercises a downward pressure on the RONIC (Damodaran, 1994). The transmission mechanism is as follows:

$ROIC > WACC \Rightarrow (CAPEX \uparrow \text{ or } WCI \uparrow) \Rightarrow \text{Reinvestment Rate } \uparrow \Rightarrow g \uparrow \Rightarrow RV \uparrow \Rightarrow E \uparrow.$

2. *RONIC = WACC*. Additional amounts of invested capital create no value-added. Increased investment translates into an increased reinvestment rate, which, in turn, contributes to the increase of the perpetual growth rate. However, the total value does not change. Hence, investments and growth rate become value neutral. The relationship may be summarized as follows:

$RONIC = WACC \Rightarrow (CAPEX \uparrow \text{ or } WCI \uparrow) \Rightarrow \text{Reinvestment Rate } \uparrow \Rightarrow g \uparrow \Rightarrow RV = \text{const.}$

It appears to be the most widespread scenario as the majority of companies are not able to secure a long-term competitive advantage allowing them to generate RONIC in excess of WACC in perpetuity.

3. RONIC < WACC. This case appears to be the least likely. A company is assumed to create a negative economic value-added through the entire residual period. The shareholder value is assumed to be gradually wasted through unproductive investments. This situation is not sustainable: it contradicts the highest and best use assumption (HBU) endorsed by the International Valuation Standards and International Financial Reporting Standard 13 (Mielcarz, Wnuczak, 2011). The shareholders will try to remedy the situation by either replacing the company's management (if the source of inefficiency resides in managerial practices) or by withdrawing funds and discontinuing value-destroying operations. Hence, despite its positive contribution to the increase of the perpetual growth rate, any additional investments in such settings will result in more value destruction as more and more capital will be put to an unproductive use. The relationship may be summarized as follows:

$RONIC < WACC \Rightarrow (CAPEX \uparrow \text{ or } WCI \uparrow) \Rightarrow \text{Reinvestment Rate } \uparrow \Rightarrow g \uparrow \Rightarrow RV \downarrow \Rightarrow E \downarrow.$

To sum up, the calculation of the continuous growth rate should be preceded with a careful analysis of the company's competitive position, its ability to resist competitive pressure in the long-term perspective, and its sustainable reinvestment policy which may apply in the residual period.

2. Mistakes Discovered in Equity Valuation Models

In order to check whether the aforementioned theoretical postulates are adhered to in practice, we collected a sample of 100 investment recommendations prepared by the equity research analysts of 6 major brokerage houses (encoded by letters A–F) in Poland in 2015 (last quarter) and 2016. The recommendations are publicly available on the webpage www. bankier.pl. All of them feature DCF valuations based on FCFF methodology. Table 2 summarizes the primary data retrieved from the recommendations. By rearranging formula (2) and (6) we get the implied value of RONIC:

$$RONIC = \frac{NOPAT_{t+1} \times g}{NOPAT_{t+1} - RV(WACC - g)} \tag{8}$$

$$RONIC = \frac{g}{\text{Actual reinvestment rate}} \tag{9}$$

It should be emphasized, that formulae (8) and (9) do not yield the same result if the inputs are misaligned. Hence, changing the order of the assumptions may break the consistency of the valuation inputs. All further comments refer to RONIC calculated relying on formula (8).

We also retrieved the data for the companies' investment policy in the residual period: CAPEX, working capital investment and depreciation. Using formula (3) we calculated the actual reinvestment rates assumed by the analysts. By plugging the values of g and Implied RONIC into formula (4) we can calculate the implied reinvestment rate, which may not be equal to the actual reinvestment rate featuring in the recommendations if the equalities (2)–(5) do not hold.

In 99 recommendations the perpetual growth rate is non-negative (in one recommendation g = 0% and in another one g = –2%). In 64 recommendations RONIC > WACC, in 36 recommendations RONIC < WACC. Hence, in 36% of cases the analyst implicitly assumed that a company would not discontinue its operations despite destroying shareholder value. In the vast majority of the analysed recommendations, the implied RONICs are not justifiable being either considerably higher than the WACC and most probably currently applicable ROIC (which is unrealistic in the residual period) or significantly lower than the applicable hurdle rate.

All the presented conceptual mistakes are summarized in Table 1.

In 19 cases out of 100 the implied RONIC is below zero, which is devoid of economic sense and point to the fact that the perpetual growth rate was chosen without reference to the company's fundamentals.

In 32 recommendations the FCFF forecasts suggest that the companies will keep on investing in the residual period despite their RONIC being below WACC. In 6 recommendations the companies have negative net investments in the residual period; in 3 recommendations

out of these 6 the companies disinvest despite having their RONIC considerably higher than WACC. Negative reinvestment rate implies the gradual reduction of the company's fixed assets and winding up of the operations (Damodaran, 2010).

Table 1

Summary of the conceptual mistakes encountered in the analysed sample of recommendations

Conceptual errors embedded in the implied RONIC calculated using formula (8) or (9)				
Description of the mistake	Abnormally high RONIC (significantly higher than WACC) without any proper justification	RONIC < WACC and RONIC ≥ 0	RONIC < 0	RONIC > WACC when g < 0 and Actual reinvestment rate < 0	RONIC = 0% implied in g = 0% under the assumption of Actual reinvestment rate < 0
Implied assumption	The company has a strong, sustainable perpetual competitive advantage and significantly outperforms its peers	The company undertakes negative-NPV projects and creates negative EVA through the residual period	The company destroys shareholder value through the entire residual period and the owners knowingly accept it	The company has attractive investment projects but disinvests, causing the cash flows to shrink	RONIC = 0% < WACC, hence, the company is assumed to destroy shareholder value in the residual period. Mathematical implication of formula (2). Additionally, the company disinvests
Number of mistakes	48 (RONIC > 2 × WACC)	17	19	1	1
Conceptual errors embedded in the actual reinvestment rate (retrieved from recommendations)				
Description of the mistake	Reinvestment Rate ≠ 0 linked with g = 0%	Reinvestment rate < 0 linked with g ≥ 0%	Reinvestment rate > 0 linked with RONIC < WACC	Reinvestment rate < 0 linked with RONIC > WACC	Reinvestment rate = 0 linked with g > 0 and unjustifiable RONIC (excessively high or negative)
Implied assumption	The company perpetually executes negative-NPV projects as the implied RONIC = 0% < WACC	Despite perpetual disinvestment (which eventually exhausts the stock of operating assets) the company is able to increase generated cash flows	The company invests despite generating negative EVA from the incremental invested capital. Intentional destruction of shareholder value	The company disinvests despite having a stock of attractive investment projects generating a high rate of return	Zero reinvestment rate implies g = 0% (formula 2). The company either 1) does not invest despite having attractive opportunities (high RONIC); or 2) maintains operations despite destroying value (negative RONIC)
Number of mistakes	1	4	32	3	4

Source: own elaboration.

In 31 recommendations CAPEX is assumed to be equal to depreciation in the residual period. The positive reinvestment rate is secured by ever increasing working capital investments.

In four recommendations the actual reinvestment rate is zero. In one of them the implied RONIC is considerably below zero and makes no sound economic sense, in the other three the implied RONIC is unjustifiably higher than WACC.

We deliberately included several recommendations prepared for the same entities for the same period prepared by different brokerage houses. Take the example of recommendations No. 3 (Table 2) and No. 27 prepared for LPP SA by the institutions G and F respectively: 1) for No. 3 the implied RONIC (formula 8) is negative but the company is assumed to keep investing in the residual period; 2) in No. 27 the implied RONIC is below WACC, but the authors of the recommendations assume (through the reinvestment rate) that the company invests heavily in value-destroying operations in the residual period. The recommendations do not even closely accord with any of the implied company's fundamentals.

Table 2

Summary of the research

No	Issuer	Recommended Entity	Recommendation	g (%)	NO-PAT× (1 + g)	RV	WACC (%)	Implied RONIC (8) (%)	Actual Re-investment Rate (3) (%)	Implied RONIC (9) (%)
1	2	3	4	5	6	7	8	9	10	11
1	A	CCC SA	Hold	1.50	735.9	10,603	7.40	10.0	14.5	10.4
2	G	CCC SA	Hold	3.00	577.1	9,783	7.90	17.7	15.2	19.7
3	G	LPP SA	Sell	2,00	686.7	13,200	8,00	−13.0	16.8	11.9
4	C	KGHM	Buy	1.50	2,773.0	31,815	9.00	10.8	42.8	3.5
5	B	ATM Grupa	Buy	2.00	18.2	255	8.70	33.1	25.3	7.9
6	B	Śnieżka	Buy	2.00	68.6	940	9.00	48.0	8.2	24.5
7	B	Groclin	Buy	2.00	30.5	378	8.80	12.7	17.7	11.3
8	B	Vistula	Buy	2.00	68.6	985	8.70	51.5	4.2	48.1
9	B	Orbis	Buy	2.50	275.2	4,438	8.50	77.0	6.7	37.3
10	C	Pekabex	Hold	1.00	29.3	372	8.50	20.5	5.2	19.3
11	C	Apator	Hold	0.50	78.6	1,119	7.40	28.9	2.0	24.4
12	B	PKN Orlen	Buy	1.00	3.9	43	10.00	84.9	1.8	55.6
13	B	PCC Rokita	Hold	0.00	147.6	1,856	7.70	0.0	−0.3	0.0
14	B	MFO	Buy	1.00	21.1	212	9.30	6.0	24.4	4.1
15	D	Alumetal	Hold	2.00	814	1,196	8.50	44.3	4.5	44.3
16	C	PKP Cargo	Sell	1.50	266.0	4,101	6.70	7.6	20.3	7.4
17	B	LOTOS	Buy	1.00	1,034.5	12,050	9.50	100.8	0.3	349.7
18	C	ROBYG	Buy	1.00	64.1	1,018	7.50	−32.0	1.4	70.6
19	B	Dom Development	Hold	1.00	90.3	1,436	7.50	−29.6	14.4	6.9
20	C	Budimex	Hold	2.00	222.7	3,823	8.30	−24.5	6.9	29.1
21	C	JSW	Buy	1.50	815.1	6,771	10.00	5.1	60.3	2.5
22	E	Mercator Medical	Buy	1.00	35.0	404	9.80	−63.4	0.0	n/a
23	C	WPH	Buy	3.00	159.5	2,310	9,60	67.3	1.0	309.8
24	B	Mostostal Zabrze	Buy	1.00	13.6	160	9.00	16.5	7.4	13.5
25	B	COGNOR	Buy	1.00	81.6	737	12.40	−34.0	10.4	9.6
26	F	CCC SA	Hold	3.00	849.8	12,488	7.30	8.2	27.5	10.9
27	F	LPP SA	Hold	2.50	1,081.4	13,318	7.60	6.7	24.0	10.4

1	2	3	4	5	6	7	8	9	10	11
28	F	Vistula Group	Buy	2.00	70.9	1,004	7.30	8.0	15.8	12.6
29	B	FORTE	Sell	2.00	210.7	2,619	9.00	15.4	11.2	17.8
30	E	Archicom	Buy	1.00	64.4	700	8.70	6.1	11.0	9.1
31	B	Cyfrowy Polsat	Buy	1.00	2,217.0	28,886	8.30	20.5	5.3	18.9
32	B	GPW	Buy	1.50	125.9	1,739	8.60	79.0	6.5	23.3
33	C	Bogdanka	Hold	1.00	194.6	2,610	8.20	29.0	−11.4	−8.8
34	C	JSW	Buy	1.00	723.7	4,762	10.50	2.7	39.9	2.5
35	C	Kęty	Buy	2.00	310.4	4,538	8.30	25.3	5.1	39.5
36	C	AB	Hold	1.00	81.5	1,046	8.60	40.6	9.4	10.6
37	B	COGNOR	Buy	1.00	81.2	753	12.10	−34.9	10.2	9.8
38	C	Eurocash	Buy	2.00	485.0	8,341	7.90	−136.1	7.1	28.1
39	C	Ciech	Hold	1.00	309.0	5,176	6.80	35.4	16.1	6.2
40	C	KGHM	Buy	1.50	2,289.1	31,476	8.20	19.1	66.2	2.3
41	C	AmRest	Buy	3.00	395.1	8,859	6.90	23.9	33.9	8.8
42	E	The Farm 51	Buy	2.00	6.1	90	8.80	1285.7	0.0	n/a
43	B	COMP	Buy	2.00	52.3	711	9.00	40.9	4.9	41.0
44	B	CO-MARCH	Buy	2.00	132.9	1,761	9.00	27.6	19.6	10.2
45	F	ZM Henryk Kania	Buy	1.50	84.8	868	8.50	5.3	27.5	5.4
46	C	Pfleiderer Grajewo	Hold	1.00	55.3	852	7.30	33.1	2.7	36.5
47	C	PGNIG	Buy	1.00	2,483.6	38,347	7.80	−20.0	28.2	3.5
48	C	Grupa Azoty	Hold	1.00	889.0	12,456	8.00	52.1	7.1	14.1
49	B	PKP Cargo	Buy	1.00	295.7	3,689	9.00	499.5	1.2	81.3
50	C	Synthos	Buy	1.00	562.9	8,010	8.10	−96.4	16.8	6.0
51	B	Arctic Paper	Buy	-2.00	31.2	295	9.00	47.7	−4.1	48.9
52	C	Tauron	Hold	1.00	1,952.3	24,003	6.90	3.6	28.0	3.6
53	B	CIECH	Buy	1.00	446.4	5,535	9.00	122.8	0.8	119.5
54	C	Otmuchów	Hold	1.00	6.9	98	7.80	34.6	27.9	3.6
55	B	Kęty	Buy	2.00	348.1	4,495	9.00	20.8	10.0	20.0
56	E	VIGO System	Buy	1.00	19.7	223	9.30	16.8	5.6	17.7
57	C	Enea	Hold	1.00	1,478.9	15,385	6.90	2.6	38.7	2.6
58	E	Archicom	Buy	1.00	54.9	612	8.50	6.1	9.2	10.9
59	C	CEZ	Buy	100	20,078	497,283	5.00	107.1	1.0	103.0
60	C	Energa	Hold	1,00	1,129.6	13,709	6.80	3.4	29.4	3.4
61	C	PGE	Buy	1.00	3,674.9	56,682	7.50	−388.7	−0.5	−214.0
62	B	Stalprofil	Buy	2.00	37.4	500	8.80	21.8	9.0	22.2
63	B	Dom Development	Hold	1.00	123.2	1,550	8.09	9.3	10.6	9.5
64	B	Robyg	Buy	1.00	95.1	1,198	8.20	10.7	6.8	14.7
65	B	Budimex	Sell	1.00	236.1	2,951	9.00	6945.2	1.6	63.2
66	B	Wasko	Buy	1.00	17.5	214	9.00	53.1	7.5	13.3

1	2	3	4	5	6	7	8	9	10	11
67	E	Soho Deve-lopment	Buy	1.00	16.5	166	9.00	5.2	276.1	0.4
68	C	ZPUE	Hold	0.50	53.3	752	7.40	19.0	3.0	16.6
69	B	Bytom	Sell	1.00	24.6	303	9.00	57.6	1.6	61.0
70	E	JHM Deve-lopment	Buy	0.50	16.8	155	9.50	3.0	57.5	0.9
71	E	Impel	Buy	2.20	52.6	715	9.40	103.3	0.0	n/a
72	C	Action	Sell	1.00	43.8	607	7.50	10.0	9.4	10.6
73	B	Stalprodukt	Buy	2.00	152.3	2,087	8.80	29.4	9.4	21.3
74	B	Forte	Buy	2.00	190.7	2,429	9.00	18.4	8.7	23.1
75	B	ATM Grupa	Hold	2.00	18.8	299	8.90	−20.4	24.5	8.2
76	B	Selena FM	Buy	1.00	56.9	597	10.00	18.1	6.0	16.6
77	C	Action	Buy	1.00	66.1	805	8.50	11.6	7.0	14.2
78	C	AB	Buy	1.00	84.9	1132	8.30	36.4	9.6	10.4
79	C	Eurocash	Buy	2.00	579.2	9,806	8.10	−60.9	6.2	32.4
80	C	Emperia	Buy	2.00	87.8	1,001	8.20	6.8	41.8	4.8
81	E	VIGO System	Buy	2.00	15.4	190	9.50	27.0	5.3	37.8
82	E	OT Logi-stics	Buy	1.00	39.4	451	9.70	222.1	0.0	n/a
83	B	Qumak	Sell	1.00	11.8	120	8.70	4.6	24.8	4.0
84	B	Bytom	Sell	1.00	22.3	275	9.00	61.8	1.8	55.3
85	C	Pekabex	Hold	1.00	29.6	357	9.00	28.4	2.7	36.6
86	C	Synthos	Buy	1.00	590.9	8,575	8.00	−62.7	22.9	4.4
87	C	AmRest	Buy	3.00	342.2	62,79	6.60	8.8	53.9	5.6
88	C	Grupa Azoty	Sell	1.00	854.3	11,368	8.90	−19.5	5.7	17.4
89	B	GPW	Buy	1.50	135.0	1,875	8.60	108.3	1.5	99.8
90	C	PGNIG	Hold	1.00	2,468.4	36,808	7.60	63.1	28.4	3.5
91	C	Forte	Buy	1.50	165.0	2252	8.20	17.5	7.4	20.3
92	B	PGNiG	Sell	1.00	2.3	28	9.00	−776.7	12.1	8.3
93	E	Polmed	Buy	1.00	8.3	100	8.80	17.2	4.9	20.5
94	B	Selvita	Hold	2.00	13.5	209	8.30	94.7	−0.8	−264.0
95	C	Budimex	Buy	2.00	239.6	4,164	8.20	−25.8	7.2	27.6
96	C	Apator	Hold	0.50	87.4	1,171	7.90	54.9	1.8	27.2
97	C	CEZ	Hold	1.00	20,262	472,829	5.40	−37.4	−1.2	−80.1
98	C	Enea	Buy	1.00	1,101.2	14,775	6.40	3.6	27.9	3.6
99	C	Energa	Buy	1.00	1,005.5	5,279	6.00	1.4	30.6	3.3
100	C	PGE	Buy	1.00	2,974.5	55,436	6.90	−10.0	6.7	14.9

Source: own elaboration.

Special attention should be drawn to the recommendations with the perpetual growth rate of zero. Formula (2) implies that such an outcome is possible only in two cases: 1) the reinvestment rate equals zero; 2) the implied RONIC equals zero (which would make no sound sense because RONIC would be considerably below WACC). There is only one such recommendation in the sample (No. 13 prepared by the analyst from brokerage house B).

The implied RONIC equals zero (due to the construction of the formula). Based on the primary data retrieved from the recommendation, the calculated reinvestment rate is negative. Hence, in our opinion this recommendation contains two very serious conceptual mistakes: 1) it is assumed that the company invests at the rate below the alternative cost of capital in the residual period, which violates the fair value estimation principles; 2) it is assumed that the company will disinvest in the residual period, which makes no sense from the standpoint of the 'going concern' assumption: the company will ultimately liquidate its fixed assets and will be forced to discontinue its operations.

Another curious case involves negative perpetual growth rates. We have only one such recommendation in the sample prepared by institution B for Arctic Paper SA (recommendation No. 51). The analyst assumed a continuous growth rate of (–2%), which is explained by the forecasted stagnation of revenues, the decay in profit margins and gradually shrinking market. In line with the traced line of reasoning the analyst assumed that the company would disinvest in the residual period in order to accommodate market shrinkage. However, the implied RONIC is 5 times higher than the cost of capital, which deprives the figures of economic sense. We have a decaying company which envisages disinvestments in the face of industry restructuring, but which can potentially attain a huge return on new investments. For it to make sound economic sense, the disinvestments should take place due to RONIC being below the required rate of return (RONIC < WACC). It would justify negative reinvestment and would allow accommodating a negative continuous growth rate. It also perfectly accords with the decaying profit margins.

Clearly, these recommendations represent anecdotal evidence, but they may be indicative of a pervasive issue undermining the credibility of investment recommendations. In our opinion, there may be a serious misconception underlying the mistakes encountered in the analysed recommendations. There might exist confusion regarding the principal factor contributing to the terminal value. The culprits are perpetual growth rate and RONIC. The analysts may assume that in order to make the growth value neutral in the residual period, one has to assume a zero perpetual growth rate, which is correct only if the reinvestment rate is equal to 0 (RONIC = 0 does not make sense as it is lower than WACC causing the company to disinvest and discontinue its operations). And zero reinvestment rate would make sense only if ROIC=WACC, which would make any incremental investment value neutral. Hence, zero growth rate should be consistent with the reinvestment rate incorporated into the cash flow forecast.

Our findings strongly suggest that the continuous growth rates appearing in the investment recommendations may be estimated without paying due attention to the company's in-depth fundamentals. The implied RONIC rates and reinvestment rates are often inconsistent with the theoretical pillars underlying corporate valuation modelling. This observation should have important practical implications for it may pinpoint the areas requiring remedial action on the part of the recommendation issuers.

3. In-Depth Fundamentals, Market Sentiment or Pure Price Pressure?

The findings presented in the paper may prompt a discussion about the driving force shaping the influence of the investment recommendations on the abnormal returns generated by the recommended stocks.

The profit-making investment strategies based on recommendations have been studied in a vast body of research (Barber et al., 2001; Green, 2006; Zaremba, Konieczka, 2015, Mielcarz et al. (2007) and Mielcarz, Podgórski (2008). However, the factors underlying the influence of recommendations on abnormal returns of the recommended stocks are subject to active debate. Mielcarz (2016) formulated three hypotheses, which may clarify the issue: 1) the influence of the recommendations on the abnormal rates of return may stem from the contents of the recommendations; 2) the mere fact of issuance of the recommendation may cause the effect of price pressure, which has nothing to do with the contents (Womack, 1992); 3) the influence may derive from the factors not related to the contents (Barber, Odean, 2008).

The prevalence of methodologically inaccurate valuation models not grounded on solid economic theory may speak in favour of the price pressure effect unrelated to the contents of the recommendation. The investors may take their decisions basing them solely on the bottom line of the valuation model without taking due care of its methodological correctness. It may appear that recommendations reflect only the currently prevailing market sentiment of financial analysts regarding a particular stock without paying sufficient attention to the fundamentals.

Concluding Remarks

The paper draws attention to the conceptual mistakes which may disqualify the results of terminal value calculation in the equity valuation models. It has been shown, that despite a growing body of specialized literature and high-profile research, valuation models appearing in the investment recommendations in Poland may not be built upon in-depth company fundamentals. The paper highlights areas for improvement on the part of the issuers of the recommendations included in the sample and may be successfully used for educational purposes.

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CO KRYJĄ ZAŁOŻENIA? BŁĘDY METODYCZNE W WYCENACH ANALITYKÓW GIEŁDOWYCH W POLSCE

Streszczenie: Proces wyceny przedsiębiorstw bazuje nie tylko na obiektywnych danych, ale również, ze względu na swoją naturę, odzwierciedla opinie analityków. Pomimo to, zasadnicze znaczenie dla rekomendacji wydawanych przez domy maklerskie ma ich ugruntowanie w teorii ekonomii oraz w istniejących konwencjach metodologicznych. Brak uwzględnienia tych reguł w procesie wyceny może przerodzić nieodłączny element subiektywizmu w pełną arbitralność założeń. Celem niniejszego opracowania jest przedstawienie błędów koncepcyjnych, które mogą pojawić się przy obliczaniu wartości rezydualnej w modelach zdyskontowanych przepływów pieniężnych. W artykule analizujemy kilka postulatów metodycznych oszacowania stopy wzrostu przepływów pieniężnych w okresie rezydualnym. W dalszej części badamy 100 losowo wybranych rekomendacji inwestycyjnych przygotowanych przez analityków domów maklerskich działających w Polsce. Wyniki przeprowadzonych prac wskazują, że postulaty metodologiczne kalkulacji współczynnika wzrostu przepływów w okresie rezydualnym nie są przestrzegane w większości przypadków. Przyjęcie błędnych założeń wejściowych przekłada się na akceptację implikowanych założeń na temat rozwoju spółki, które nie mają ekonomicznego sensu. Te nierealistyczne założenia przygotowywanych wycen mogą kwestionować wiarygodność rekomendacji inwestycyjnych i tworzą podstawy do dyskusji na temat czynników kształtujących decyzje inwestycyjne uczestników rynku.

Słowa kluczowe: RONIC; wycena; stopa wzrostu przepływów pieniężnych w okresie rezydualnym; rekomendacje inwestycyjne

Citation