

# VALUETRUST

## finexpert report capital market data

12 | 2014

Volume 4

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## Preface

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Dear finexpert members,

we are pleased to release the Q4 2014 finexpert capital market data update. This issue contains Q4 2014 capital market data from our website and our estimate for the German risk-free yield curve (Svensson). It shows a graphical description of the development of the industry P/E multiples and the industry beta factors.

Our research corner provides a summary of a working paper recently published at our chair and covering an important question in serial acquisitions: How do failed bids affect bidding behavior, success and performance of subsequent bids? The title of the paper is "Once Bitten, Twice Shy : How Unconsummated Deals Affect Subsequent M&As".

Finally, we want to highlight a presentation of our partner ValueTrust on the hot topic "Public Takeover and Taking Private (Delistings)" given at the 12<sup>th</sup> German Corporate M&A-Congress in Munich. The presentation can be downloaded on [www.value-trust.com](http://www.value-trust.com).



Best regards,

*Bernhard Schwetzler*

Prof. Dr. Bernhard Schwetzler,  
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## People

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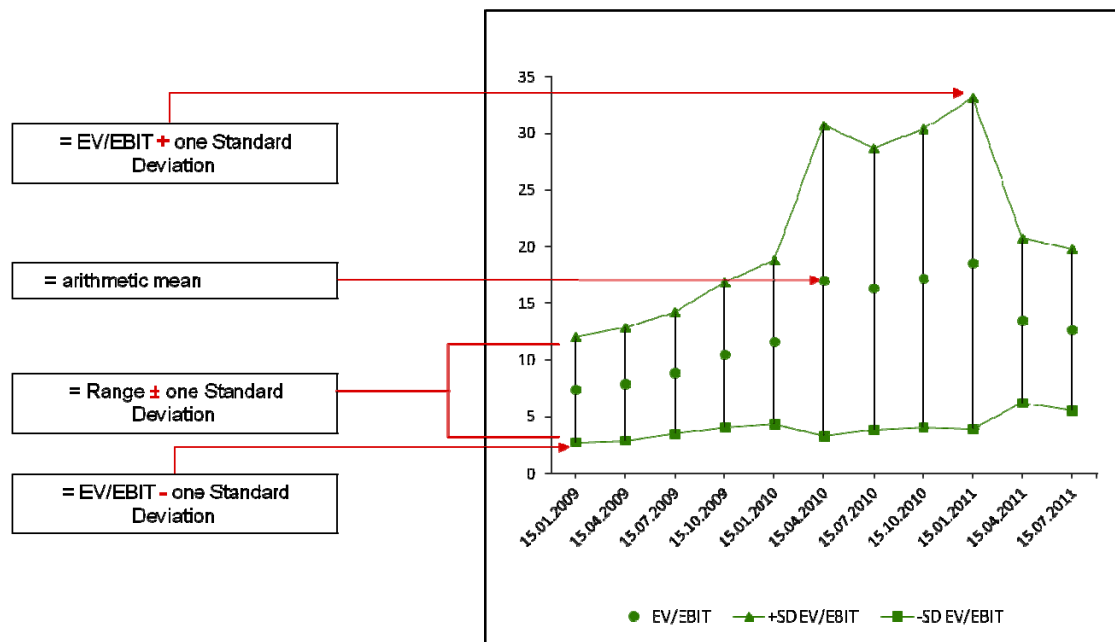
Research Interests: Mathematical & Financial Economics

## Multiples: Procedure

- We estimated industry multiples based on industry indices provided by Deutsche Börse AG
- Time frame: January 2009 – October 2014
- We calculated trailing and 1 year forward EV/EBIT, EV/EBITDA, EV/Sales, P/E, P/Sales
- Earning estimates for forward-multiples have been taken from I/B/E/S
- Data bases on quarterly estimates; Industry composition changes over time
- In each estimation period we excluded outliers multiples beyond the limit of the upper 5%-quantile

## Multiples: How to read our Charts

### Example: EV/EBIT multiple, trailing



In the following charts you will find **forward multiples** (blue) and **trailing multiples** (green) combined in one chart.

## Multiples: P/E

### Executive Summary

- Year-on-Year analysis reveals a negative overall market development
- The telecommunications sectors shows both the highest current P/E multiple and the highest increase
- Earnings expectations are fairly optimistic

### Analysis

Year-on-Year comparison of the trailing P/E multiples<sup>1</sup> shows a significant decrease in valuation for the Prime All Share Standard (from 17.1x to 15.4x), DAX30 (from 17.8x to 15.4x) and MDAX50 (from 19.3x to 17.6x), whereas the TecDAX30 Multiple increases (from 21.0x to 23.8x). The currently highest P/E valuation is obvious in the Telecommunication Sector (23.9x). Due to the very large increase (from 5.4x to 23.9x), the telecommunication sector changed from lowest to highest P/E Multiple within one year. The reason for this development, however, is the change in the industry composition. In contrast to 2013, company data were available for firms with

significantly higher Multiple such as Deutsche Telekom (19.8x) and Ecotel Comm. (28.4x), whereas data were not available for companies with traditionally low multiples such as Drillisch or Telegate. Apart from telecommunication, only construction (from 17.7x to 20.3x) and food & beverages (from 6.3x to 6.7x) show a Y-o-Y increase, being the exception from a rather negative overall market development. The sector Utilities exhibits the highest decrease (from 22.2x to 14.9x). Even though this industry is very sensitive to change in data availability (due to the small number of listed companies), the negative development is still visible in the only company available in 2014: MVV Energie multiple dropped from 22.2x to 14.9x.

<sup>1</sup> Respective due dates are October 15, 2013 (Q4 2013) and 2014 (Q4 2014).  
The following discussion bases on median values to reduce bias through outliers.

## Multiples: P/E

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The current forward multiples display positive earnings expectations for Prime All Share Standard (Trailing 15.4x vs. Forward 15.1x) and his major sub-indices DAX30 (Trailing 15.4x vs. Forward 13.7x), TecDAX30 (Trailing 23.8x vs. Forward 19.5x) and MDAX (Trailing 17.6x vs. Forward 15.6x). This holds true for most of the industries, too. The most optimistic earnings expectations are observed for the construction sector (Trailing 20.3x vs. Forward 13.4x). Only food & beverages (Trailing 6.7x vs. Forward 12.6x) and basic resources (Trailing 12.6x vs. Forward 16.6x) show negative earnings projections.

For the analysis of the trailing and forward P/E multiples we used cut off values of 60.9x and 34.6x respectively to avoid bias through outliers. Both values equal the upper 5% quantile. This led to the exclusion of 12 out of 226 companies for the trailing multiple and 13 out of 248 for the forward multiple. A full list of companies included in the analysis is available under [www.finexpert.info](http://www.finexpert.info) (section "P/E per sector").

## Prime All Share Industries, DAX 30, TecDAX 30, MDAX 50: P/E

as of 15.10.2014

	Trailing P/E				1 YR Forward P/E					
	Arithm. mean	Median	Harm. mean	Variance	n	Arithm. mean	Median	Harm. mean	Variance	n
Automobiles	10.8	10.5	10.1	8.2	10	10.4	10.4	10.0	5.4	10
Banks	14.8	14.8	9.4	158.4	2	11.8	10.4	9.6	42.4	3
Basic Resources	12.4	12.6	1.5	92.1	4	12.8	16.0	2.5	68.8	4
Chemicals	20.5	18.8	14.6	173.8	8	17.9	16.6	16.7	26.9	9
Construction	20.3	20.3	18.5	70.8	2	14.0	13.4	13.8	2.7	4
Consumer	15.0	14.2	3.7	161.3	19	14.9	15.8	5.1	60.3	19
Financial Services	16.2	15.6	7.3	126.4	26	15.9	16.5	10.0	52.9	29
Food & Beverages	6.7	6.7	5.2	20.5	2	12.6	12.6	5.4	178.6	2
Industrial	18.3	16.8	9.4	94.2	50	15.3	13.8	8.3	40.4	55
Insurance	8.1	8.1	8.1	0.5	4	8.4	8.3	8.3	0.0	4
Media	15.8	15.6	10.2	82.8	8	18.2	17.5	16.6	36.6	9
Pharma & Healthcare	21.7	20.5	11.8	138.5	18	18.1	18.4	15.6	40.2	17
Retail	19.1	14.4	16.8	60.3	7	16.9	14.2	7.6	88.5	13
Software	20.9	19.7	16.5	99.8	27	18.4	18.6	15.8	41.6	28
Technology	15.9	14.1	10.2	80.5	14	14.9	14.3	13.8	18.1	14
Telecommunication	21.6	23.9	18.1	75.0	4	18.5	19.7	16.4	42.4	4
Transport. & Logistics	18.2	18.6	16.2	44.7	8	14.3	14.3	12.8	24.5	8
Utilities	14.9	14.9	14.9		1	16.4	13.7	15.0	41.6	3
<b>Prime All Share</b>	<b>17.5</b>	<b>15.4</b>	<b>8.3</b>	<b>104.2</b>	<b>214</b>	<b>15.8</b>	<b>15.1</b>	<b>9.4</b>	<b>44.2</b>	<b>235</b>
<b>DAX 30</b>	<b>16.9</b>	<b>15.4</b>	<b>14.0</b>	<b>70.8</b>	<b>23</b>	<b>14.7</b>	<b>13.7</b>	<b>13.2</b>	<b>27.5</b>	<b>28</b>
<b>TecDAX 30</b>	<b>24.0</b>	<b>23.8</b>	<b>15.6</b>	<b>141.7</b>	<b>23</b>	<b>18.6</b>	<b>19.5</b>	<b>16.3</b>	<b>37.7</b>	<b>22</b>
<b>MDAX 50</b>	<b>17.8</b>	<b>17.6</b>	<b>12.8</b>	<b>88.2</b>	<b>39</b>	<b>16.4</b>	<b>15.6</b>	<b>14.6</b>	<b>29.7</b>	<b>44</b>

Prime All Share Industries

## Development of Multiples P/E - Indices

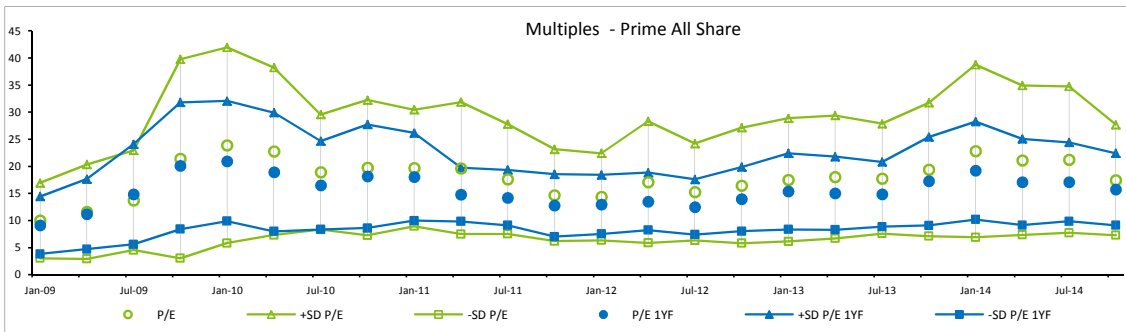


Fig. 1: P/E - Prime All Share

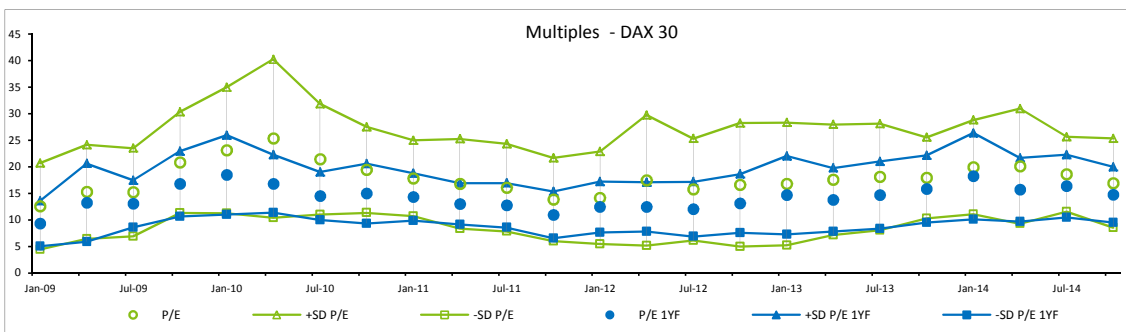


Fig. 2: P/E - DAX 30

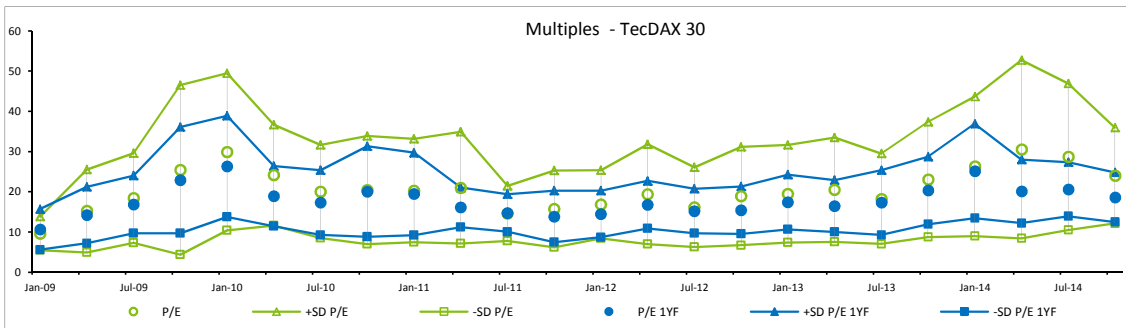


Fig. 3: P/E - TecDAX 30

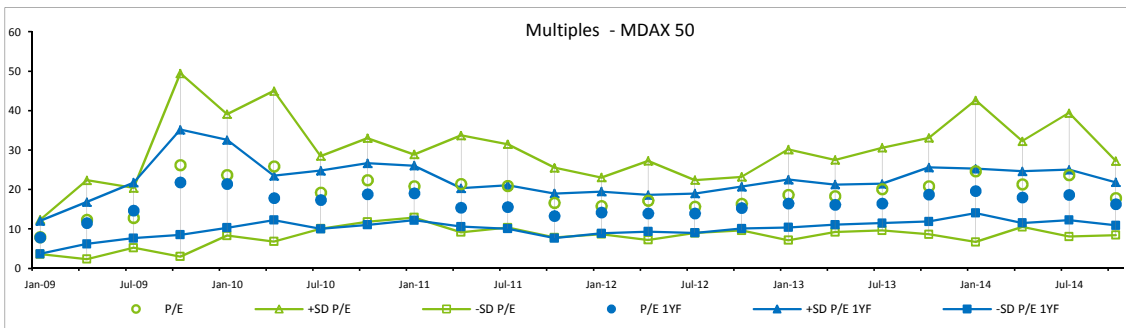


Fig. 4: P/E - MDAX 50



### Development of Multiples P/E - Per Industry I/V

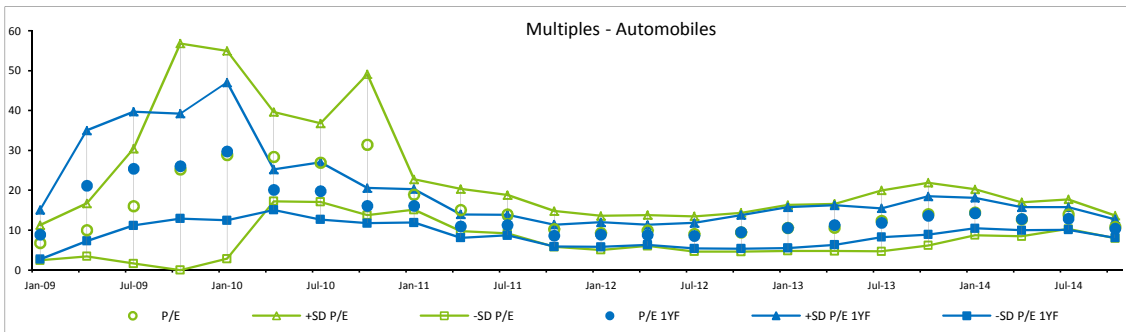


Fig. 5: P/E - Automobiles

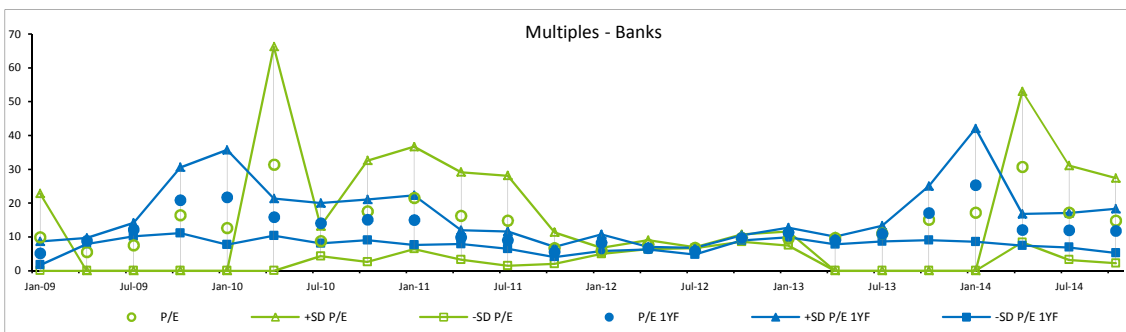


Fig. 6: P/E - Consumer

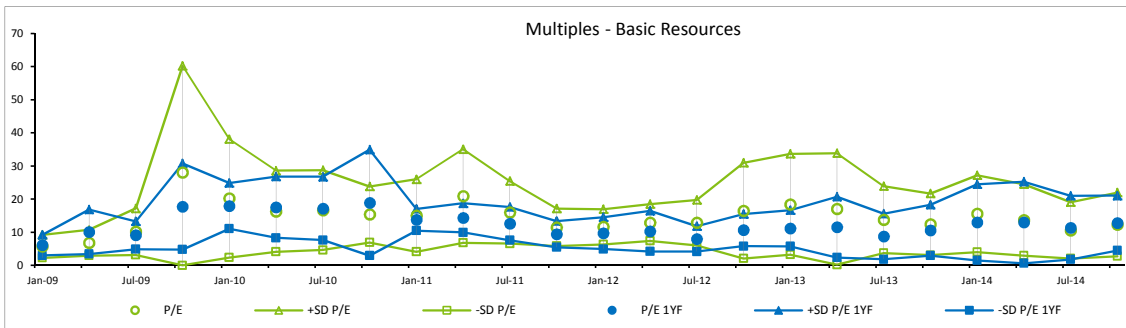


Fig. 7: P/E - Basic Resources

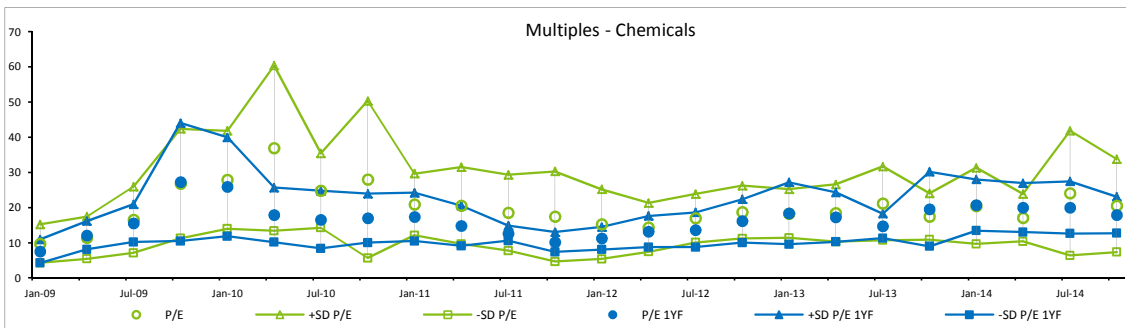


Fig. 8: P/E - Chemicals

### Development of Multiples P/E - Per Industry II/V

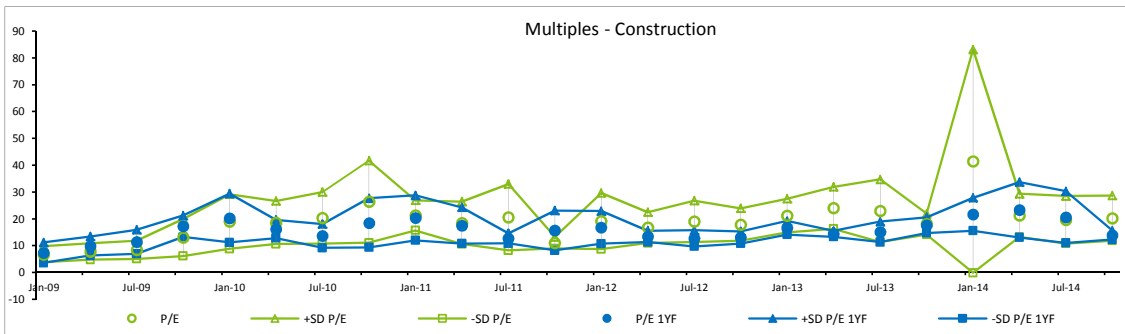


Fig. 9: P/E - Construction

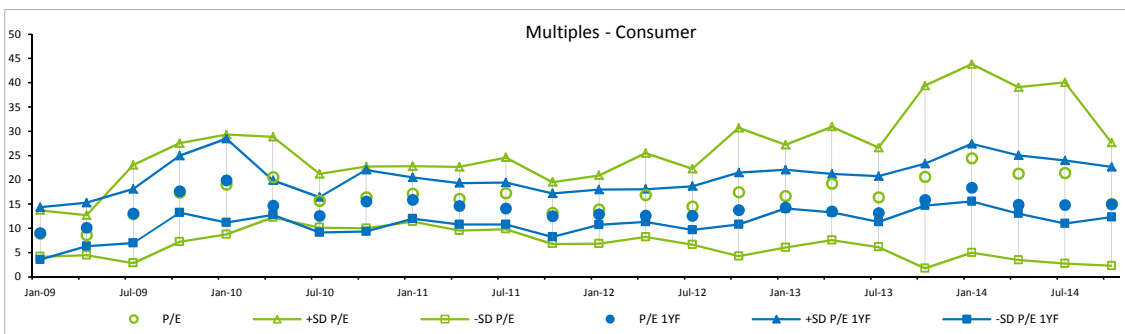


Fig. 10: P/E - Consumer

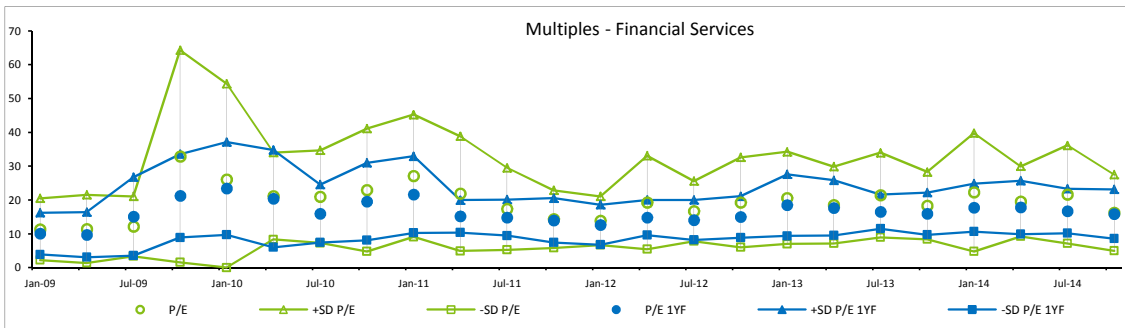


Fig. 11: P/E - Financial Services

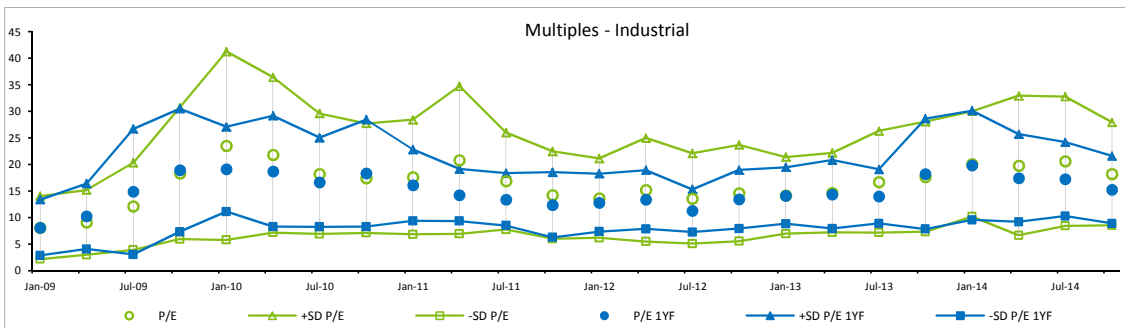


Fig. 12: P/E - Industrial

### Development of Multiples P/E - Per Industry III/V

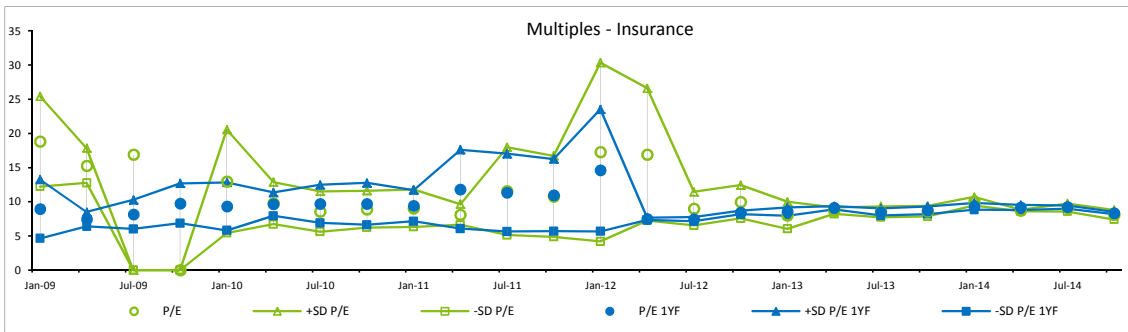


Fig. 13: P/E - Insurance

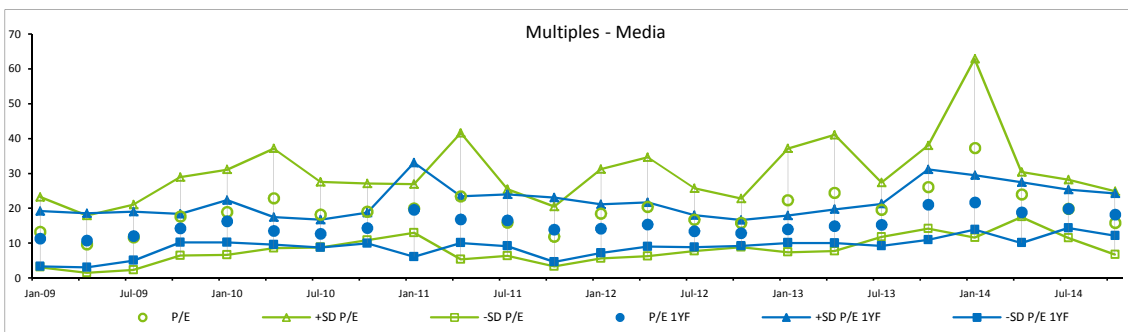


Fig. 14: P/E - Media

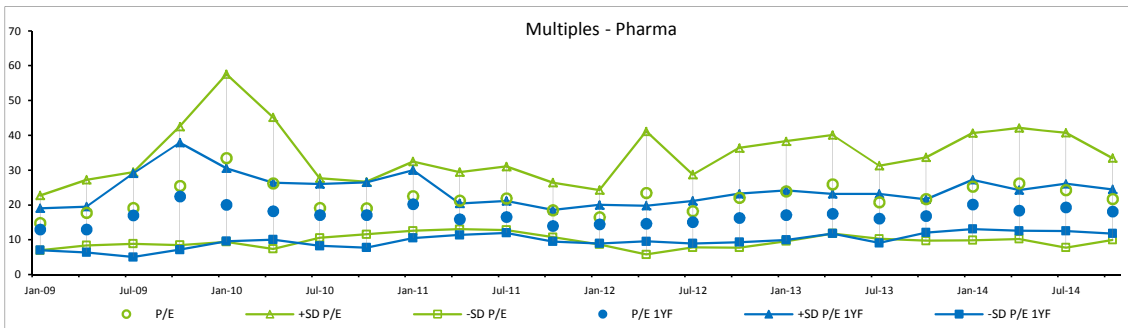


Fig. 15: P/E - Pharma

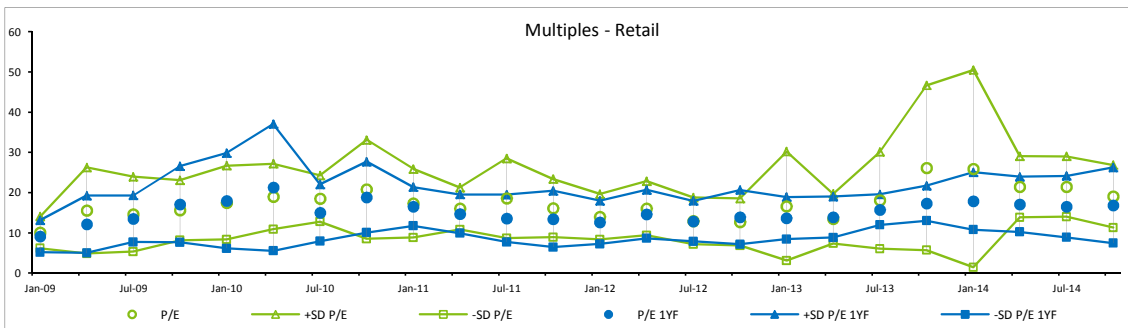


Fig. 16: P/E - Retail

### Development of Multiples P/E - Per Industry IV/V

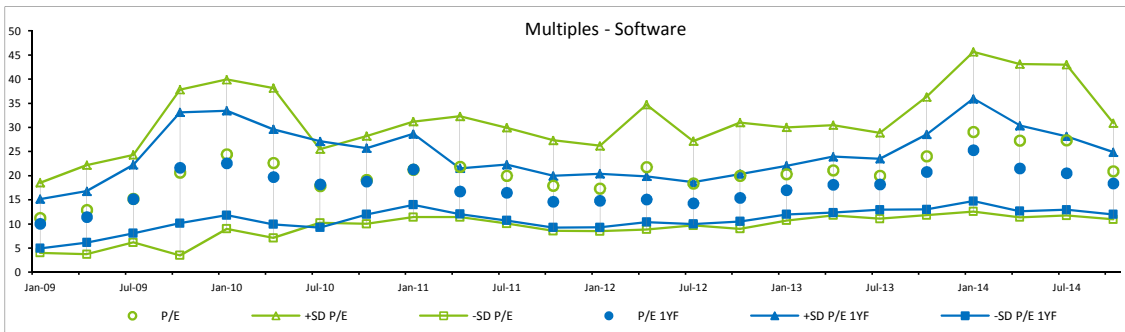


Fig. 17: P/E - Software

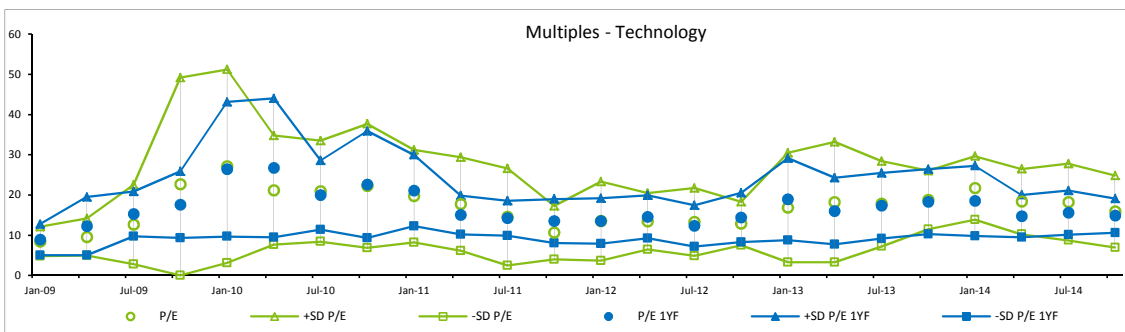


Fig. 18: P/E - Technology

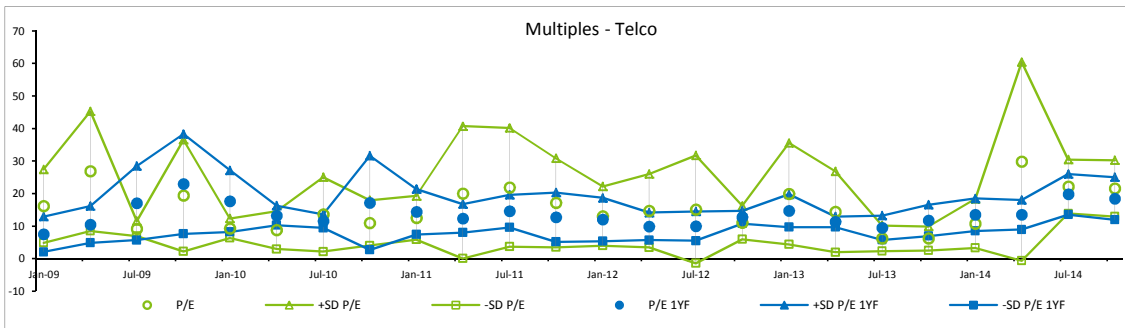


Fig. 19: P/E - Telecommunication

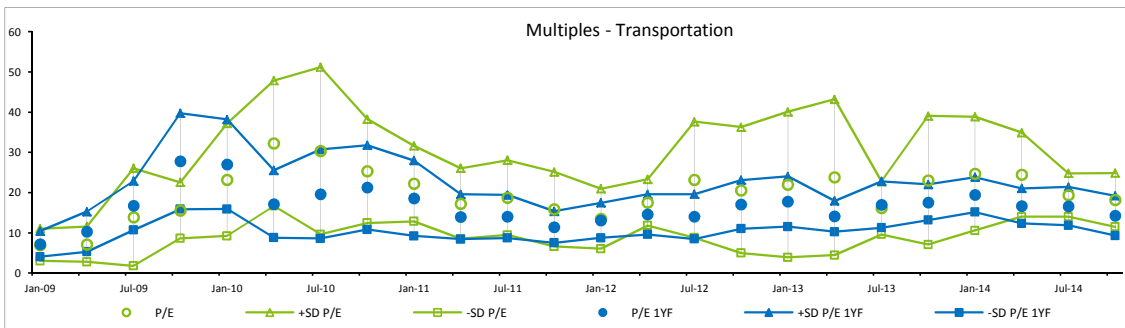


Fig. 20: P/E - Transportation & Logistics

### Development of Multiples P/E - Per Industry V/V

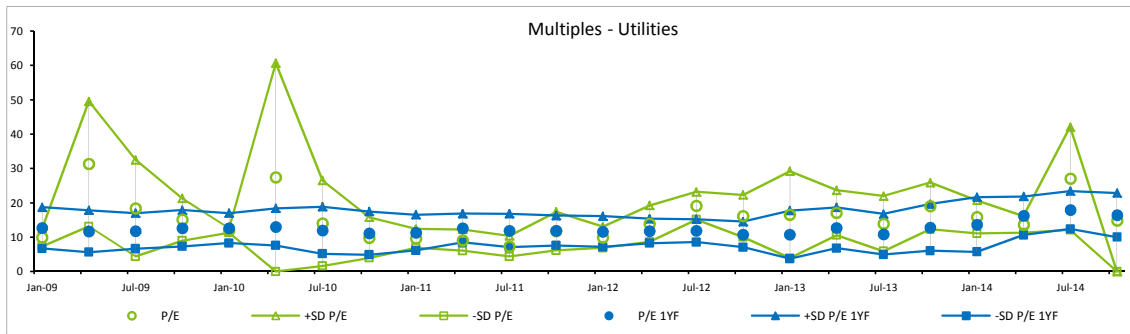


Fig. 21: P/E - Utilities

## Prime All Share Industries, DAX 30, TecDAX 30, MDAX 50: EV/EBIT

as of 15.10. 2014

	Trailing EV/EBIT				1 YR Forward EV/EBIT					
	Arithm. mean	Median	Harm. mean	Variance	n	Arithm. mean	Median	Harm. mean	Variance	n
Automobiles	11.3	11.5	11.2	1.2	10	10.6	10.2	10.2	4.6	10
Basic Resources	12.5	12.5	12.1	10.4	2	10.0	11.3	2.2	47.2	4
Chemicals	18.8	16.3	14.0	145.2	9	14.8	15.5	13.3	21.8	10
Construction	14.7	14.3	9.3	90.2	4	12.1	12.8	10.7	18.7	5
Consumer	13.8	13.1	6.5	59.7	17	12.1	11.3	10.7	18.2	15
Food & Beverages	7.3	7.3	7.3		1	18.4	18.4	18.4		1
Industrial	14.7	11.6	9.0	118.8	54	11.4	10.6	9.9	15.4	54
Media	16.0	13.1	7.0	105.3	11	12.1	10.8	10.6	23.2	9
Pharma & Healthcare	16.7	15.0	11.8	128.3	15	12.4	11.9	10.1	25.0	15
Retail	14.0	11.3	11.4	68.9	10	10.8	10.5	9.7	13.4	10
Software	21.2	16.2	13.4	203.5	28	12.7	12.2	9.4	28.8	29
Technology	13.1	11.2	10.1	36.2	15	11.5	10.3	10.1	24.4	15
Telecommunication	11.1	9.7	8.9	39.0	4	12.1	11.7	11.6	7.2	4
Transport. & Logistics	13.3	13.5	12.0	16.1	8	10.8	11.2	9.1	15.4	8
Utilities	9.9	9.9	9.3	11.3	2	10.5	9.2	9.8	10.9	3
<b>Prime All Share</b>	<b>15.4</b>	<b>12.2</b>	<b>9.7</b>	<b>106.3</b>	<b>190</b>	<b>11.9</b>	<b>11.2</b>	<b>9.4</b>	<b>19.4</b>	<b>192</b>
<b>DAX 30</b>	<b>13.2</b>	<b>12.8</b>	<b>12.1</b>	<b>14.5</b>	<b>19</b>	<b>11.7</b>	<b>11.2</b>	<b>11.2</b>	<b>7.6</b>	<b>22</b>
<b>TecDAX 30</b>	<b>16.1</b>	<b>15.0</b>	<b>13.3</b>	<b>46.2</b>	<b>21</b>	<b>13.7</b>	<b>13.3</b>	<b>12.6</b>	<b>18.6</b>	<b>21</b>
<b>MDAX 50</b>	<b>17.3</b>	<b>12.3</b>	<b>12.4</b>	<b>142.1</b>	<b>34</b>	<b>12.1</b>	<b>11.5</b>	<b>10.8</b>	<b>17.0</b>	<b>36</b>

## Prime All Share Industries, DAX 30, TecDAX 30, MDAX 50: EV/EBITDA

as of 15.10.2014

	Trailing EV/EBITDA				1 YR Forward EV/EBITDA					
	Arithm. mean	Median	Harm. mean	Variance	n	Arithm. mean	Median	Harm. mean	Variance	n
Automobiles	6.9	6.7	6.8	1.0	10	6.6	6.3	6.4	1.6	10
Basic Resources	7.5	7.5	7.1	6.0	2	5.8	7.5	1.7	10.0	5
Chemicals	10.9	9.1	9.2	23.0	11	8.3	7.8	7.6	7.1	10
Construction	7.2	7.4	5.2	14.9	4	7.0	7.0	5.9	10.0	5
Consumer	8.3	7.7	4.9	15.4	18	8.0	8.0	7.1	7.7	16
Food & Beverages	4.9	4.9	4.9		1	7.8	7.8	7.8		1
Industrial	8.6	7.7	6.2	19.3	57	7.9	7.1	6.7	10.5	58
Media	7.6	7.9	4.2	20.8	11	8.3	8.5	7.0	7.8	10
Pharma & Healthcare	10.7	10.7	8.4	19.8	18	9.3	9.1	7.4	13.8	17
Retail	9.3	9.1	8.2	10.2	11	7.7	8.0	6.4	11.3	11
Software	12.6	12.1	8.9	36.0	27	9.6	9.3	6.8	16.9	29
Technology	7.9	7.5	5.8	22.9	18	6.4	5.5	5.4	7.2	17
Telecommunication	6.3	5.4	5.9	3.4	6	8.3	7.7	7.0	14.8	5
Transport. & Logistics	6.3	6.9	5.8	3.8	8	6.5	5.9	5.5	9.7	9
Utilities	5.3	4.6	5.1	1.8	3	5.7	5.1	5.5	1.4	3
<b>Prime All Share</b>	<b>9.0</b>	<b>8.1</b>	<b>6.4</b>	<b>21.5</b>	<b>205</b>	<b>7.9</b>	<b>7.6</b>	<b>6.1</b>	<b>10.9</b>	<b>206</b>
<b>DAX 30</b>	<b>8.5</b>	<b>7.4</b>	<b>7.3</b>	<b>13.4</b>	<b>21</b>	<b>7.6</b>	<b>7.9</b>	<b>7.1</b>	<b>3.7</b>	<b>22</b>
<b>TecDAX 30</b>	<b>11.7</b>	<b>10.4</b>	<b>9.7</b>	<b>25.1</b>	<b>24</b>	<b>10.3</b>	<b>10.3</b>	<b>9.3</b>	<b>10.9</b>	<b>26</b>
<b>MDAX 50</b>	<b>9.4</b>	<b>8.8</b>	<b>7.9</b>	<b>14.1</b>	<b>35</b>	<b>8.0</b>	<b>7.5</b>	<b>7.1</b>	<b>7.5</b>	<b>37</b>

## Prime All Share Industries, DAX 30, TecDAX 30, MDAX 50: EV/Sales

as of 15.10.2014

	Trailing EV/Sales				1 YR Forward EV/Sales					
	Arithm. mean	Median	Harm. mean	Variance	n	Arithm. mean	Median	Harm. mean	Variance	n
Automobiles	0.9	0.9	0.7	0.2	10	0.9	0.9	0.7	0.1	10
Basic Resources	0.8	0.5	0.4	0.4	5	0.6	0.3	0.3	0.3	5
Chemicals	1.4	1.2	0.8	0.8	12	1.4	1.2	0.8	0.6	12
Construction	0.7	0.7	0.4	0.2	5	0.7	0.6	0.4	0.2	5
Consumer	0.9	0.7	0.5	0.4	19	0.9	0.7	0.7	0.4	16
Food & Beverages	0.5	0.5	0.5		1	0.6	0.6	0.6		1
Industrial	0.9	0.7	0.5	0.5	66	0.9	0.7	0.6	0.4	64
Media	1.6	1.7	0.7	1.5	11	1.5	1.5	0.6	1.1	11
Pharma & Healthcare	1.8	1.5	1.3	0.9	21	1.8	1.7	1.4	0.7	20
Retail	1.0	0.7	0.6	0.6	15	1.1	0.7	0.5	1.4	14
Software	1.8	1.3	0.4	2.2	31	1.5	1.1	0.7	1.4	28
Technology	1.0	0.6	0.6	1.0	20	0.9	0.6	0.5	0.8	19
Telecommunication	1.3	0.6	0.5	1.8	8	1.4	0.9	0.6	1.9	7
Transport. & Logistics	1.0	0.6	0.4	0.9	9	1.0	0.6	0.4	1.0	9
Utilities	0.5	0.6	0.5	0.0	3	0.5	0.6	0.5	0.0	3
<b>Prime All Share</b>	<b>1.2</b>	<b>0.8</b>	<b>0.5</b>	<b>1.0</b>	<b>236</b>	<b>1.1</b>	<b>0.8</b>	<b>0.6</b>	<b>0.8</b>	<b>224</b>
<b>DAX 30</b>	<b>1.4</b>	<b>1.1</b>	<b>1.0</b>	<b>0.7</b>	<b>22</b>	<b>1.3</b>	<b>1.2</b>	<b>0.9</b>	<b>0.7</b>	<b>22</b>
<b>TecDAX 30</b>	<b>2.2</b>	<b>1.9</b>	<b>1.2</b>	<b>2.3</b>	<b>27</b>	<b>1.9</b>	<b>1.9</b>	<b>1.1</b>	<b>1.6</b>	<b>27</b>
<b>MDAX 50</b>	<b>1.2</b>	<b>0.9</b>	<b>0.6</b>	<b>0.9</b>	<b>38</b>	<b>1.2</b>	<b>0.9</b>	<b>0.6</b>	<b>0.9</b>	<b>38</b>



## Prime All Share Industries, DAX 30, TecDAX 30, MDAX 50: Price/Sales

as of 15.10.2014

	Trailing Price/Sales				1 YR Forward Price/Sales					
	Arithm. mean	Median	Harm. mean	Variance	n	Arithm. mean	Median	Harm. mean	Variance	n
Automobiles	0.6	0.5	0.5	0.1	10	0.6	0.5	0.4	0.1	10
Banks	1.0	0.8	0.9	0.3	3	1.5	1.3	1.3	0.2	3
Basic Resources	0.6	0.3	0.2	0.4	6	0.5	0.2	0.2	0.4	5
Chemicals	1.1	0.9	0.4	0.7	12	1.1	0.9	0.4	0.6	12
Construction	0.3	0.2	0.2	0.1	5	0.3	0.2	0.2	0.1	5
Consumer	0.8	0.6	0.2	0.6	21	0.8	0.6	0.3	0.6	20
Financial Services	3.2	3.1	1.7	3.8	26	3.5	3.4	2.2	3.6	27
Food & Beverages	0.3	0.3	0.3	0.0	2	0.3	0.3	0.3	0.0	2
Industrial	0.8	0.7	0.1	0.6	72	0.8	0.6	0.4	0.5	68
Insurance	0.4	0.5	0.4	0.0	4	0.4	0.5	0.4	0.0	4
Media	1.7	1.3	0.8	2.2	12	1.6	1.2	0.7	1.6	12
Pharma & Healthcare	1.9	1.3	1.2	2.1	22	2.0	1.7	1.3	1.8	21
Retail	1.0	0.7	0.4	0.9	15	1.2	0.6	0.4	3.0	15
Software	2.1	1.6	1.0	3.2	32	2.0	1.6	1.1	2.7	30
Technology	1.0	0.5	0.5	1.8	21	1.0	0.5	0.5	1.5	19
Telecommunication	1.3	0.8	0.6	2.0	8	1.4	0.8	0.7	2.1	7
Transport. & Logistics	0.5	0.4	0.2	0.3	9	0.5	0.4	0.2	0.3	9
Utilities	0.3	0.3	0.3	0.0	3	0.3	0.3	0.3	0.0	3
<b>Prime All Share</b>	<b>1.3</b>	<b>0.8</b>	<b>0.2</b>	<b>2.0</b>	<b>283</b>	<b>1.3</b>	<b>0.8</b>	<b>0.5</b>	<b>2.1</b>	<b>272</b>
<b>DAX 30</b>	<b>1.2</b>	<b>0.8</b>	<b>0.6</b>	<b>1.1</b>	<b>28</b>	<b>1.2</b>	<b>0.8</b>	<b>0.6</b>	<b>1.0</b>	<b>28</b>
<b>TecDAX 30</b>	<b>2.3</b>	<b>1.8</b>	<b>1.3</b>	<b>3.2</b>	<b>27</b>	<b>2.2</b>	<b>1.8</b>	<b>1.2</b>	<b>2.7</b>	<b>28</b>
<b>MDAX 50</b>	<b>1.4</b>	<b>0.8</b>	<b>0.5</b>	<b>2.0</b>	<b>46</b>	<b>1.5</b>	<b>0.9</b>	<b>0.5</b>	<b>2.5</b>	<b>47</b>

## CAPM Beta Factors

### Executive Summary

- Beta Factors of German Indices remain stable
- The quality of estimation of industry betas remains robust for most Industries

### Analysis

In this report we present and analyze the 1 and 2 year betafactors with their respective coefficient of determination ( $R^2$ ). Note that we switched from 200 days to 261 days for the short term beta in the Q2 report in order to capture a full years' trading days. We use the German Prime All Share index as market proxy. The development of the betafactors can be analyzed using the graphical representations of the beta factors where the 1 year beta shows recent trends whereas the 2 year beta is less influenced by singularities and should be thus smoothed. The quality and hence reliability of the estimation of betafactors is measured by the coefficient of determination.

The beta factors show a stable development with constant estimation quality. The slight decrease in the 1 year betafactor for DAX is not accompanied by a corresponding change in the coefficient of determination whereas the quality of estimation for the 200 day betafactor of TecDAX increased while the estimator itself remained stable.

The betafactors of Construction and Insurance Sectors decreased

accompanied by a drop in model power. In contrast to this, Chemical, Industrial, Pharma and Healthcare, Telecommunication and Transport and Logistics Sectors are characterized by increasing beta factors and increasing  $R^2$ .

The betafactors of the Automobiles sector decreased at a constant coefficient of determination while the betafactors of Banks sector slightly decreased at an increasing quality of estimation. The betafactors of the Basic Resources Sector developed relatively stable while the coefficient of determination materially increased.

The 1 year betafactor of the Utilities sector slightly increased together with a material increase in the quality of estimation. The 2 year betafactor as well as the coefficient of estimation remain stable. Similarly, the Media Sector shows an increasing 1 year beta with increasing quality of estimation while the 2 year betafactor and the respective coefficient of determination decreased.

Finally, the Food and Beverages Sector shows a material increase in betafactors while the quality of estimation is still low due to its small constituent list.

## Prime All Share Industries, DAX 30, TecDAX 30, MDAX 50: Betas and Debt-to-Equity Ratios

as of 15.10.2014

	1 year Equity Beta	R <sup>2</sup>	n	Cost of Equity	Debt - Equity Ratio (Market Values)	Asset Beta	Asset Beta Miles Ezzell (Debt Beta = 0.3)	Net-Debt - Equity Ratio (Market Values)	Operating Asset Beta	Operating Asset Beta Miles Ezzell (Debt Beta = 0.3)
Automobiles	1.16	0.79	12	7.1%	1.42	0.60	0.65	1.08	0.68	0.71
Banks	1.18	0.53	3	7.2%						
Basic Resources	1.09	0.55	6	6.7%	1.12	0.63	0.67	0.77	0.72	0.75
Chemicals	1.13	0.85	14	7.0%	0.30	0.95	0.95	0.24	0.98	0.98
Construction	0.95	0.43	5	6.0%	1.11	0.55	0.60	0.75	0.64	0.67
Consumer	0.75	0.55	27	4.9%	0.10	0.70	0.71	-0.02	0.76	0.76
Financial Services	0.63	0.56	32	4.2%						
Food & Beverages	0.67	0.05	2	4.5%	1.25	0.37	0.44	0.95	0.42	0.48
Industrial	1.04	0.83	77	6.5%	0.43	0.81	0.83	0.22	0.91	0.91
Insurance	0.84	0.66	4	5.4%						
Media	0.78	0.43	12	5.0%	0.22	0.68	0.69	0.14	0.71	0.72
Pharma & Healthcare	0.67	0.50	33	4.4%	0.33	0.55	0.57	0.23	0.58	0.60
Retail	0.73	0.42	20	4.8%	0.48	0.55	0.58	0.25	0.62	0.64
Software	0.86	0.54	33	5.5%	0.09	0.81	0.81	0.03	0.84	0.84
Technology	1.09	0.49	21	6.7%	0.12	1.01	1.01	-0.15	1.21	1.21
Telecommunication	0.96	0.52	8	6.0%	0.89	0.61	0.65	0.70	0.66	0.69
Transport. & Logistics	1.22	0.71	10	7.5%	0.71	0.84	0.85	0.39	0.98	0.98
Utilities	0.92	0.40	4	5.8%	1.60	0.45	0.52	1.02	0.55	0.60
<b>Prime All Share</b>	1.00	1.00	323	6.3%	0.62	0.71	0.73	0.43	0.78	0.79
DAX 30	1.04	0.99	30	6.5%	0.61	0.75	0.77	0.45	0.80	0.82
TecDAX 30	1.01	0.70	30	6.3%	0.13	0.93	0.93	-0.02	1.02	1.02
MDAX 50	0.83	0.81	50	5.3%	0.39	0.66	0.68	0.17	0.75	0.76

## Prime All Share Industries, DAX 30, TecDAX 30, MDAX 50: Cost of Capital

as of 15.10.2014

	Median ROE (Return on Equity)	Median Non- Cash ROE (Return on Equity)	Median ROC (Return on Capital)	Median Non- cash ROC (Return on Capital)	Median Capex / Depr.	Median Dividend payout
Automobiles	0.20	0.12	0.12	0.13	1.15	0.33
Banks					1.80	0.00
Basic Resources	-0.01	0.01	0.01	0.01	0.84	0.23
Chemicals	0.10	0.09	0.08	0.09	1.18	0.47
Construction	0.05	-0.04	0.06	0.07	0.90	1.32
Consumer	0.11	0.07	0.08	0.09	1.11	0.44
Financial Services	0.01		0.03		9.69	0.26
Food & Beverages	0.14	0.06	0.11	0.13	0.80	0.46
Industrial	0.13	0.08	0.10	0.12	0.79	0.26
Insurance					1.89	0.42
Media	0.04	0.09	0.05	0.12	0.51	0.97
Pharma & Healthcare	0.03	0.04	0.05	0.07	0.46	0.29
Retail	0.03	0.05	0.04	0.04	1.03	0.28
Software	0.15	0.08	0.12	0.17	0.52	0.29
Technology	0.05	0.03	0.05	0.06	0.55	0.25
Telecommunication	0.05	0.02	0.03	0.03	0.59	0.72
Transport. & Logistics	0.11	0.04	0.07	0.08	1.07	0.52
Utilities	0.07	0.04	0.06	0.06	1.28	0.84
<b>Prime All Share</b>	<b>0.09</b>	<b>0.06</b>	<b>0.08</b>	<b>0.10</b>	<b>0.79</b>	<b>0.33</b>
DAX 30	0.18	0.10	0.09	0.11	1.14	0.38
TecDAX 30	0.16	0.09	0.13	0.18	0.51	0.33
MDAX 50	0.11	0.09	0.08	0.12	1.26	0.38

### Development of CAPM Beta Factors - Indices

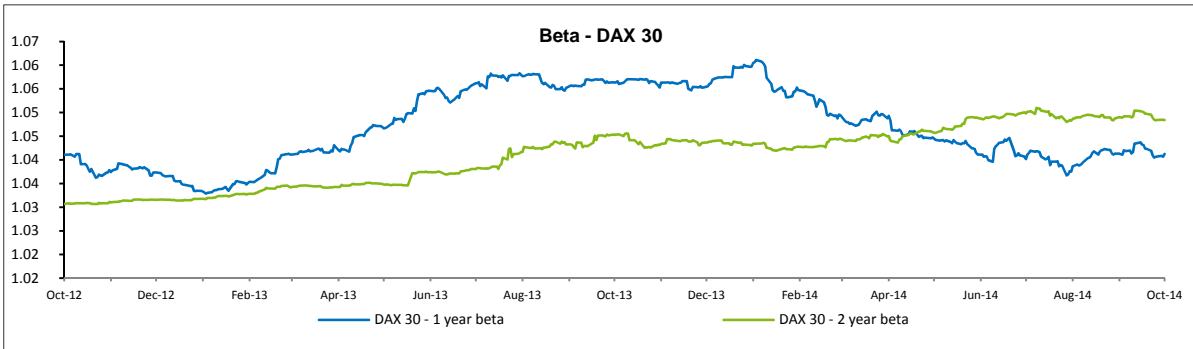


Fig. 22: CAPM Beta - DAX 30

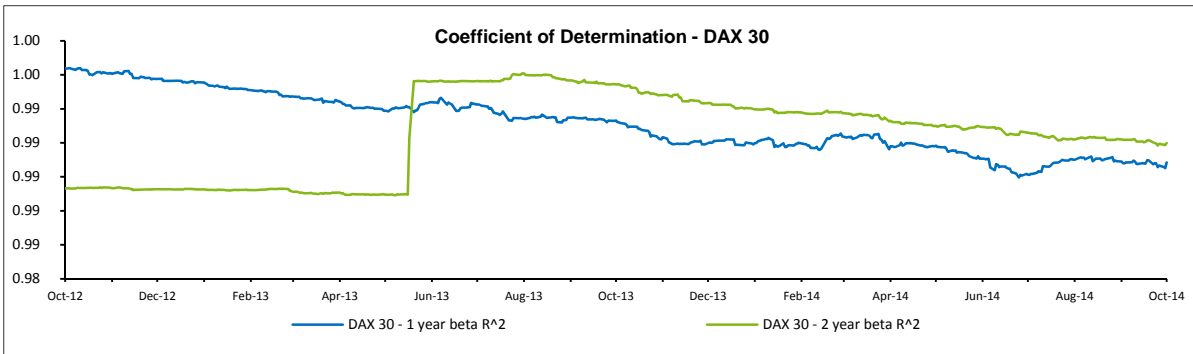


Fig. 23: CAPM R<sup>2</sup> - DAX 30

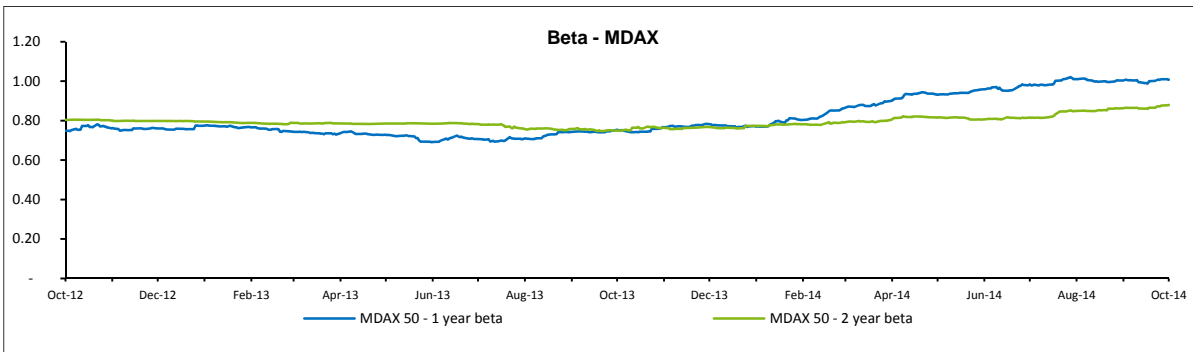


Fig. 24: CAPM Beta - MDAX

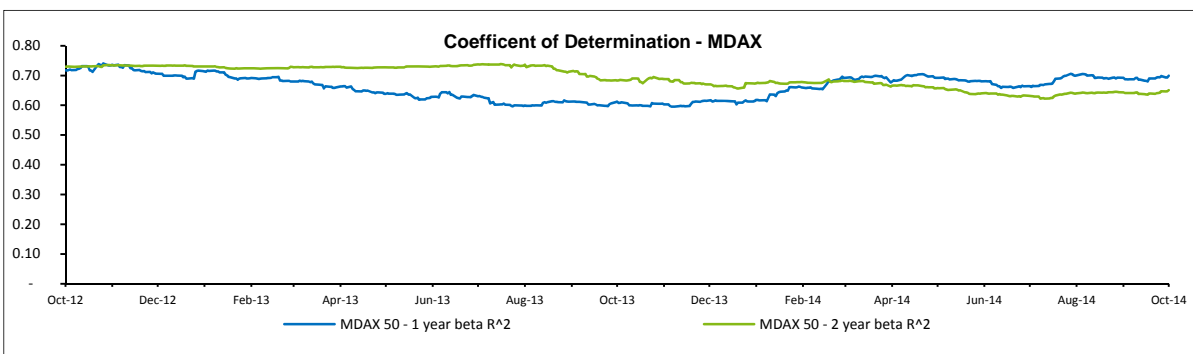


Fig. 25: CAPM R<sup>2</sup> - MDAX

## Development of CAPM Beta Factors - Indices

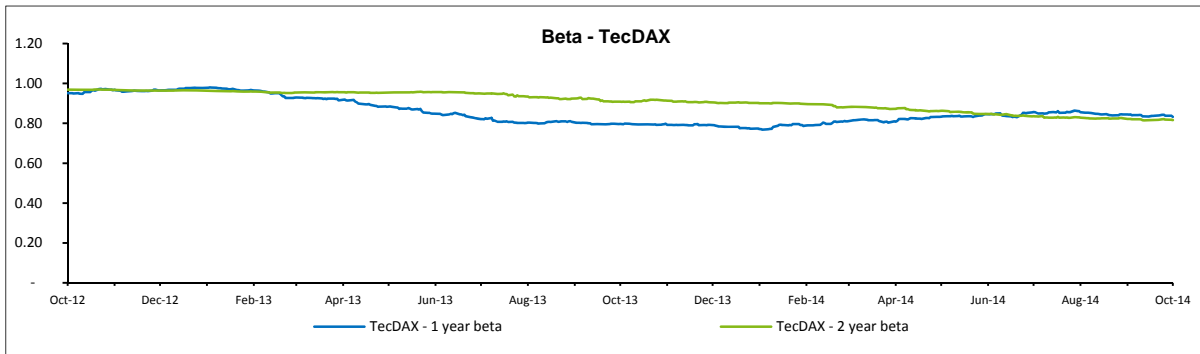


Fig. 26: CAPM Beta - TecDAX

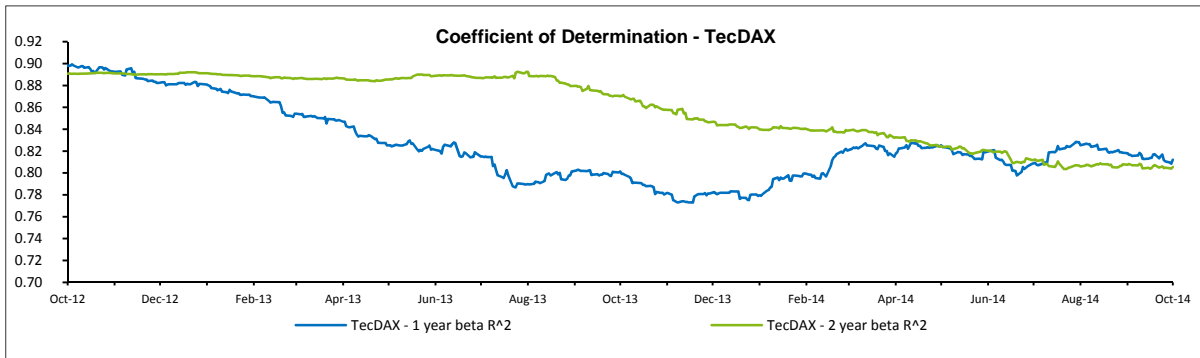


Fig. 27: CAPM R<sup>2</sup> - TecDAX

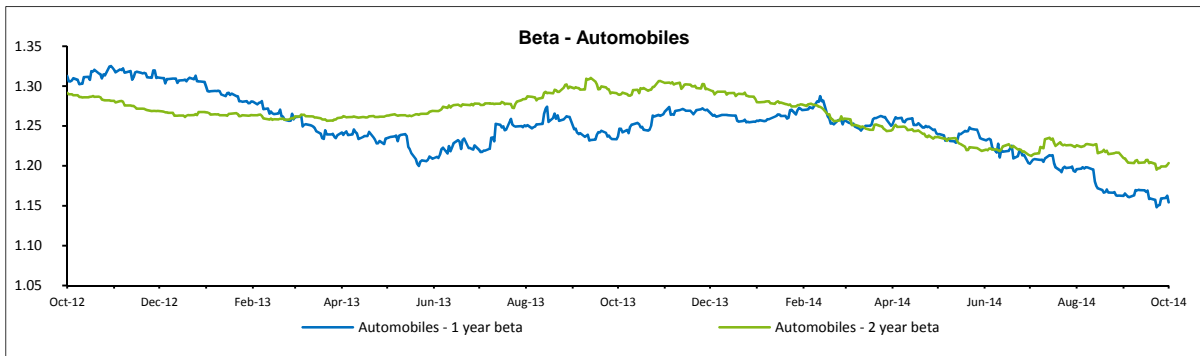


Fig. 28: CAPM Beta - Automobiles

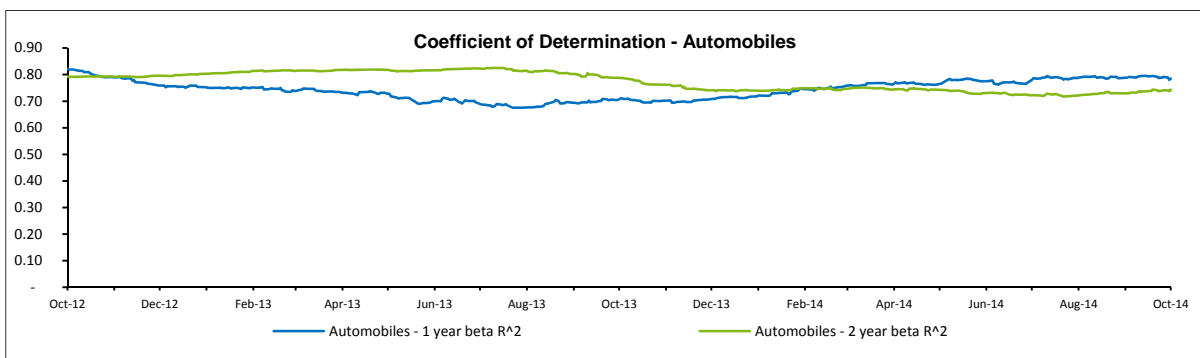


Fig. 29: CAPM R<sup>2</sup> - Automobiles

### Development of CAPM Beta Factors - Per Industry I/IX

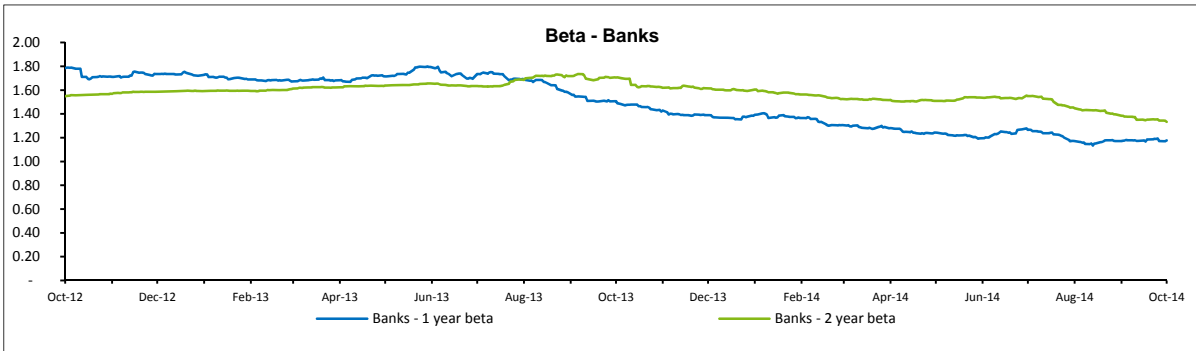


Fig. 30: CAPM Beta - Banks

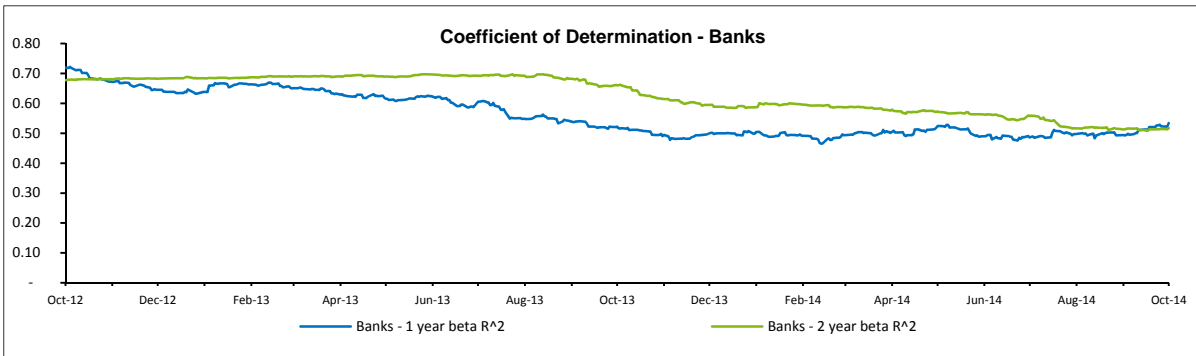


Fig. 31: CAPM R<sup>2</sup> - Banks

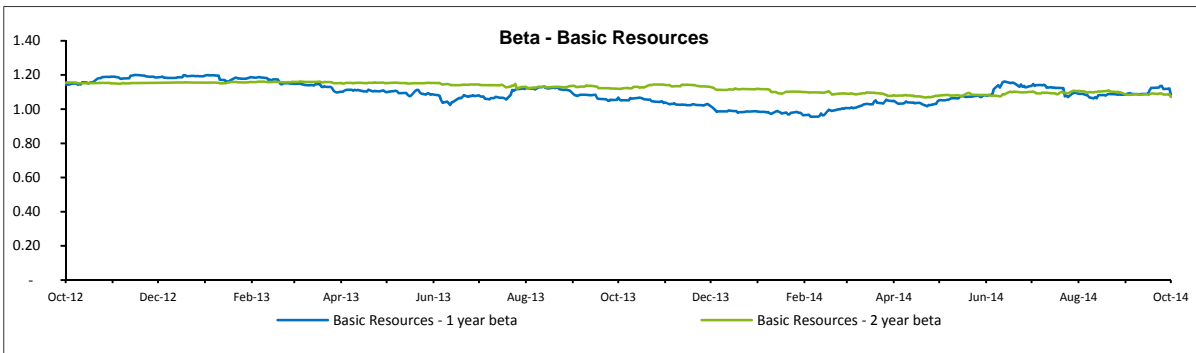


Fig. 32: CAPM Beta - Basic Resources

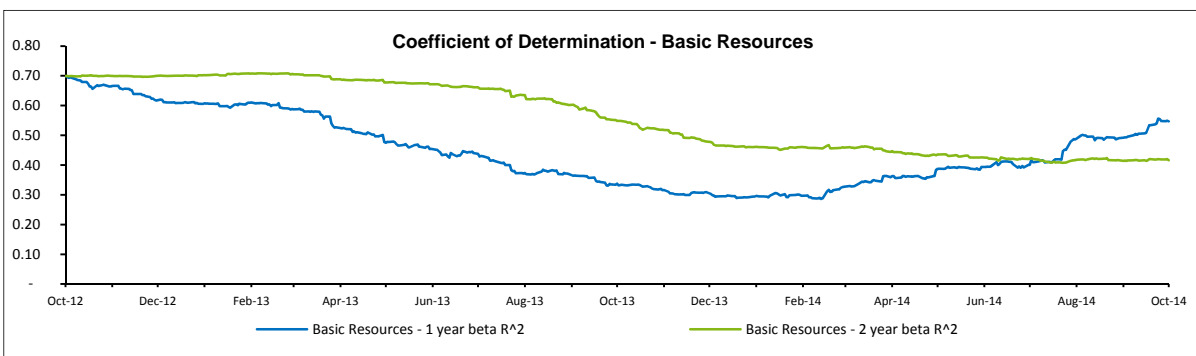


Fig. 33: CAPM R<sup>2</sup> - Basic Resources

### Development of CAPM Beta Factors - Per Industry II/IX

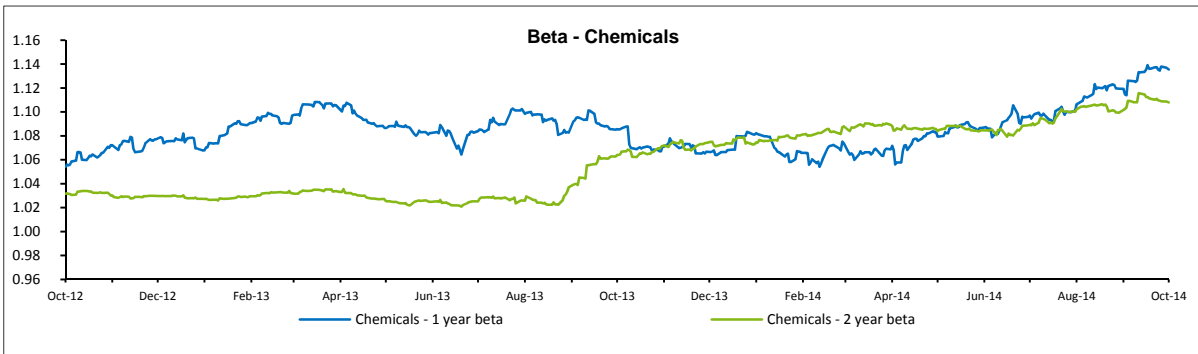


Fig. 34: CAPM Beta - Chemicals

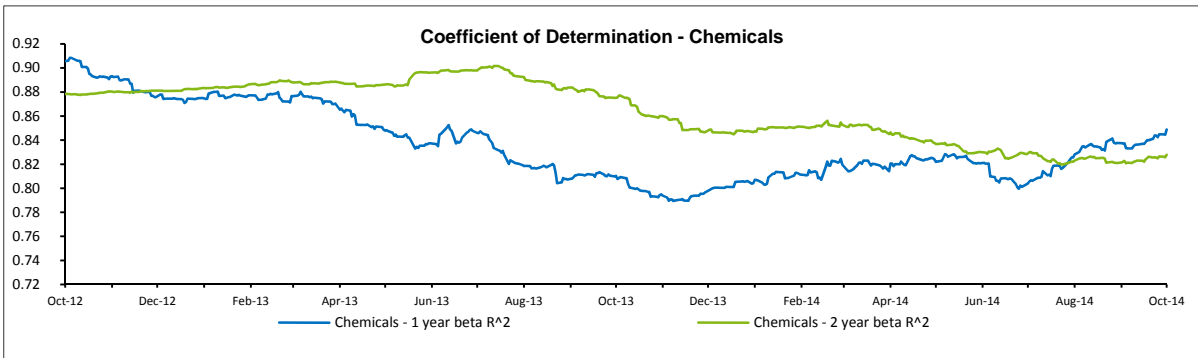


Fig. 35: CAPM R<sup>2</sup> - Chemicals

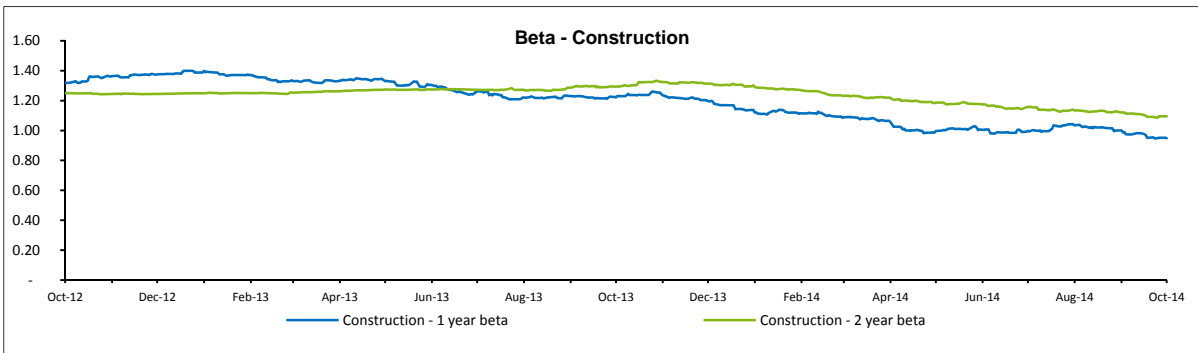


Fig. 36: CAPM Beta - Construction

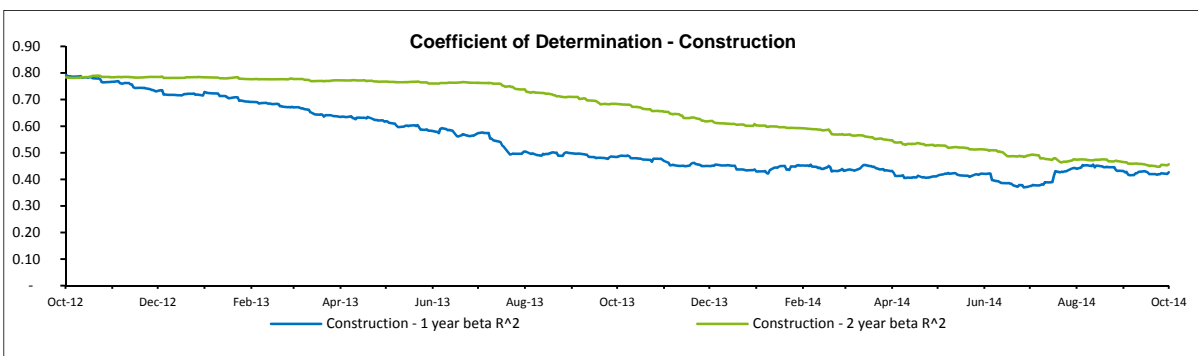


Fig. 37: CAPM R<sup>2</sup> - Construction



### Development of CAPM Beta Factors - Per Industry III/IX

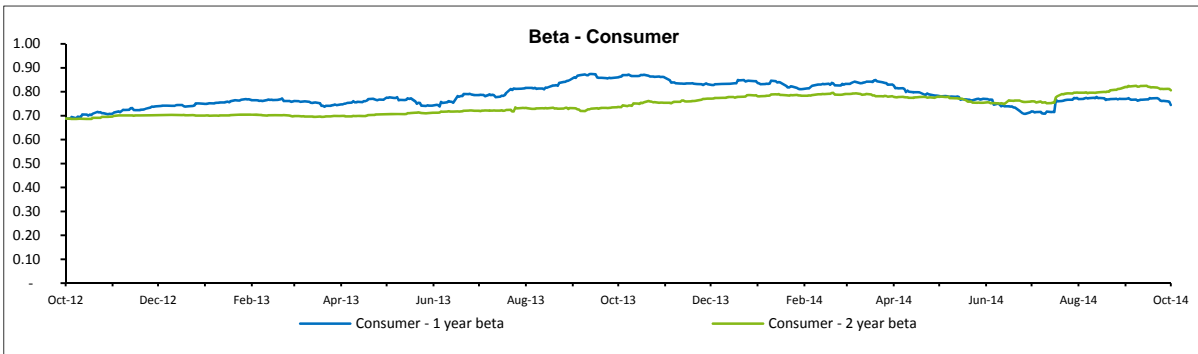


Fig. 38: CAPM Beta - Consumer

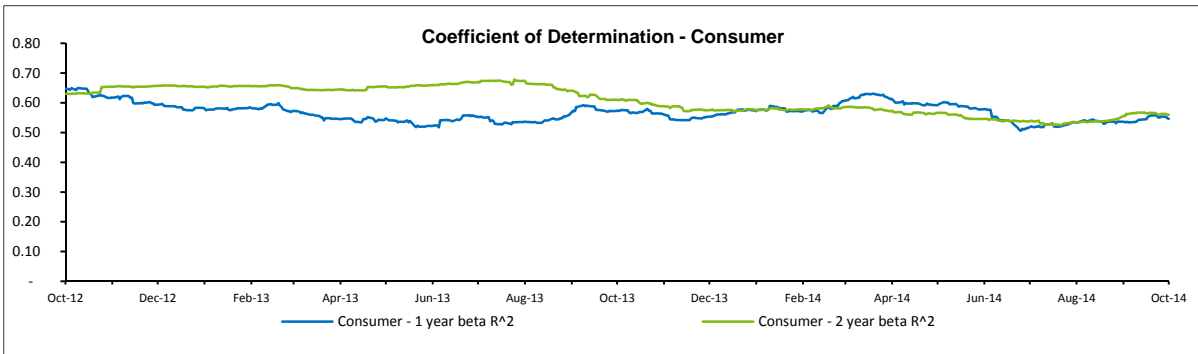


Fig. 39: CAPM R<sup>2</sup> - Consumer

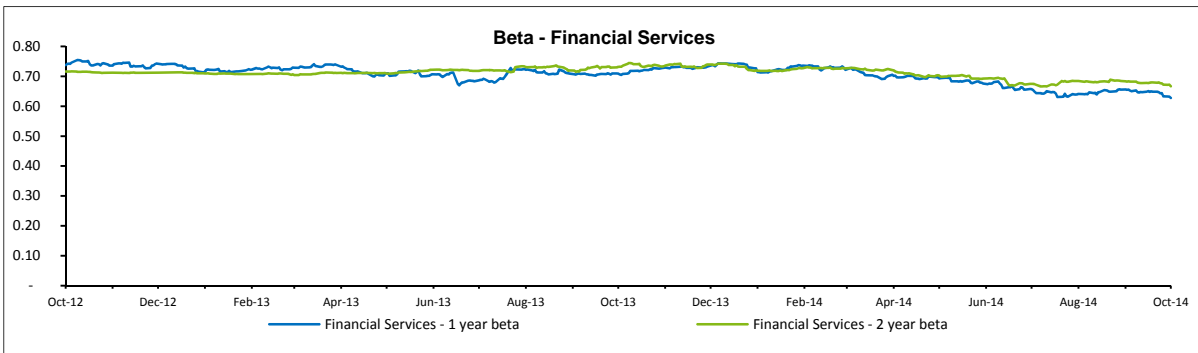


Fig. 40: CAPM Beta - Financial Services

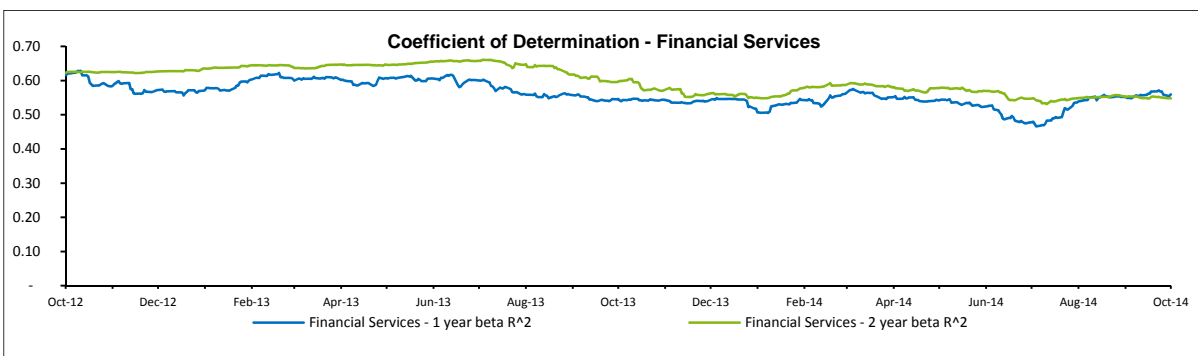


Fig. 41: CAPM R<sup>2</sup> - Financial Services

### Development of CAPM Beta Factors - Per Industry IV/IX

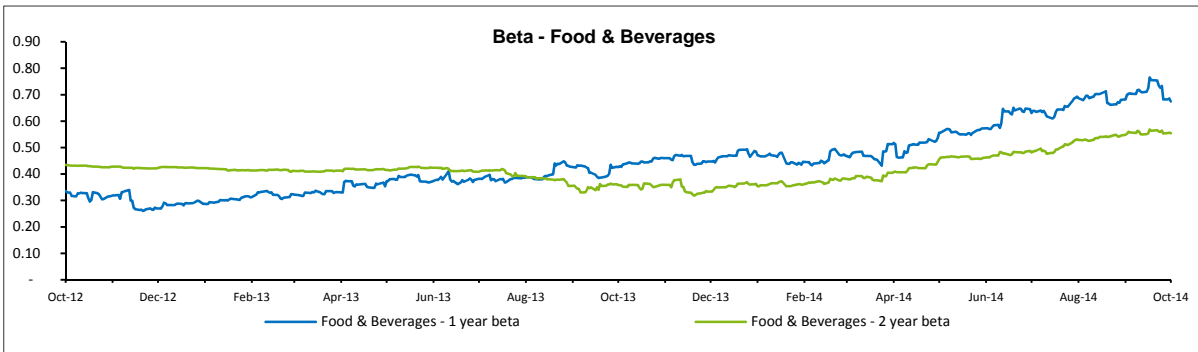


Fig. 42: CAPM Beta - Food & Beverages

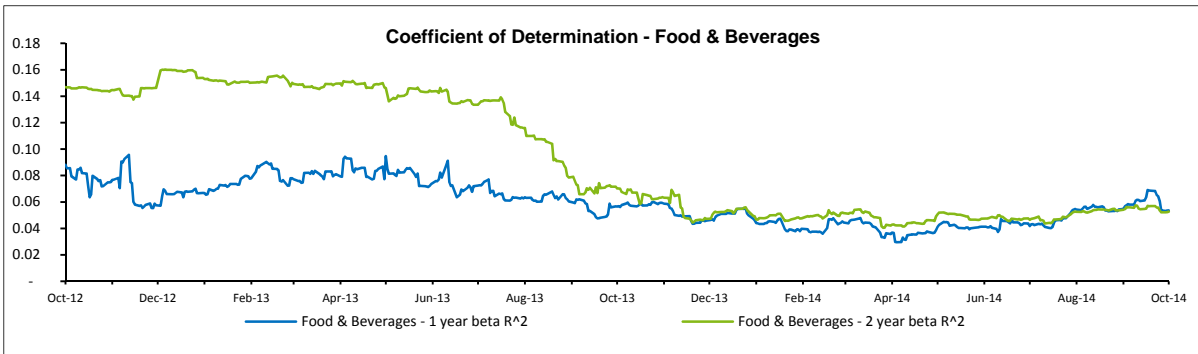


Fig. 43: CAPM R<sup>2</sup> - Food & Beverages

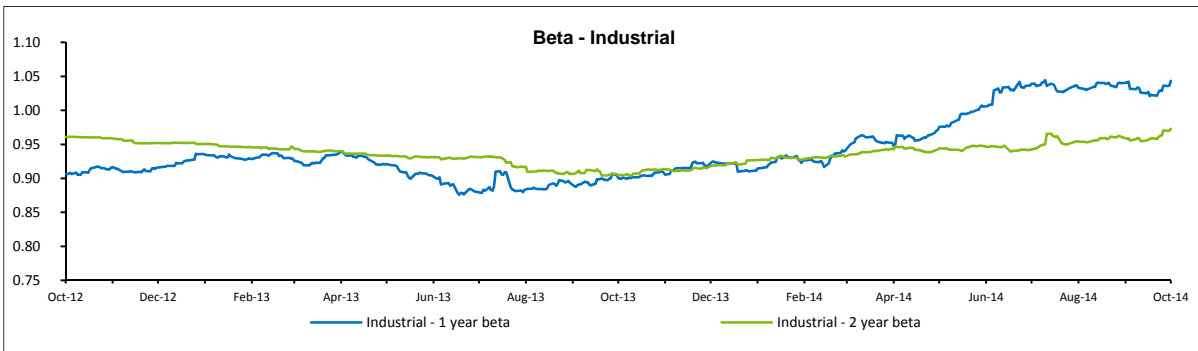


Fig. 44: CAPM Beta - Industrial

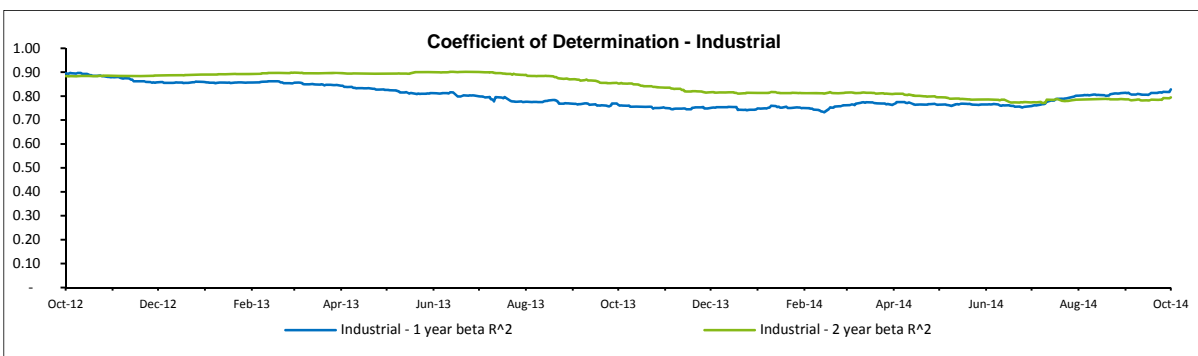


Fig. 45: CAPM R<sup>2</sup> - Industrial

### Development of CAPM Beta Factors - Per Industry V/IX

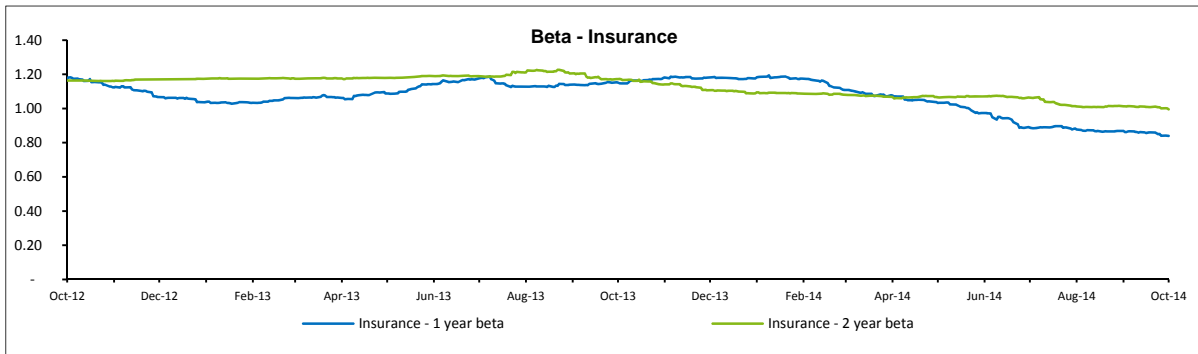


Fig. 46: CAPM Beta - Insurance

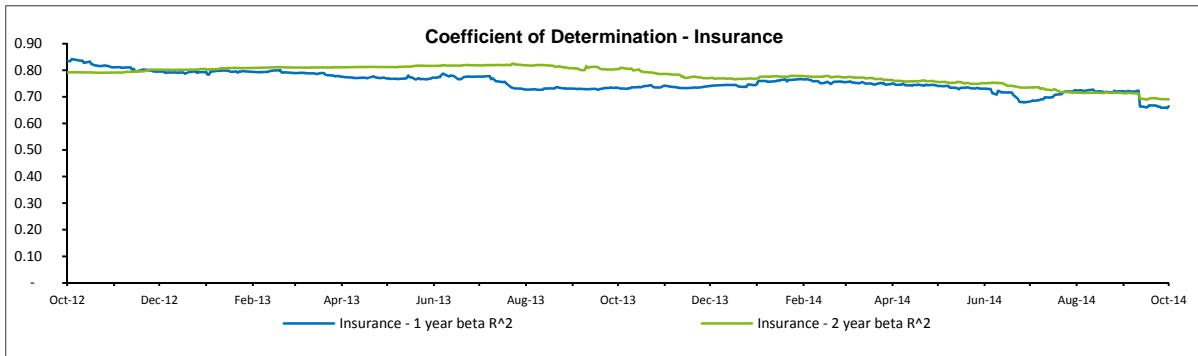


Fig. 47: CAPM R<sup>2</sup> - Insurance

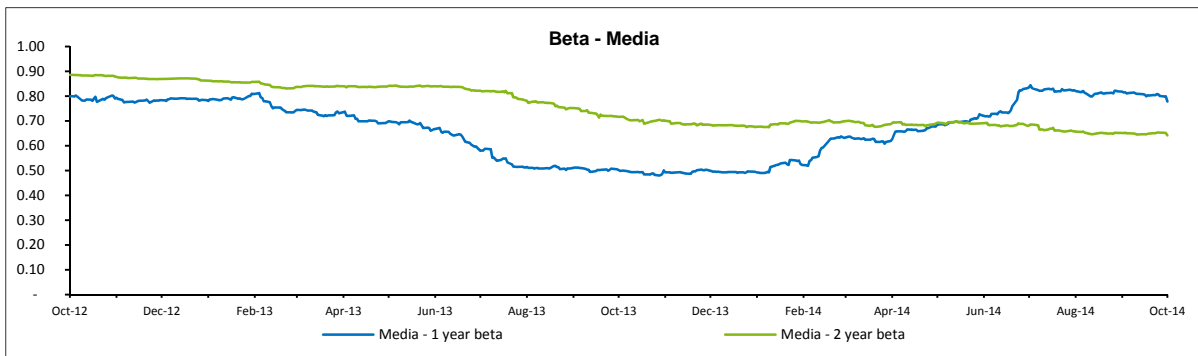


Fig. 48: CAPM Beta - Media

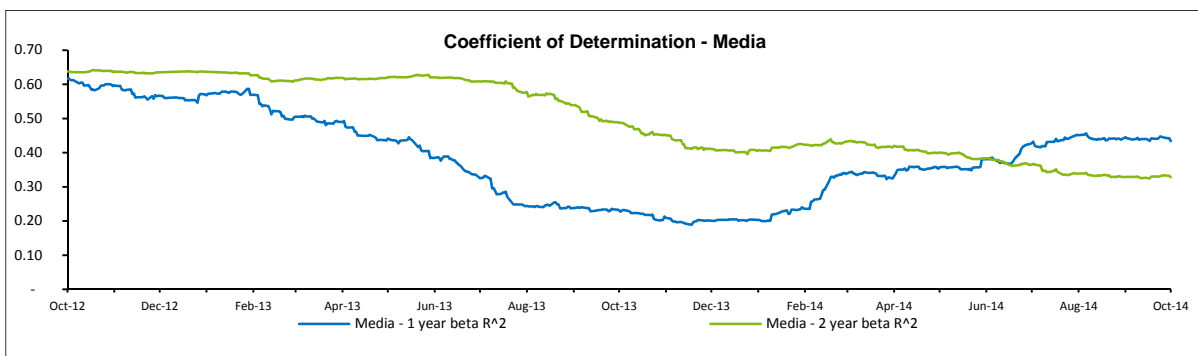


Fig. 49: CAPM R<sup>2</sup> - Media

### Development of CAPM Beta Factors - Per Industry VI/IX

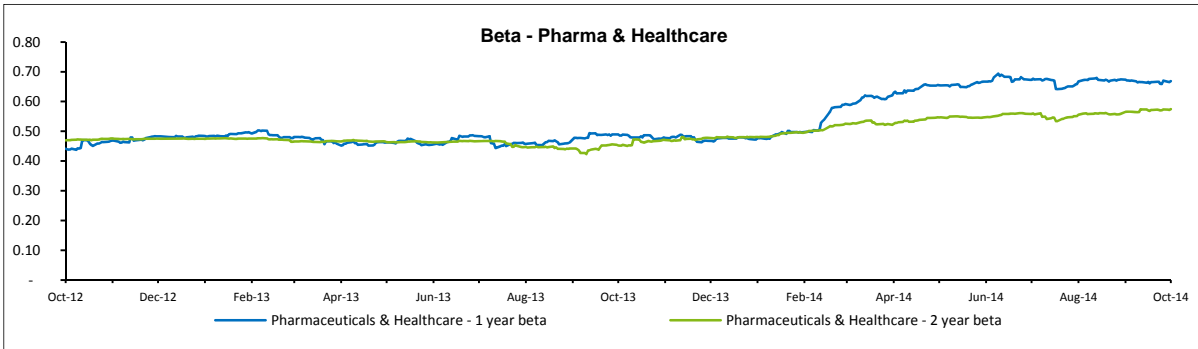


Fig. 50: CAPM Beta - Pharma & Healthcare

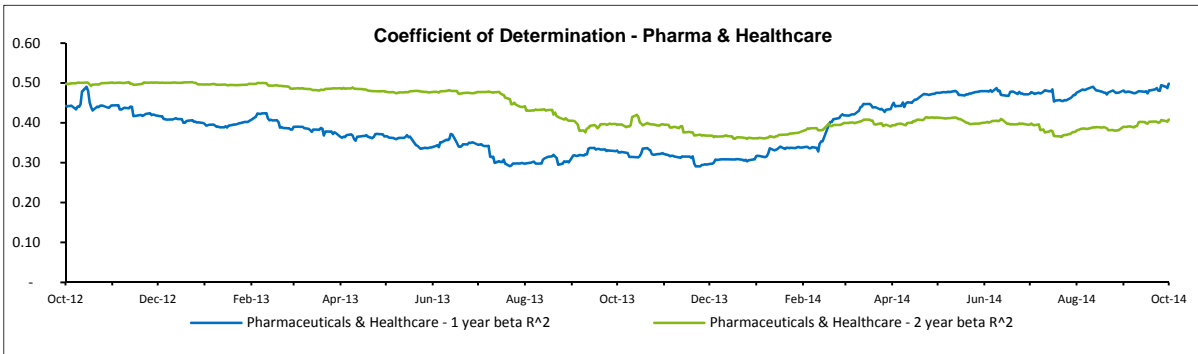


Fig. 51: CAPM R<sup>2</sup> - Pharma & Healthcare

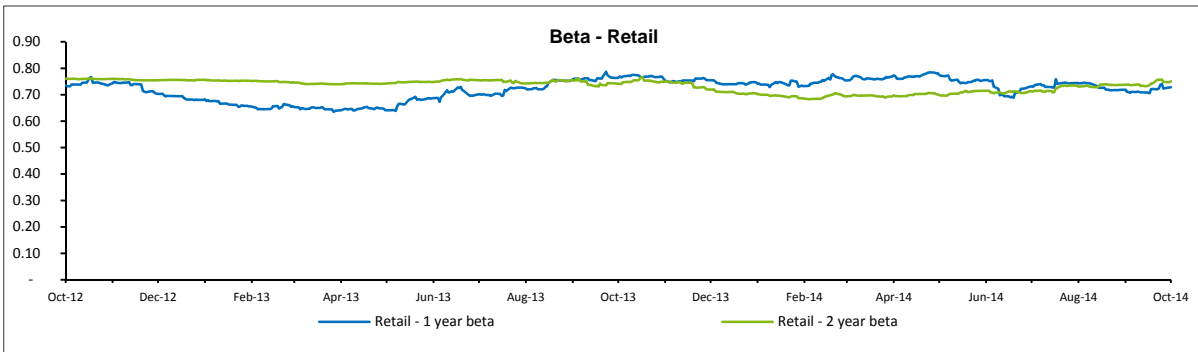


Fig. 52: CAPM Beta - Retail

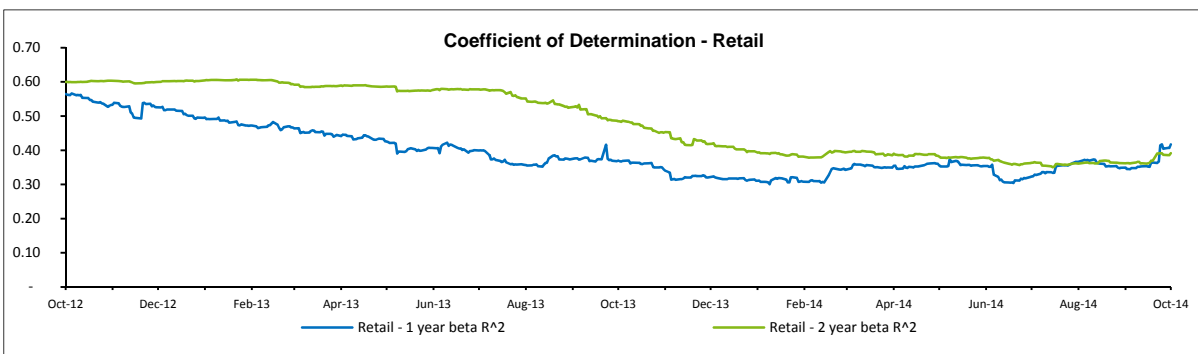


Fig. 53: CAPM R<sup>2</sup> - Retail

### Development of CAPM Beta Factors - Per Industry VII/IX

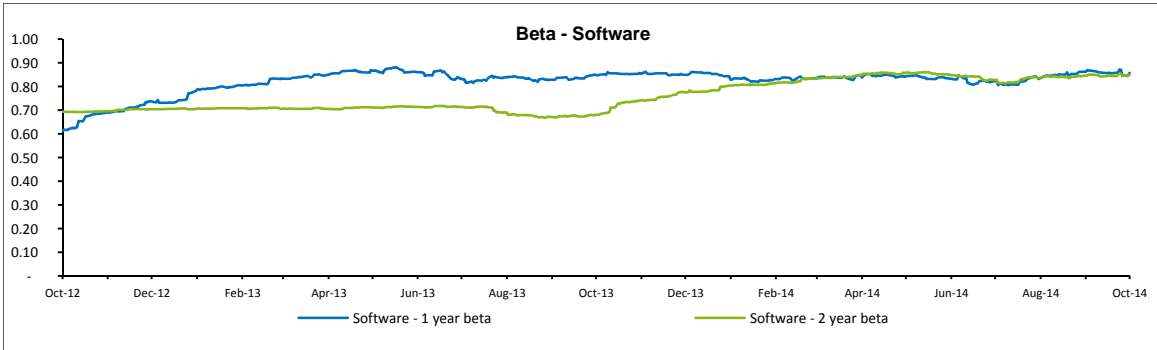


Fig. 54: CAPM Beta - Software

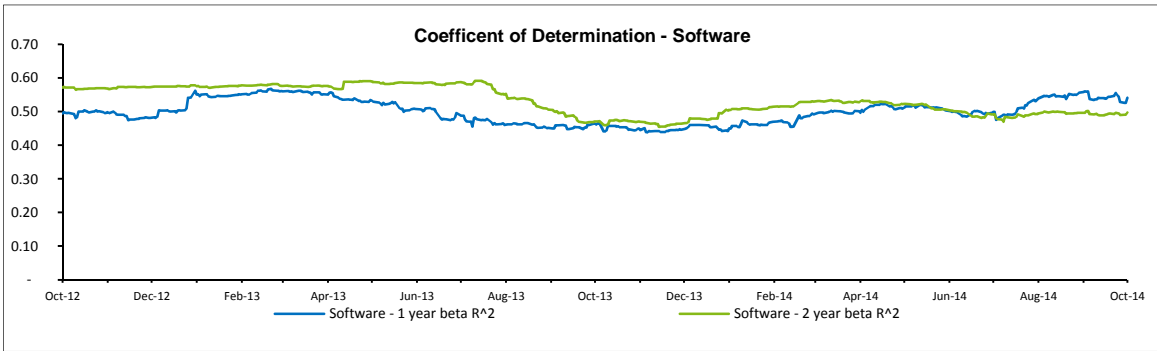


Fig. 55: CAPM R<sup>2</sup> - Software

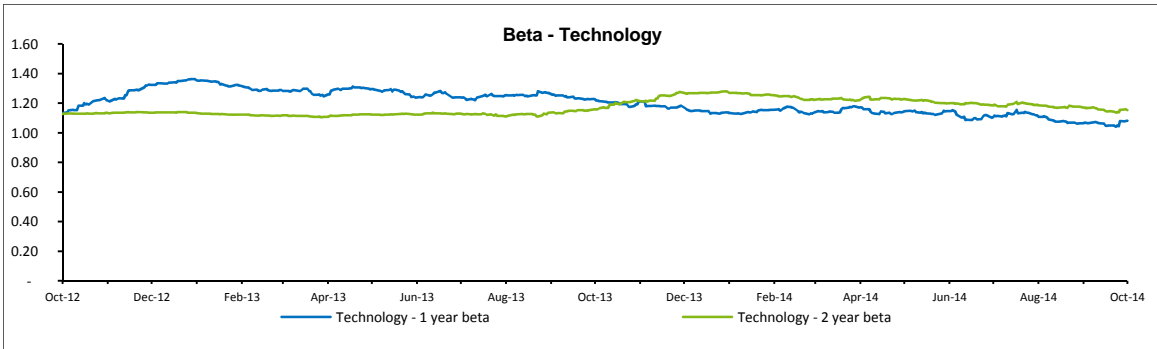


Fig. 56: CAPM Beta - Technology

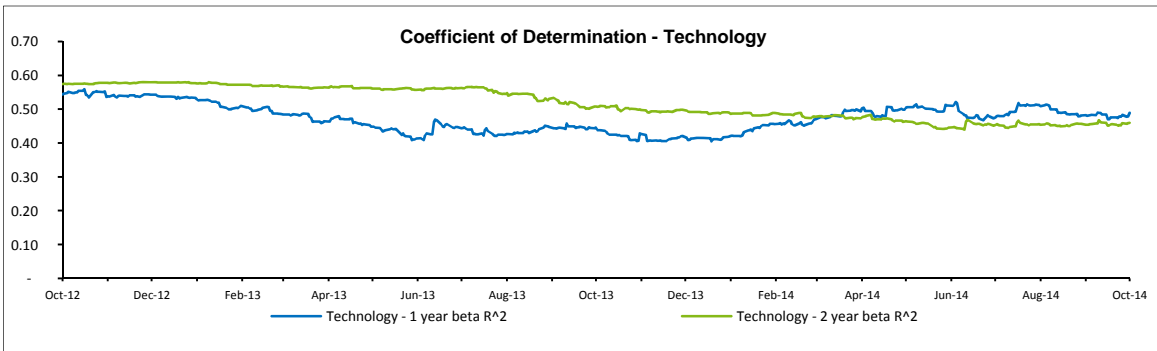


Fig. 57: CAPM R<sup>2</sup> - Technology

### Development of CAPM Beta Factors - Per Industry VIII/IX

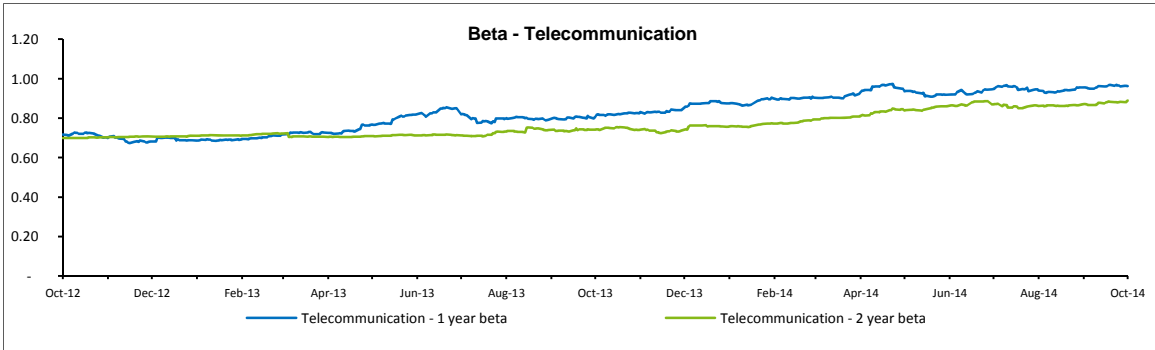


Fig. 58: CAPM Beta - Telecommunication

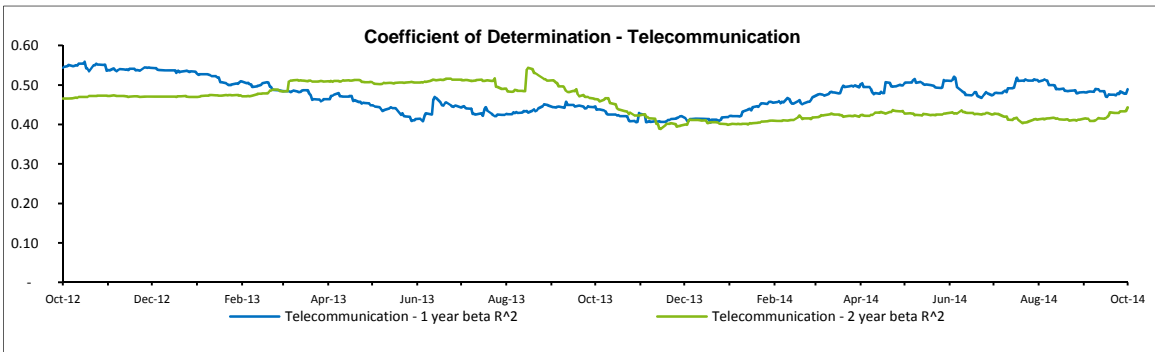


Fig. 59: CAPM R<sup>2</sup> - Telecommunication

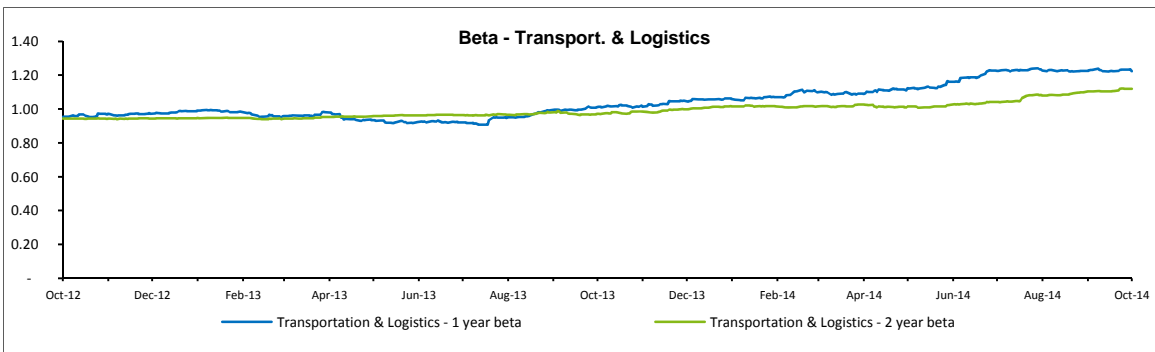


Fig. 60: CAPM Beta - Transport. & Logistics

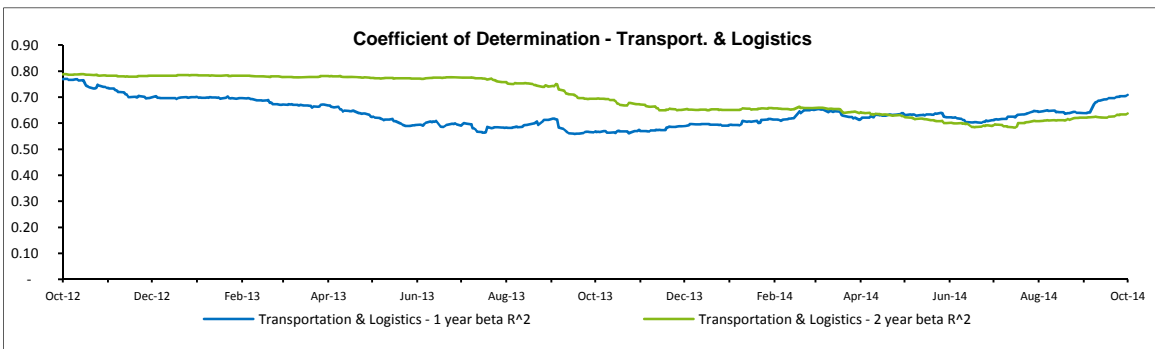


Fig. 61: CAPM R<sup>2</sup> - Transport. & Logistics

### Development of CAPM Beta Factors - Per Industry IX/IX

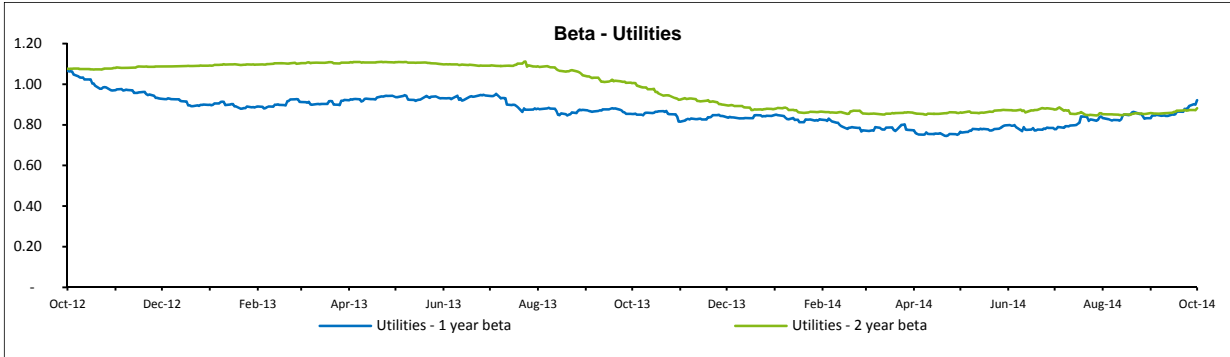


Fig. 62: CAPM Beta - Utilities

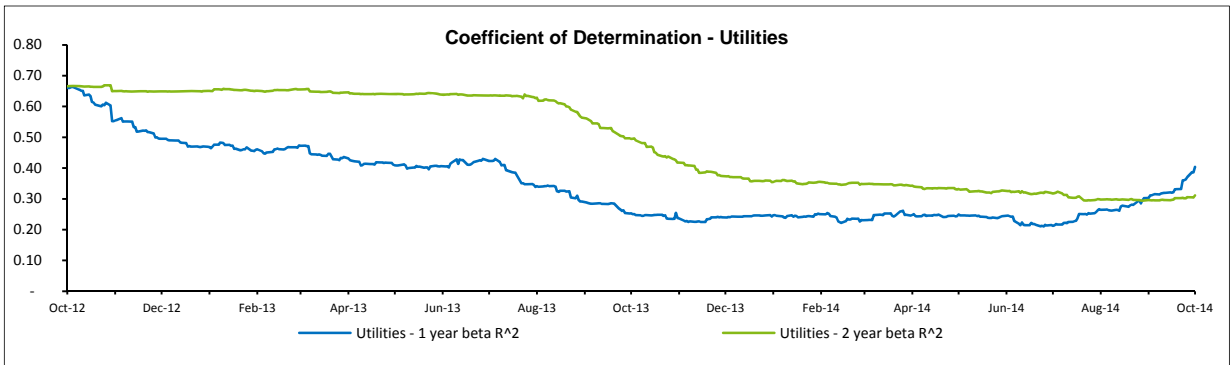


Fig. 63: CAPM R<sup>2</sup> - Utilities

## Yield Curve: Svensson (1994)

### Executive Summary

- Svensson approach is widely used to calculate yield curve
- Risk-free interest rates are negative for short maturities

For the valuation of a company, the risk-free rate plays an important role to calculate the cost of capital using the well known CAPM return equation. The cost of capital is used in the DCF framework for discounting the expected free cash flows. It is common knowledge that even small changes of the discount rate have a significant impact on the resulting firm and/or equity value. For quite a while the factors as the risk-free rate or the market risk premium have been very stable. That's why corporate valuation practice has put more weight on the correct estimation of the Beta factor of a company. Since the Euro-Crisis and its impact on the financial markets the risk-free rate displays a higher volatility, depending on the time point of estimation (see Figure 1). Slight changes in this risk-free rate strongly affect the present value of cash flows, particularly if the estimation is carried out for a long time horizon as in the terminal value calculus.

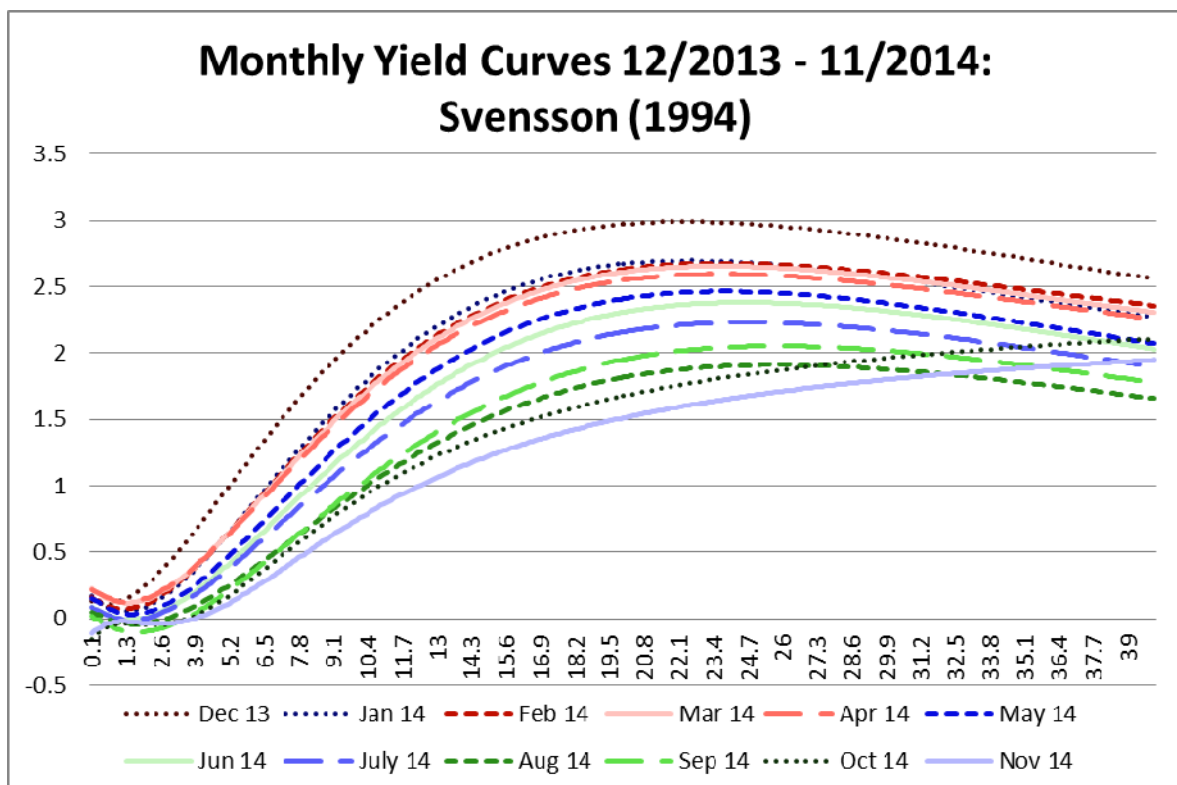


Figure 1



Determining a single risk-free rate for valuation purposes requires knowledge of the yield curve, which depicts the relation between the time to maturity and the interest rate of a bond without default risk. The continuously running yield curve has to be estimated as there is no bond for each maturity. In practice, the parametric approach by Svensson (1994) is widely used. The approach specifies the yield curve with exponential terms to avoid spikes caused by non-parametric methods. Thus, the estimates heavily depend on individual observations. The method by Svensson adds an additional term to increase the curve's flexibility, especially for explaining complex slopes in times of volatile markets.

In the last year the yield curve indicated negative risk-free rates for maturities of one to three years. This year negative rates for maturities up to four years were indicated (see Table 1).

Year	Dec 13	Jan 14	Feb 14	Mar 14	Apr 14	May 14	Jun 14	July 14	Aug 14	Sep 14	Oct 14	Nov 14
0,3	0,11905	0,13003	0,12836	0,19161	0,19054	0,12148	0,06064	0,05881	0,02710	-0,01044	-0,10606	-0,07508
1	0,12473	0,05986	0,07564	0,12537	0,13098	0,04828	0,00126	0,00090	-0,02744	-0,07970	-0,03768	-0,02263
2	0,24258	0,08198	0,10696	0,13968	0,14852	0,04410	0,00488	0,00075	-0,03730	-0,09913	-0,04445	-0,03361
3	0,44228	0,20426	0,22625	0,24474	0,25173	0,12576	0,08490	0,07228	0,01301	-0,04839	-0,03475	-0,03525
10	2,10828	1,73160	1,67055	1,64841	1,60919	1,41857	1,31259	1,21321	0,95158	0,99126	0,89051	0,74553

**Table 1**

As discussed in our capital market data report for 2013 negative risk-free interest rates undermine the theoretically correct valuation of a company, as the risk adjusted interest rate is calculated by adding the risk premium to the risk-free interest rate. The phenomenon of negative rates appeared again by June and disseminated from maturities between one and two years to all maturities up to almost four years by November.

As risk-free interest rates estimated by the method by Svensson are negative for increasing maturities it will be necessary to discuss alternative estimation methods. In this context, using average risk-free rates over more periods or long-term rates for all periods would be conceivable.

## Once Bitten, Twice Shy : How Unconsummated Deals Affect Subsequent M&As

by Peter Limbach, Johannes Reusche & Bernhard Schwetzler

### 1. Introduction

The literature on corporate investments, particularly mergers and acquisitions (M&As), intensively studies value creation (for excellent overviews, see Betton, Eckbo and Thorburn, 2008; Stein, 2003). Yet, it remains relatively silent about firms' abilities to assess and successfully consummate investment opportunities to ultimately create value as well as how firms deal with and learn from failure to consummate investments. Addressing these aspects, this study uses unconsummated M&As to study the costs and consequences of unrealized corporate investments. We assume that bidding firms put at stake their reputation when they act in the M&A market. As takeovers provide information about abilities to assess and consummate investments, firms have incentives to avoid problems in the M&A process and enhance their chance of successfully consummating a deal to protect their reputation. This should particularly be the case for firms that have already failed to consummate a takeover. Therefore, we argue that after having experienced unconsummated M&As, firms act more cautiously in subsequent takeover attempts in order to reduce the likelihood of problems and repeat failure to acquire. The study's results provide empirical support for the aforementioned hypotheses. Firms that experienced an unconsummated M&A exhibit

significantly lower and even negative abnormal announcement returns when failure to acquire repeats. Further, firms with failure experience act much more cautiously: they choose targets smaller than their typical target chosen before, are more likely to hire a financial advisor, hire more advisors, and more likely make cash bids. This "once bitten, twice shy" effect is in line with firms' reputational concerns and with anecdotal evidence. For example, The Economist recently notes: "[...] the thwarted acquirer may occasionally find it has dodged a bullet" (see "Mergers and acquisitions - Coming unstuck" on August 09, 2014). And about five years after Microsoft's failed bid for Yahoo, the New York Times wrote "The shadow of that failed bid lingered for years, and Microsoft never again tried a conquest of that magnitude" (see "Constant Acquisition at Microsoft, and One Deal That Didn't Close" on August 23, 2013). The study contributes to the limited literature about value capture and, particularly, learning in M&As. So far, existing studies (such as Fuller et al., 2002; Billett and Qian, 2008; and Aktas et al., 2013) have only examined successful transactions, thereby ignoring the effects of experiencing failure. The findings of this study suggest that failure, in the form of unconsummated takeovers, is an important experience for acquiring firms as it seems to have considerable impact on how acquirers structure their future M&A deals.

## 2. Data & Analysis

In line with the literature, repeat acquirers are defined as firms which engage in more than one acquisition in five years. The final data sample consists of more than 14,000 M&As announced by European and North American repeat acquirers between 1996 and 2011. For each of the acquisitions there is information available about each of the acquirer's previously consummated and unconsummated transactions, including the cumulative abnormal return (CAR) around the announcement date as well as specific deal and firm characteristics. We use this dataset to study the impact of failure experience, i.e., unconsummated M&A transactions (experienced as the bidding party) on subsequent acquisitions.

## 3. Results

We document the following results. First, after firms have experienced unconsummated takeovers (i.e., failure experience), they choose targets significantly smaller than their average or median target firm chosen before. Specifically, the likelihood of bidding for a target firm that is smaller than the five-year average (median) target firm is 14% (13%) higher if an unconsummated takeover directly precedes the focal deal. Supporting the lingering effect of failure experience as suggested by anecdotal evidence, we find that failures earlier in the acquirer's five-

year deal history increase the likelihood of choosing smaller targets by up to 11%. Results do not lose statistical significance (but some magnitude) when large unconsummated M&As ("blockbusters") are excluded. As larger targets are more difficult to assess and larger transactions are more likely to fail, this finding is in line with our reasoning. Second, we find that acquirers with deal failure experience are significantly more likely to employ a financial advisor (relative to conducting an in-house deal). Particularly, if a failed takeover directly precedes the focal deal, the likelihood of financial advisor employment is up to 6% higher. Firms also hire significantly more advisors, both in terms of the number of financial advisors and in terms of the number of all employed M&A advisors. These effects partly linger over time. They are consistent with firms hiring (more) outside expertise after deal failure and with incentives to "share the blame" in case deal problems or failure reoccur. They are also consistent with bidding firms that hire many advisors to keep them from advising target firms. Third, future M&As are more likely to be pure cash bids after bidders have experienced deal failure. This finding is in line with empirical evidence suggesting that stock bids are more difficult to structure and associated with more competing bids and higher deal failure ratios.

The results stand a battery of robustness tests used to address alternative explanations for the aforementioned findings. These tests include, for example, focusing on the treatment group of firms with M&A deal failure experience, using firm fixed effects and focusing on CEOs with deal failure experience. Other tests are performed as well; the results do not change. Similarly, when we consider subsamples by bidder origin, we find that our results are not considerably driven by a specific group of bidders. On the contrary, our findings are comparable among Anglo-Saxon, non-Anglo-Saxon as well as U.S. bidders. To be able to draw cleaner inferences about causality, we provide an identification strategy that is consistent with our reputation-based reasoning. Therefore, we use information about reasons for deal failure and exploit variation in the exogeneity of deal failure to the bidding firms' reputation for assessing and consummating M&As. In particular, we rerun our regressions with an additional

control for exogenous deal failure. Corroborating the idea that firms act more cautiously after deal failure in order to protect (or rebuild) their reputation, we find that the effect of failure experience gains magnitude when we capture exogenous deal failure with an additional control.

#### 4. Conclusions

Experiencing unconsummated M&A deals seems to influence firms' acquisition behavior. The study's findings suggest that firms act more carefully in M&As subsequent to failed takeovers. The careful behavior seems to linger of time and with CEOs. This result is likely to be the outcome of firms' (and managers') attempts to protect (or rebuild) their reputation for assessing and consummating investment opportunities. Consistently, the study finds that firms experience significantly lower (and negative) stock price reactions (as measured by CARs) if they repeatedly fail to consummate a takeover.

SSRN-Link: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2429375](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2429375)

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