



ACEPI - RESEARCH

Part 1: Bonus Certificates

Milan, 2017

Summary

- Research objectives
- Database description
 - Year of issue and maturities
 - Underlying and issuers
 - Barrier typologies
- Calculation of the historical performance
- Scatter-plot and Volatility
- Results and methodology
 - Return and risk
 - Performance and barrier hit
 - Dividend yield

Database description

The original database consists of **1116** certificates divided into 15 sub-types. These are certificates issued since 2004 and matured by 2015. The performance analysis will be conducted on the two main types for a total of **1008** certificates. Bonus Cap and Easy Express are aggregated

TYPOLOGY	NUMBER	PERCENTAGE
BONUS CAP	660	59,32%
BONUS	224	19,71%
EASY EXPRESS	124	11,33%
TOP BONUS	83	7,40%
SPEEDY BONUS	6	0,54%
BONUS PLUS	5	0,45%
PROTECT BONUS	5	0,45%
BONUS EXPRESS CAP	1	0,09%

TYPOLOGY	NUMBER	PERCENTAGE
BONUS CLIQUET	1	0,09%
PROTECTION CON BONUS	1	0,09%
RECOVERY BONUS CAP	1	0,09%
TWIN WIN BONUS	1	0,09%
BONUS CAP PRO	1	0,09%
BONUS PRO	1	0,09%
BONUS QUANTO	1	0,09%
CP 90 BONUS	1	0,09%

Certificate selection and methodology

- The analysis will focus primarily on the entire database, then the focus will move to the two most important certificates: Bonus and Bonus Cap
- The analysis will estimate the historical performance of the certificates in comparison with the underlying's one in the same reference period. This allows the comparison of the performance of investment certificates with the hypothetical direct investment in the underlying
- The analysis will be carried out by dividing the sample into three sub-periods corresponding to different market phases: certificates issued from 2004 to 2007, those from 2008 to 2009 and then from 2010 to 2015
- The calculation of the performance will be made firstly without considering the effect of dividends and then considering their impact

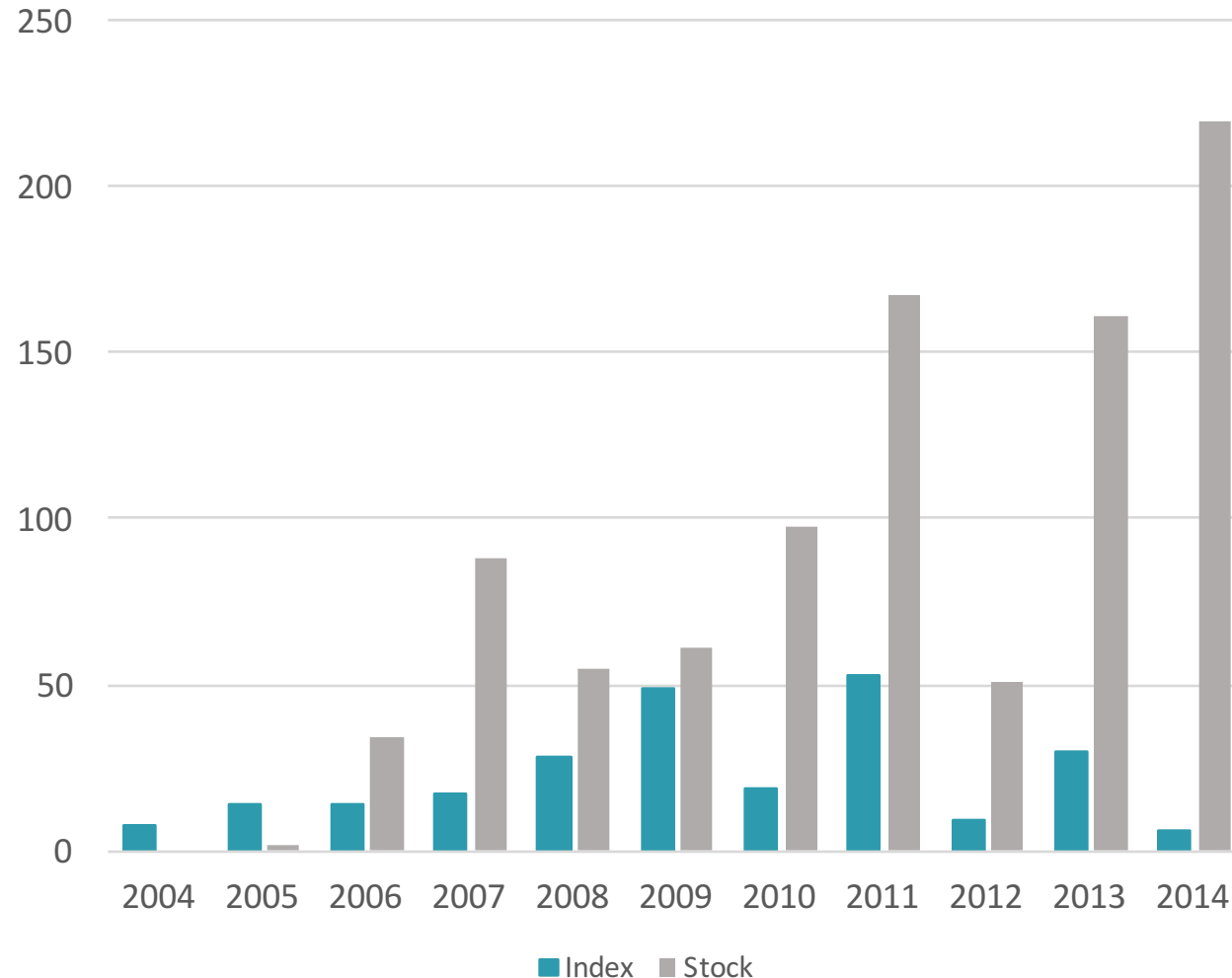
Features of the certificates: year of issue and life-cycle

The largest number of certificates (201 or 20%) of the database have been issued in 2014. The certificates issued in the early years had usually maturities greater than 24 months while those issued in the last period have shorter maturities

YEAR OF ISSUE	LIFECYCLE				TOTAL
	LESS THAN 6 MONTHS	6-11 MONTHS	12-23 MONTHS	MORE THAN 24 MONTHS	
2004				8	8
2005				15	15
2006				43	43
2007			43	47	90
2008		1	29	39	69
2009		9	49	43	101
2010		15	81	14	110
2011	16	57	115	13	201
2012	18	13	1	19	51
2013	1	46	112	15	174
2014	12	87	47		146
TOTAL	47	228	477	256	1008
PERCENTAGE	5%	23%	47%	25%	

Features of the certificates: underlying

The certificates have 141 different underlyings (112 stocks and 26 indices)



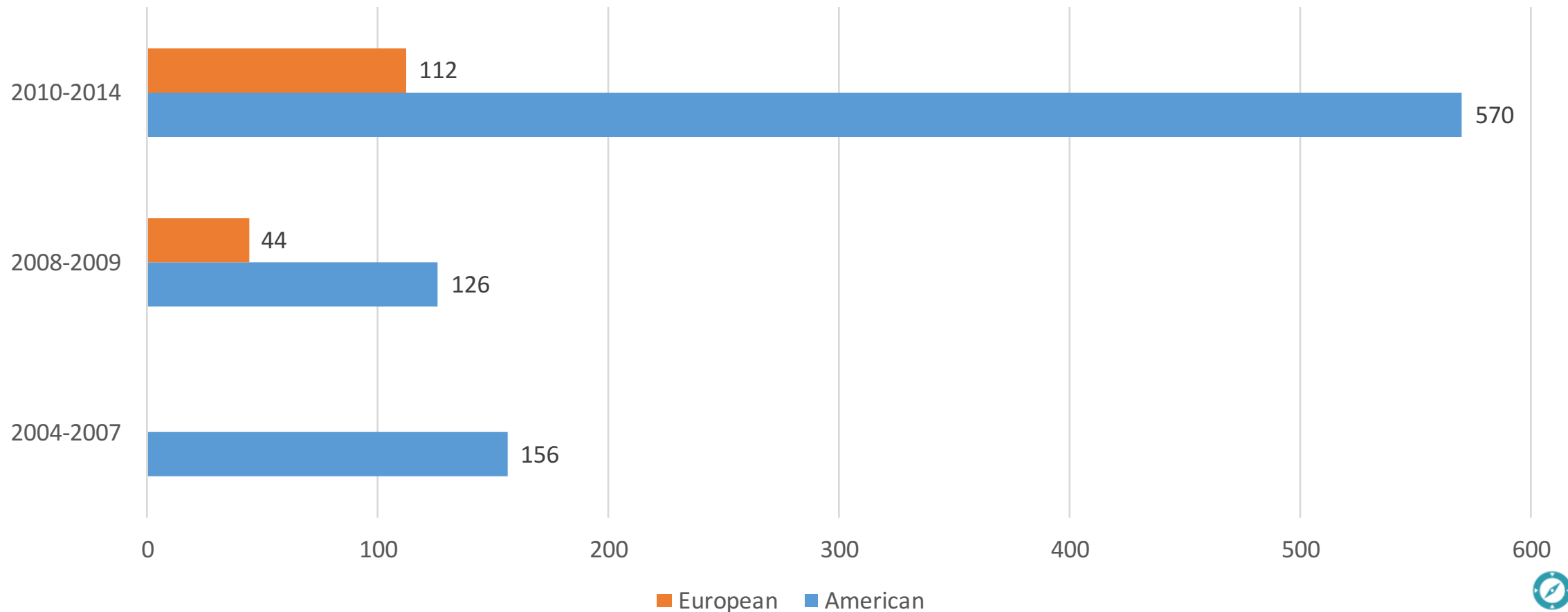
248 certificates have stocks as underlying. The rest 916 have instead indices

The most traded underlyings have been:

- S&P 500 (8,19%)
- Intesa San Paolo (7,85%)
- FTSE MIB (6,59%)
- Unicredit (6,25%)
- Telecom Italia (6,00%)

Features of the certificates: barrier typology

Considering the different sub periods, the distribution of the different barrier types is the following



Calculation of historical performances

- For each certificate, the performance has been calculated by comparing the performance of the redemption price with the issue price
- In case of certificates that have not touched the barrier, it has been considered the redemption value at the redemption date of the certificate. The calculated yield is thus the investor's return holding the certificate until maturity
- In case of certificates that have touched the barrier, it was considered the redemption value at maturity date of the certificate
- It has been then calculated the average yield of certificates belonging to the two categories: Bonus and Bonus Cap
- Alpha is the variable that expresses the difference between the average yield of certificates and the average yield of the underlying

Final database

The period was divided into three sections:

2004-2007: bull market, 156 certificates have been considered

2008-2009: bear market, 170 certificates have been considered

2010-2015: bullish US market and lateral EU market, 682 certificates have been considered

It has not been taken into consideration the maturity date but only the issue date

PERIOD	BONUS	BONUS CAP	TOTAL
2004-2007	155	1	156
2008-2009	58	112	170
2010-2014	11	671	682
TOTAL	224	784	1008

Yields and risk

2004-2007

It has been compared the average performance of the underlying and certificates in the period 2004-2007 for a total of 156 observations

The average yield of certificates is higher than the average yield of the underlying in the Bonus certificates

Bonus Cap have not been considered since there was only one observation and should not be considered significant

TPOLOGY	PERCENTAGE	AVERAGE BARRIER AND BONUS	UNDERLYING AVERAGE YIELD	CERTIFICATES AVERAGE YIELD	AVERAGE ALPHA
BONUS	99%	74% / 119%	-40,68%	-39,84%	0,83%

TPOLOGY	MAX/MIN BARRIER	MAX UNDERLYING YIELD	MAX CERTIFICATES YIELD	MIN UNDERLYING YIELD	MIN CERTIFICATES YIELD
BONUS	50% / 92%	66,64%	60,85%	-85,35%	-85,35%

Yields and risk

2008-2009

In the second period, 170 observations have been considered. The Alpha of certificates is always greater than the yield of the underlying

During these years the market has been basically bearish and barrier protected in most cases the capital invested

TPOLOGY	PERCENTAGE	AVERAGE BARRIER AND BONUS	UNDERLYING AVERAGE YIELD	CERTIFICATES AVERAGE YIELD	AVERAGE ALPHA
BONUS	34%	66% / 126%	-24,08%	-13,06%	11,02%
BONUS CAP	66%	65% / 118%	-3,41%	5,09%	8,51%

TPOLOGY	MAX/MIN BARRIER	MAX UNDERLYING YIELD	MAX CERTIFICATES YIELD	MIN UNDERLYING YIELD	MIN CERTIFICATES YIELD
BONUS	50% / 80%	27,16%	43,53%	-78,63%	-78,63%
BONUS CAP	50% / 70%	89,33%	53,50%	-75,84%	-75,84%

Yields and risk

2010-2014

In the third period, 682 observations have been considered in a bullish market condition. Due to the presence of the cap in cap bonuses, the certificates' return is lower than the underlying's one, however the performance of the instrument is anyway positive.

TYPOLOGY	PERCENTAGE	AVERAGE BARRIER AND BONUS	UNDERLYING AVERAGE YIELD	CERTIFICATES AVERAGE YIELD	AVERAGE ALPHA
BONUS	2%	70% / 120%	16,22%	20,58%	4,37%
BONUS CAP	98%	72% / 113%	5,11%	2,03%	-3,08%

TYPOLOGY	MAX/MIN BARRIER	MAX UNDERLYING YIELD	MAX CERTIFICATES YIELD	MIN UNDERLYING YIELD	MIN CERTIFICATES YIELD
BONUS	60% / 86%	39,92%	40,00%	-50,01%	-50,01%
BONUS CAP	50% / 97%	96,72%	52,51%	-93,17%	-93,17%

Underlying performance

The average performance of the underlying has been compared to the average yield of certificates in 4 different performance scenarios of the underlying (X). The value in the brackets represents the percentage of the total certificates which had an underlying's performance in that range

X < -20% (35%)	UNDERLYING PER.	CERTIFICATES PER.	ALPHA	ALPHA ADJ.
BONUS (45%)	-48,49%	-46,54%	1,95%	-1,52%
BONUS CAP (55%)	-37,28%	-30,52%	6,76%	3,39%

-20% < X < 0% (20%)	UNDERLYING PER.	CERTIFICATES PER.	ALPHA	ALPHA ADJ.
BONUS (16%)	-9,98%	-0,25%	9,72%	5,38%
BONUS CAP (84%)	-10,00%	7,38%	17,37%	13,56%

0% < X < 10% (11%)	UNDERLYING PER.	CERTIFICATES PER.	ALPHA	ALPHA ADJ.
BONUS (14%)	3,97%	14,94%	10,96%	5,79%
BONUS CAP (86%)	5,33%	12,44%	7,11%	3,27%

10% < X < 20% (9%)	UNDERLYING PER.	CERTIFICATES PER.	ALPHA	ALPHA ADJ.
BONUS (7%)	16,54%	16,63%	0,08%	-3,66%
BONUS CAP (93%)	14,74%	13,47%	-1,27%	-4,91%

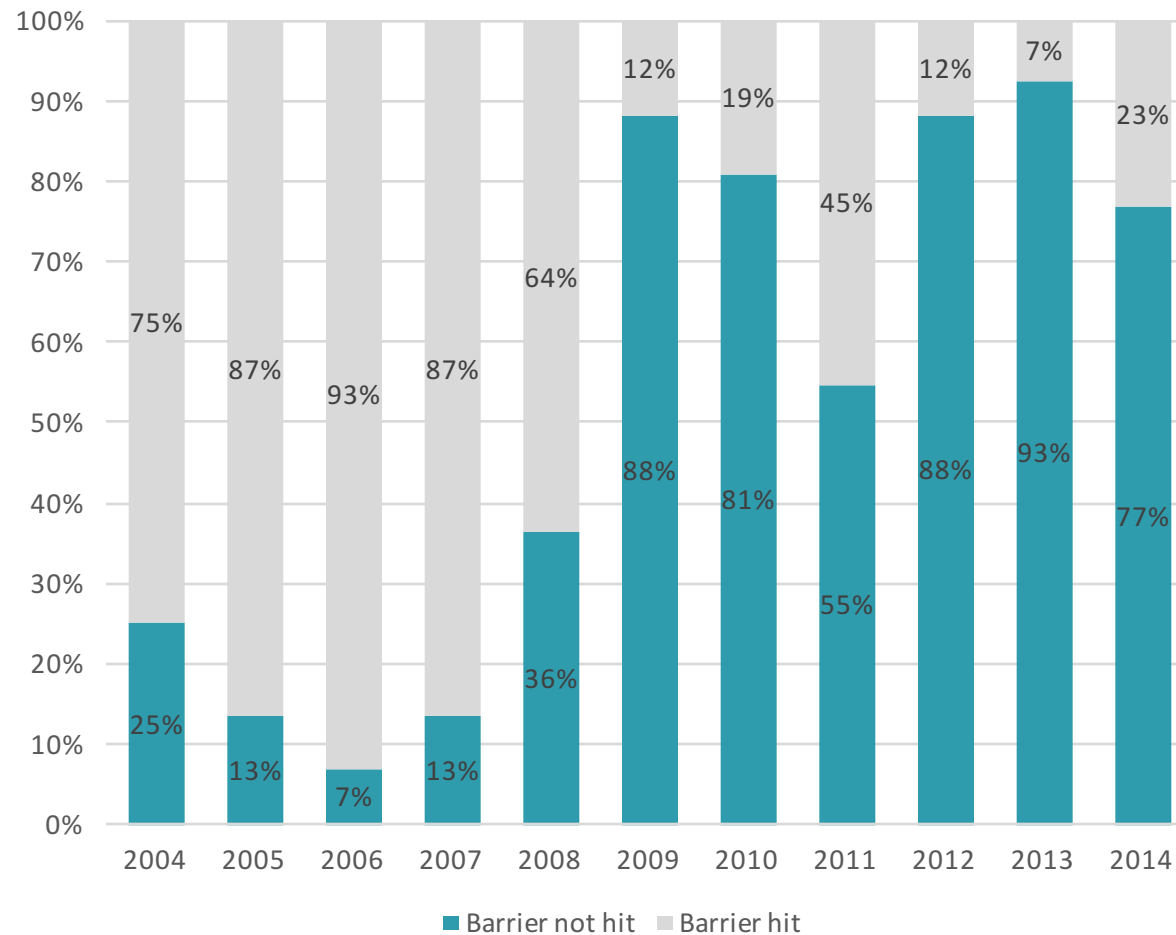
- Certificates' yield is similar to the underlyngs' one
- The barrier protected the capital invested in some certificates (Alpha > 0)

- Positive Alpha in lateral market conditions

- Lower return in case of bull market (due to Cap)

Barrier position

To get a better understanding of the results, the returns have been analyzed in comparison to the barrier hit



Until 2008, the certificates which haven't touched the barrier have been 38%

From 2009, this value reached 78%

Most of the barrier have been reached in 2006-2008 due to the high volatility

Barrier and determinants

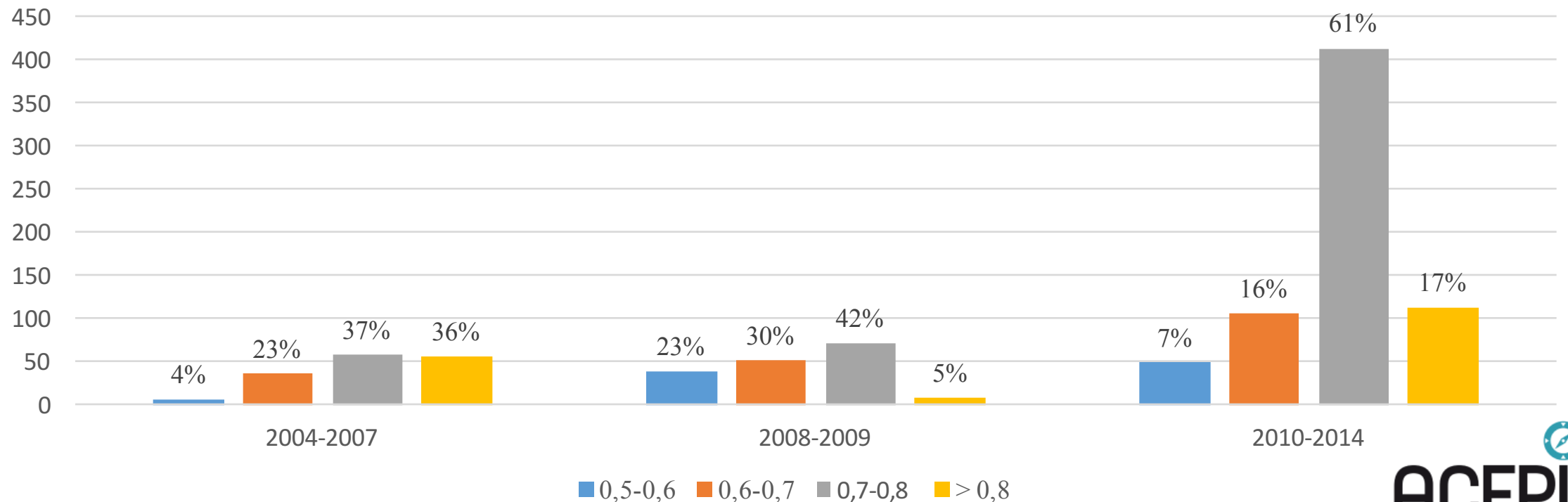
The reason why a certificate does not touch the barrier can be explained by:

- Market conditions
- Barrier typology
- Barrier positioning, seen as the relationship between barrier level and strike

Barrier and determinants: positioning

Considering all the observations, the barrier levels are the following

PERIOD	BARRIER POSITIONING VS. STRIKE			
	0,5-0,6	0,6-0,7	0,7-0,8	> 0,8
2004-2007	4%	23%	37%	36%
2008-2009	23%	30%	42%	5%
2010-2014	7%	16%	61%	17%



Bonus vs. Barrier

Dividing the observations into sub periods, the average level of the bonus has been calculated

PERIOD	BARRIER POSITIONING VS. STRIKE			
	0,5-0,6	0,6-0,7	0,7-0,8	> 0,8
2004-2007	112%	117%	122%	119%
2008-2009	122%	118%	123%	119%
2010-2014	114%	115%	113%	114%
TOTALE	117%	116%	115%	116%

The greatest bonus levels are in certificates issued in 2008-2010 with a barrier between 70% and 80%

Bonus vs. Barrier

Dividing the observations into sub periods, the average level of the bonus has been calculated

BONUS	BARRIER POSITIONING VS. STRIKE			
	0,5-0,6	0,6-0,7	0,7-0,8	> 0,8
2004-2007	112%	117%	122%	119%
2008-2009	122%	121%	132%	121%
2010-2014		131%	114%	110%
TOTAL	119%	119%	124%	119%

BONUS CAP	BARRIER POSITIONING VS. STRIKE			
	0,5-0,6	0,6-0,7	0,7-0,8	> 0,8
2004-2007		128%		
2008-2009	122%	117%	117%	118%
2010-2014	114%	114%	113%	114%
TOTAL	117%	115%	113%	114%

Cap positioning

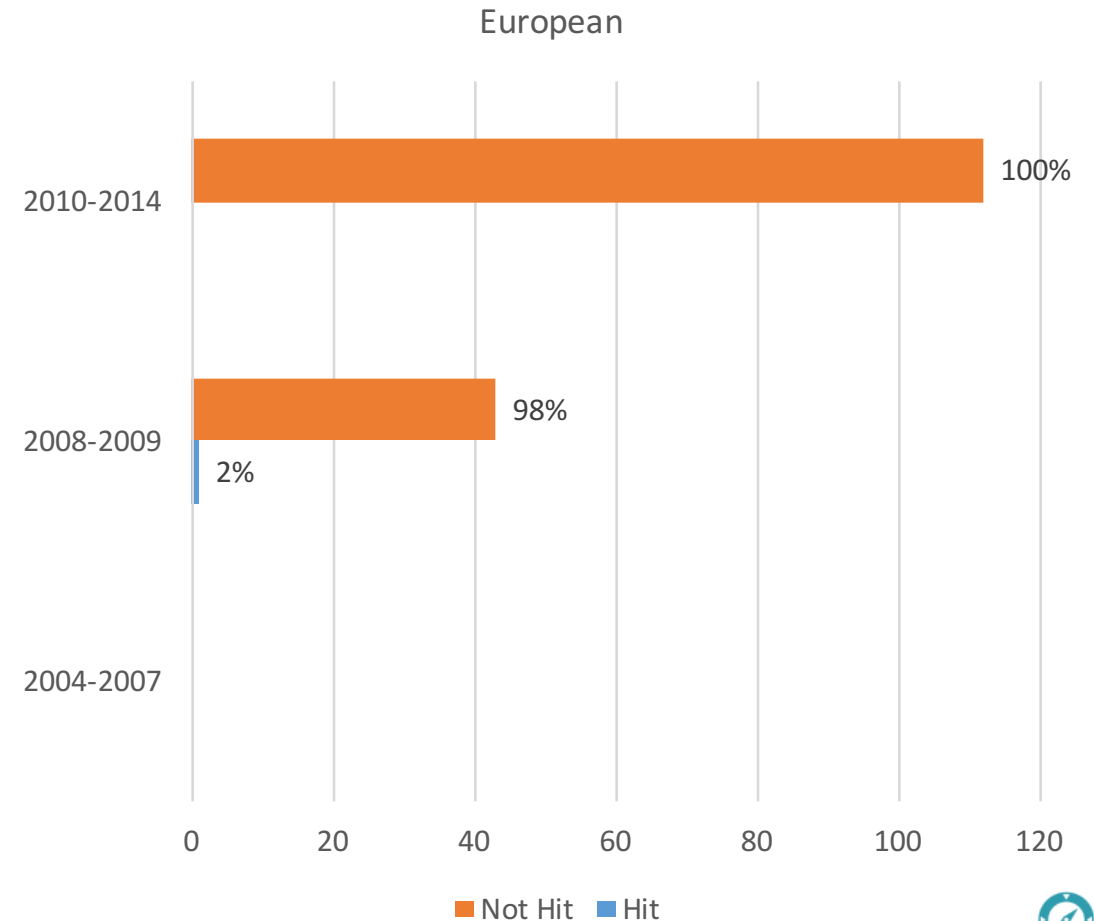
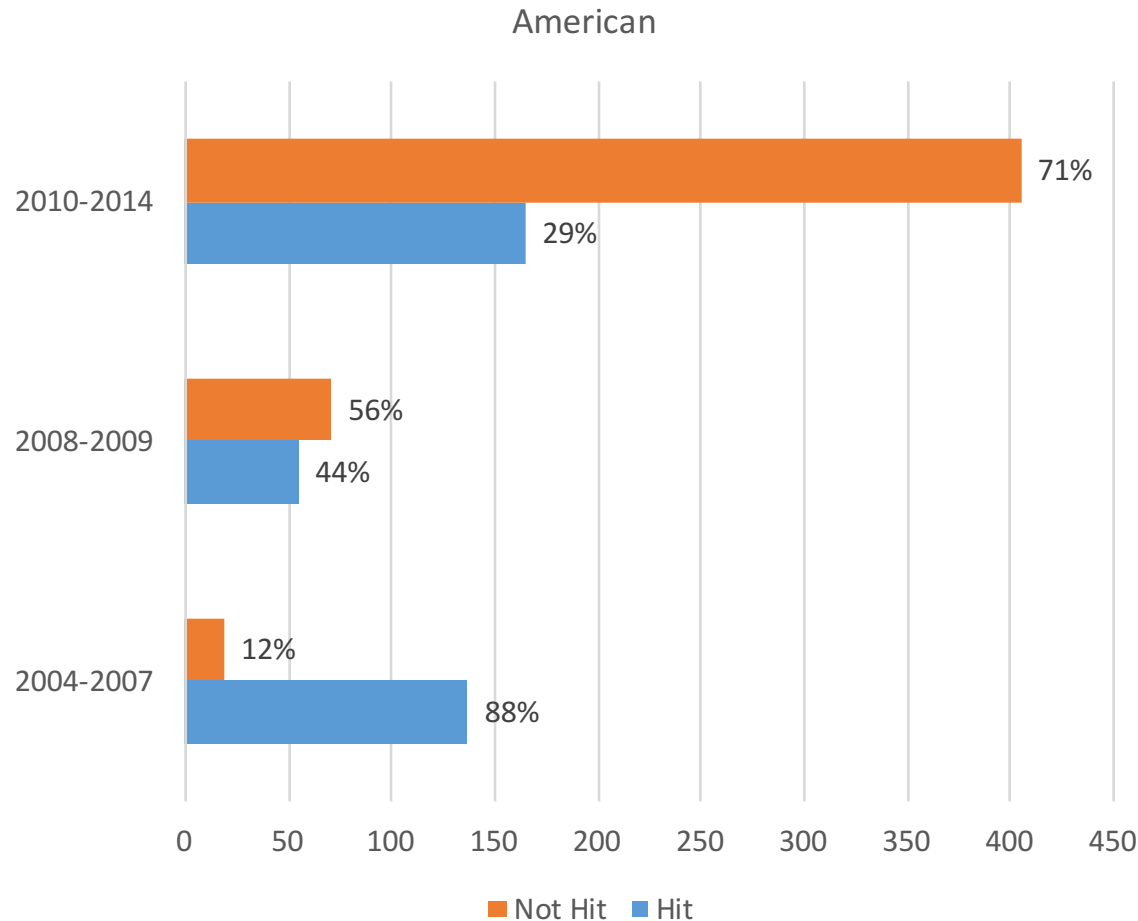
784 Bonus Cap have been considered and the different levels of cap have been observed. The result can be summarized as the following:

BONUS CAP	OBSERVATIONS	PERCENTAGE
0% - 10%	224	10%
10% - 20%	370	29%
20% - 30%	114	47%
> 30%	76	15%

The majority of certificates have a cap between 20% and 30%, this is a positive result for the investors

Barrier and determinants: typology

The barrier hit event can be also analyzed according to its typology



Barrier and performance

	BARRIER LEVEL	PERCENTAGE ON TOTAL	UNDERLYING PERFORMANCE	CERTIFICATES PERFORMANCE	ALPHA
BONUS	0,5-0,6	2%	-27,57%	-8,97%	18,60%
	0,6-0,7	5%	-34,40%	-29,41%	4,99%
	0,7-0,8	9%	-30,67%	-28,71%	1,95%
	> 0,8	6%	-39,12%	-38,91%	0,22%
BONUS CAP	0,5-0,6	7%	-3,54%	4,10%	7,64%
	0,6-0,7	14%	7,51%	8,12%	0,61%
	0,7-0,8	45%	5,73%	0,77%	-4,96%
	> 0,8	12%	-2,76%	1,35%	4,11%

Barrier hit and performance 2004-2007

In the table below, the analysis has been conducted separately on certificates that have/haven't hit the barrier

- The certificates which hit the barrier have a performance similar to the underlying's one
- The certificates which haven't hit the barrier have a greater alpha

TYPOLOGY		PERCENTAGE	UNDERLYING AVERAGE YIELD	CERTIFICATES AVERAGE YIELD	AVERAGE ALPHA
BONUS	Barrier not hit	19 (12%)	-6,16%	0,06%	6,22%
	Barrier hit	136 (88%)	-45,50%	-45,50%	0,00%

Barrier hit and performance 2008-2009

Also in the second period, the certificates that have reached the barrier (worst-case scenario for investors) have obtained a return in line with the underlying
The certificates that have not broken that level have achieved a very positive performance for the investors

TYPOLOGY		PERCENTAGE	UNDERLYING AVERAGE YIELD	CERTIFICATES AVERAGE YIELD	AVERAGE ALPHA
BONUS	Barrier not hit	21 (12%)	-3,65%	26,65%	30,30%
	Barrier hit	37 (22%)	-35,67%	-35,67%	0,00%
BONUS CAP	Barrier not hit	93 (55%)	1,77%	12,01%	10,24%
	Barrier hit	19 (11%)	-28,76%	-28,76%	0,00%

Barrier hit and performance 2010-2014

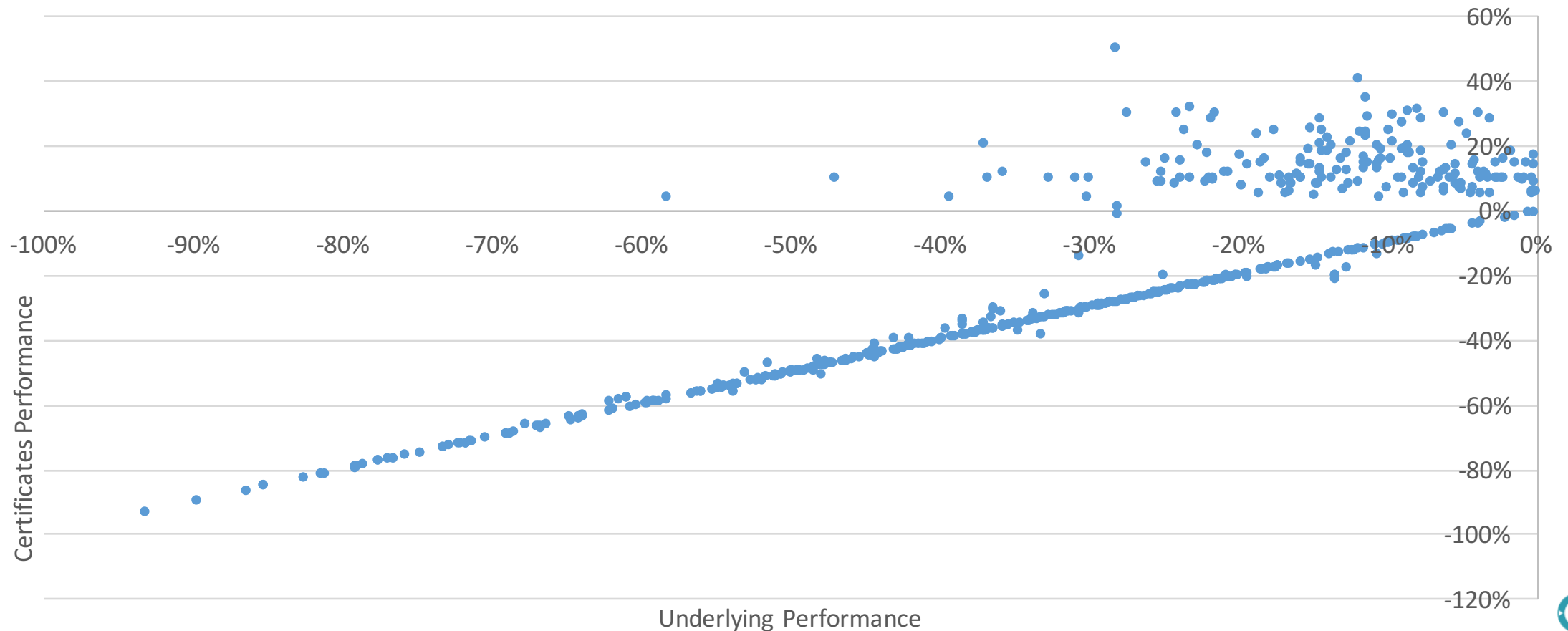
In the last period the situation is in a slightly different because it has been touched a small number of barriers due to a bullish market condition:

- Bonus have always positive an alpha, yet they account for only 2% of the sample
- Bonus Cap, by limiting the maximum level of performance, have a negative alpha

TYPOLOGY		PERCENTAGE	UNDERLYING AVERAGE YIELD	CERTIFICATES AVERAGE YIELD	AVERAGE ALPHA
BONUS	Barrier not hit	9 (1%)	23,81%	29,15%	5,34%
	Barrier hit	2 (1%)	-17,95%	-17,95%	0,00%
BONUS CAP	Barrier not hit	508 (74%)	14,99%	11,38%	-3,61%
	Barrier hit	163 (24%)	-25,71%	-25,71%	0,00%

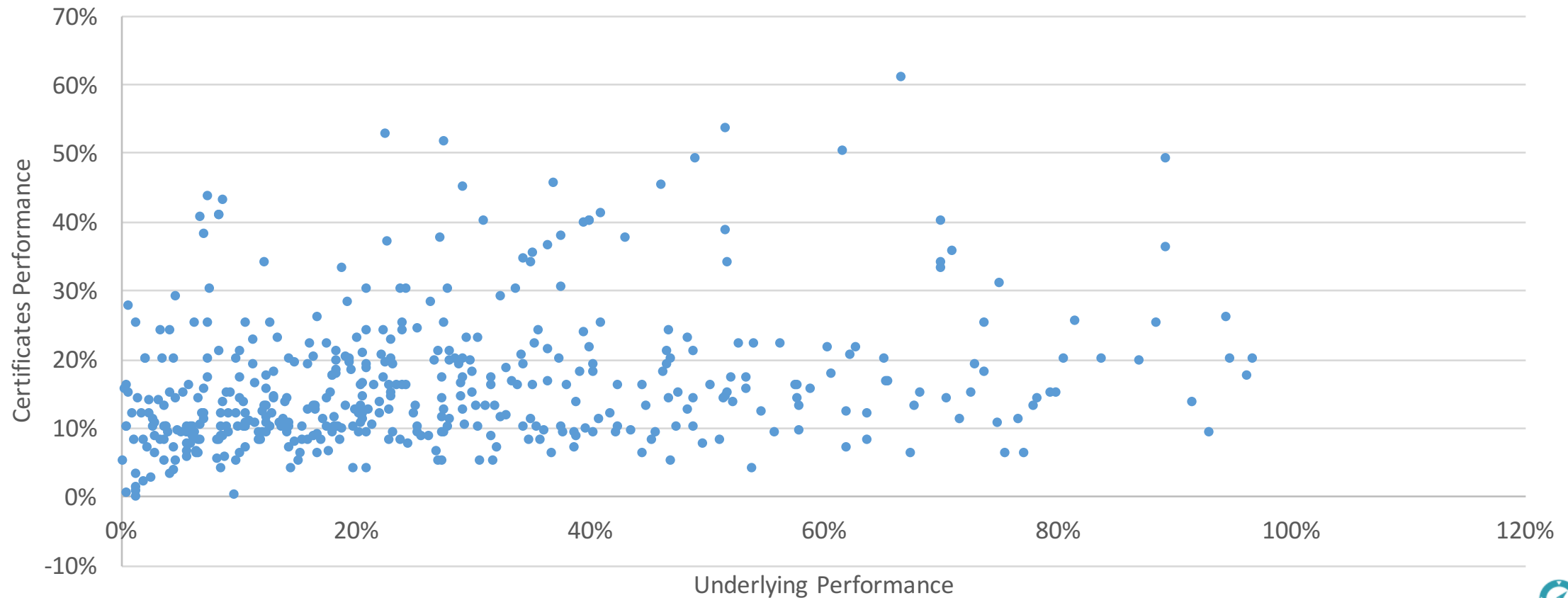
Scatter-plot: underlying with negative yields

Certificates with a underlying's negative performance have been considered. The certificates performance was, on average, higher than the underlying's one



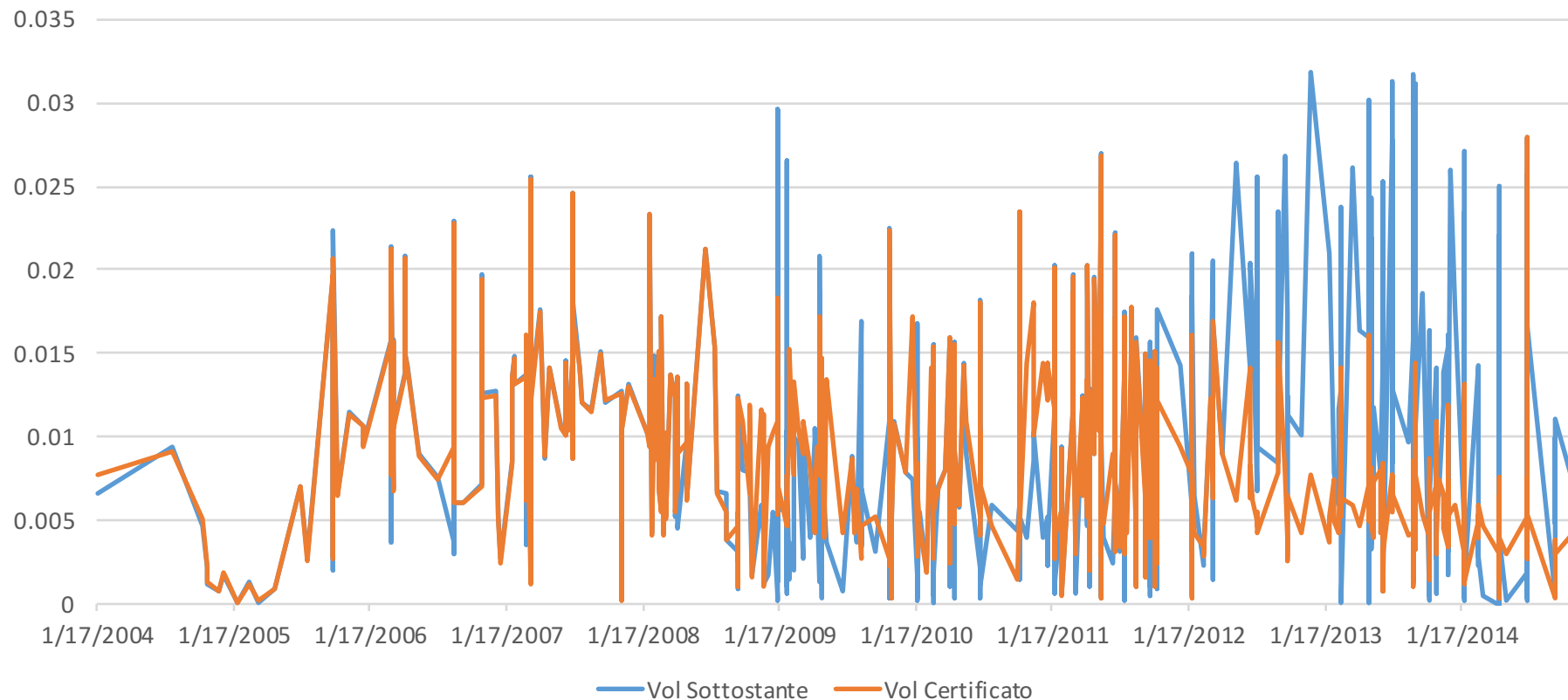
Scatter-plot: underlying with positive yields

Certificates with a underlying's positive performance have been considered. The average performance of the certificates has been positive



Volatility

The graph shows the volatility of the performance of the underlying and certified on the difference years of issue



Average volatility on underlying yields

0,358

Average volatility on certificates yields

0,296

The volatility of the underlying performance is greater than the certificates' one

Volatility has been calculated using this formula:

$$Vol_t = \sqrt{\frac{1}{n-1} * \sum_{i=1}^t (r_t - \mu)^2}$$

Consideration of dividends

- It's important to take into consideration that the investors do not receive dividends with certificates. This doesn't happen in case of a direct investment in the underlying
- This statement is completely true in the case of certificates that have equities as underlyings
- In the case of products on indices or baskets, where a direct investment in the underlying is not possible, the dividends' issue is more controversial. Risks such as tracking error may also intervene
- For the analysis, dividends paid by the various underlying in relation to the maturities and early redemptions of the certificate have been considered

Yield adjusted with dividends

In the period 2008-2010, alpha remains positive also considering the dividends

2004-2007	DIVIDEND YIELD	UNDERLYING PERFORMANCE	CERTIFICATES PERFORMANCE	ALPHA	ADJUSTED ALPHA
BONUS	3,66%	-40,68%	-39,84%	0,83%	-2,83%
2008-2010	DIVIDEND YIELD	UNDERLYING PERFORMANCE	CERTIFICATES PERFORMANCE	ALPHA	ADJUSTED ALPHA
BONUS	3,88%	-24,08%	-13,06%	11,02%	7,14%
BONUS CAP	3,80%	-3,41%	5,09%	8,51%	4,71%
2011-2014	DIVIDEND YIELD	UNDERLYING PERFORMANCE	CERTIFICATES PERFORMANCE	ALPHA	ADJUSTED ALPHA
BONUS	4,35%	16,22%	20,58%	4,37%	0,01%
BONUS CAP	3,45%	5,11%	2,03%	-3,08%	-6,53%