Financialization of Commodity Markets – Evidence from European Certificates Markets

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June 10, 2016, Institut Henri Poincarré, Paris

Outline

(1) Motivation & Literature

(2) European Certificates Market & Data

(3) Methodology

(4) Results

(5) Discussion & Outlook

Outline

Materials Resource Management

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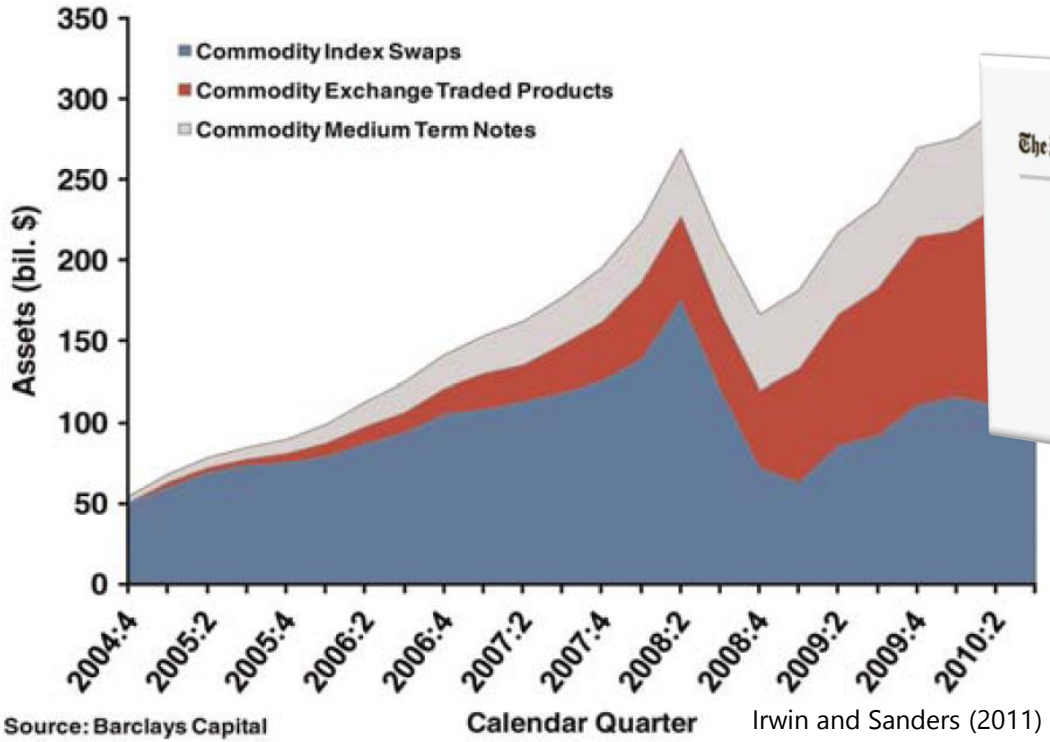
Motivation (I)

- Phenomenon of **financialization** of commodity markets has been **acknowledged**



Irwin and Sanders (2011)


The New York Times

BUSINESS DAY

A Bull Market Sees the Worst in Speculators

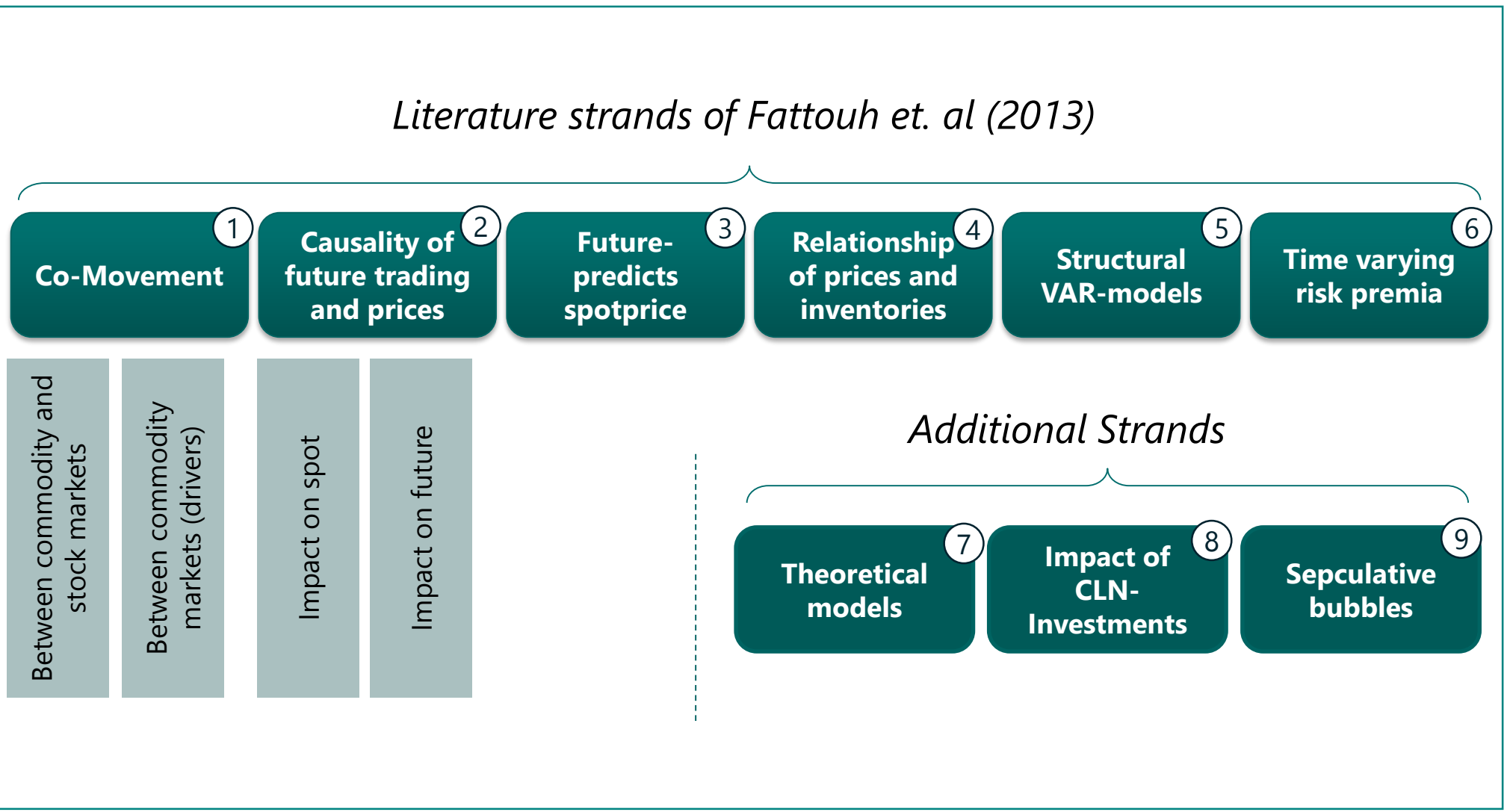
By DIANA B. HENRIQUES JUNE 13, 2008

In Washington, financial speculators have fat targets on their backs.

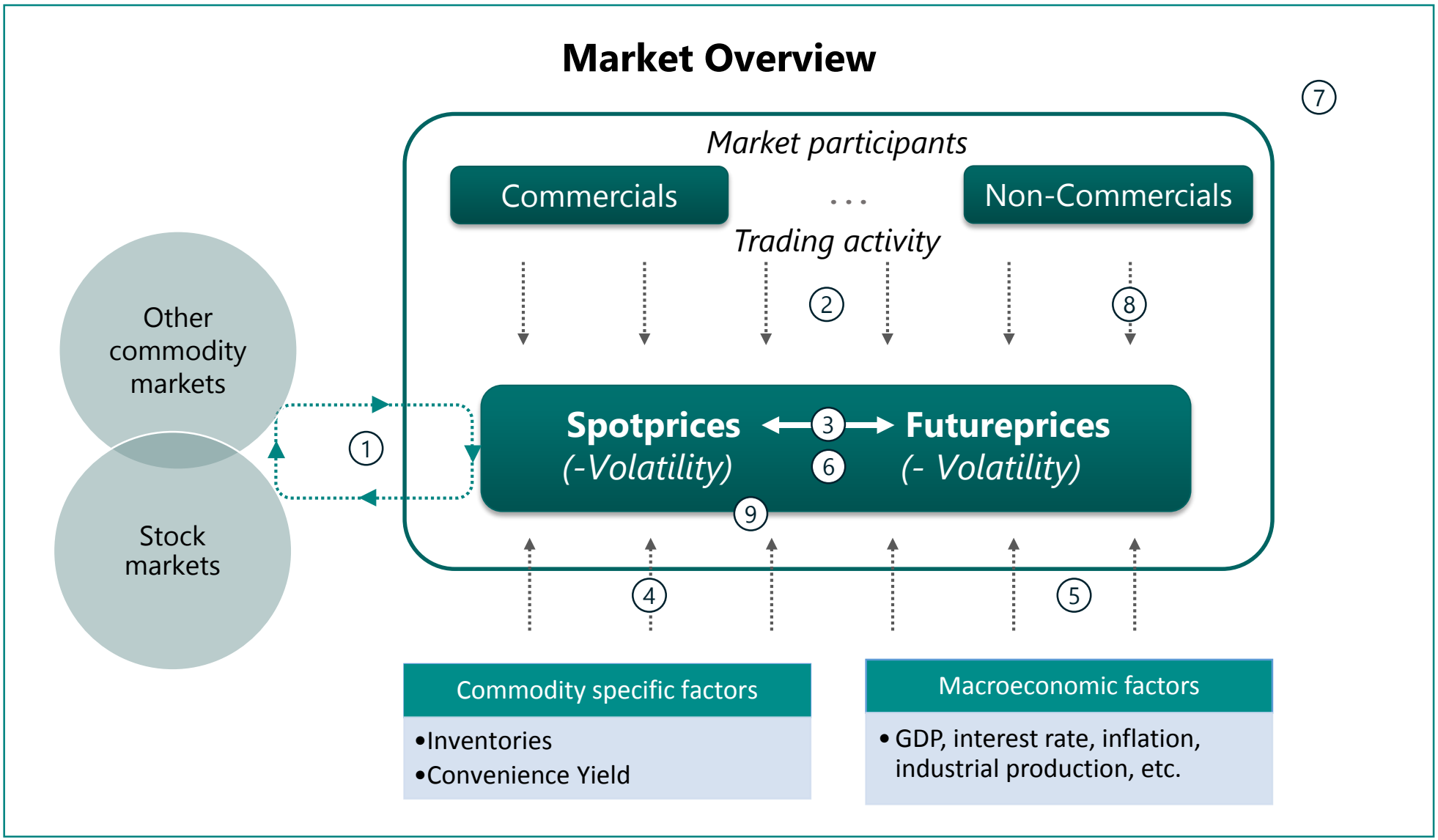
They are being blamed for high gas prices, soaring grocery bills and volatile commodity markets, and lawmakers are

➔ Yet, **implications** of financialization are still **unclear…**

Literature strands of financialization



Classification of financialization literature

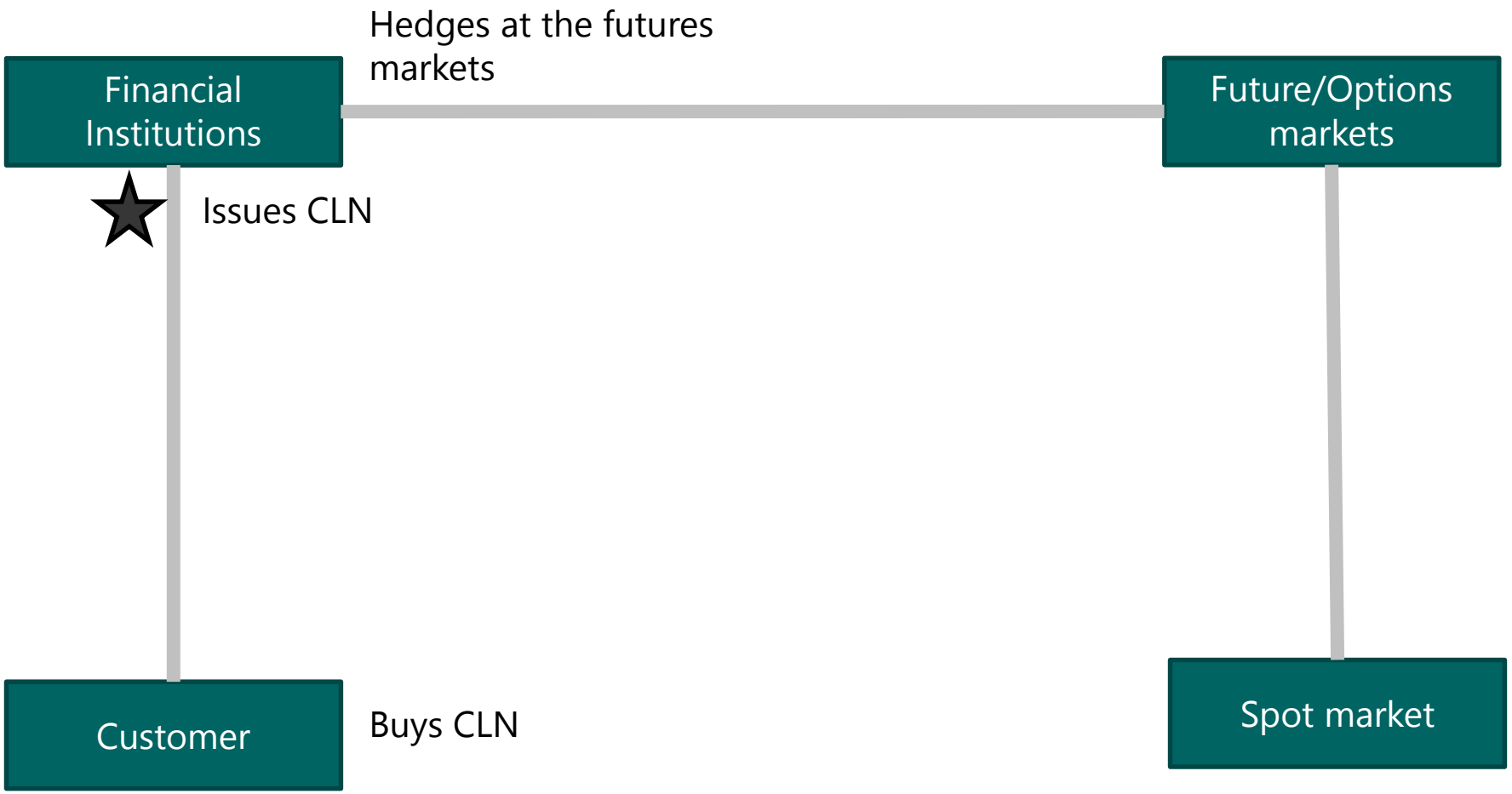


Motivation (II)

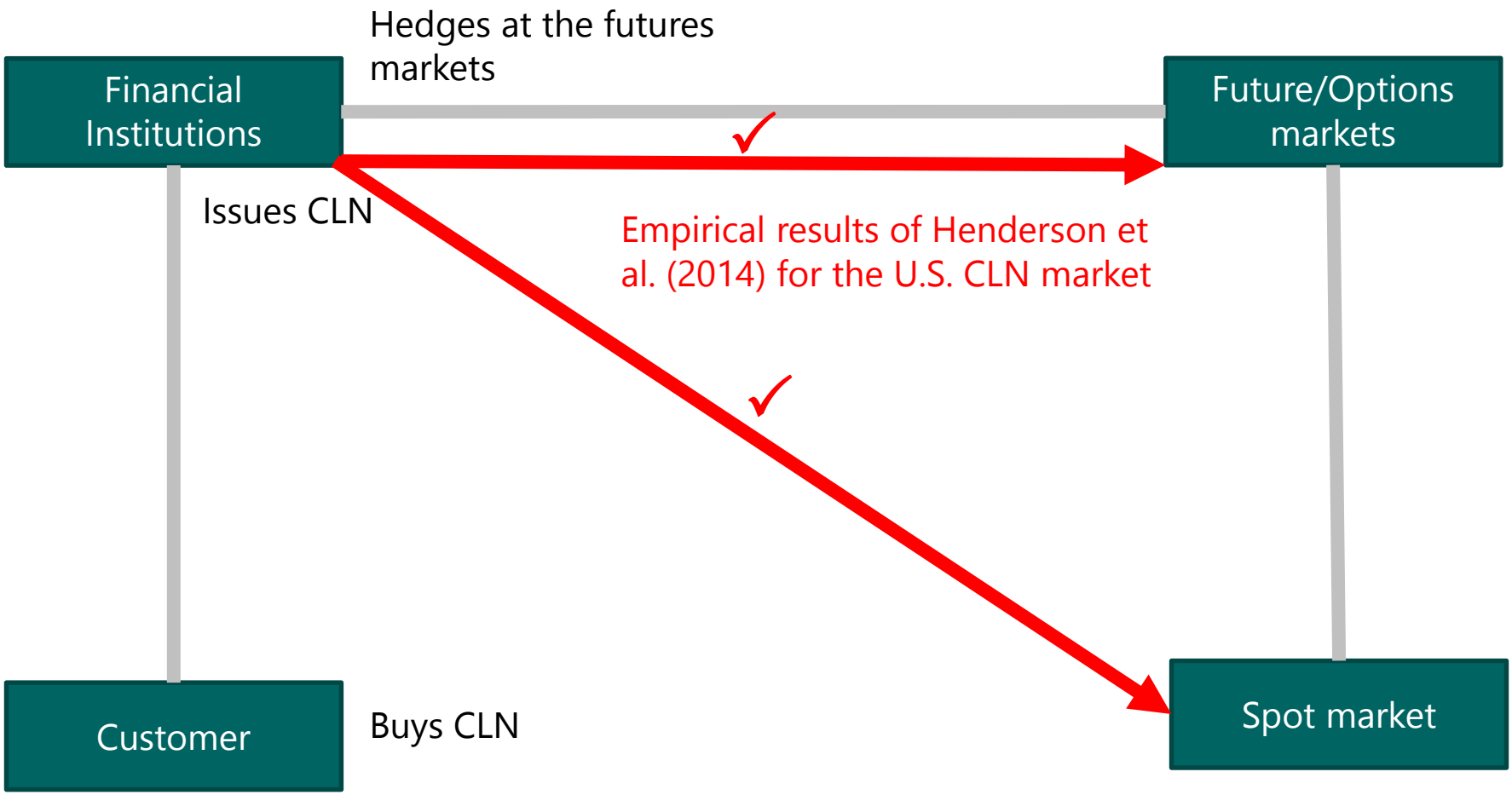
Henderson et. al 2015:
"New Evidence on the Financialization of Commodity Markets"
[Rev. Financ. Stud.]

- Analysis of Commodity-linked-notes (**CLNs**) for the U.S. market
- Use an **Event Study-Methodology**
- Find, that commodities show **significant abnormal price movements around the emission date.**
- Conclude, that price movements are due to **hedging activities** of emitting financial institutions.

Market Relationships for CLN



Market Relationships



Similar Discussion regarding Stock Options Emission

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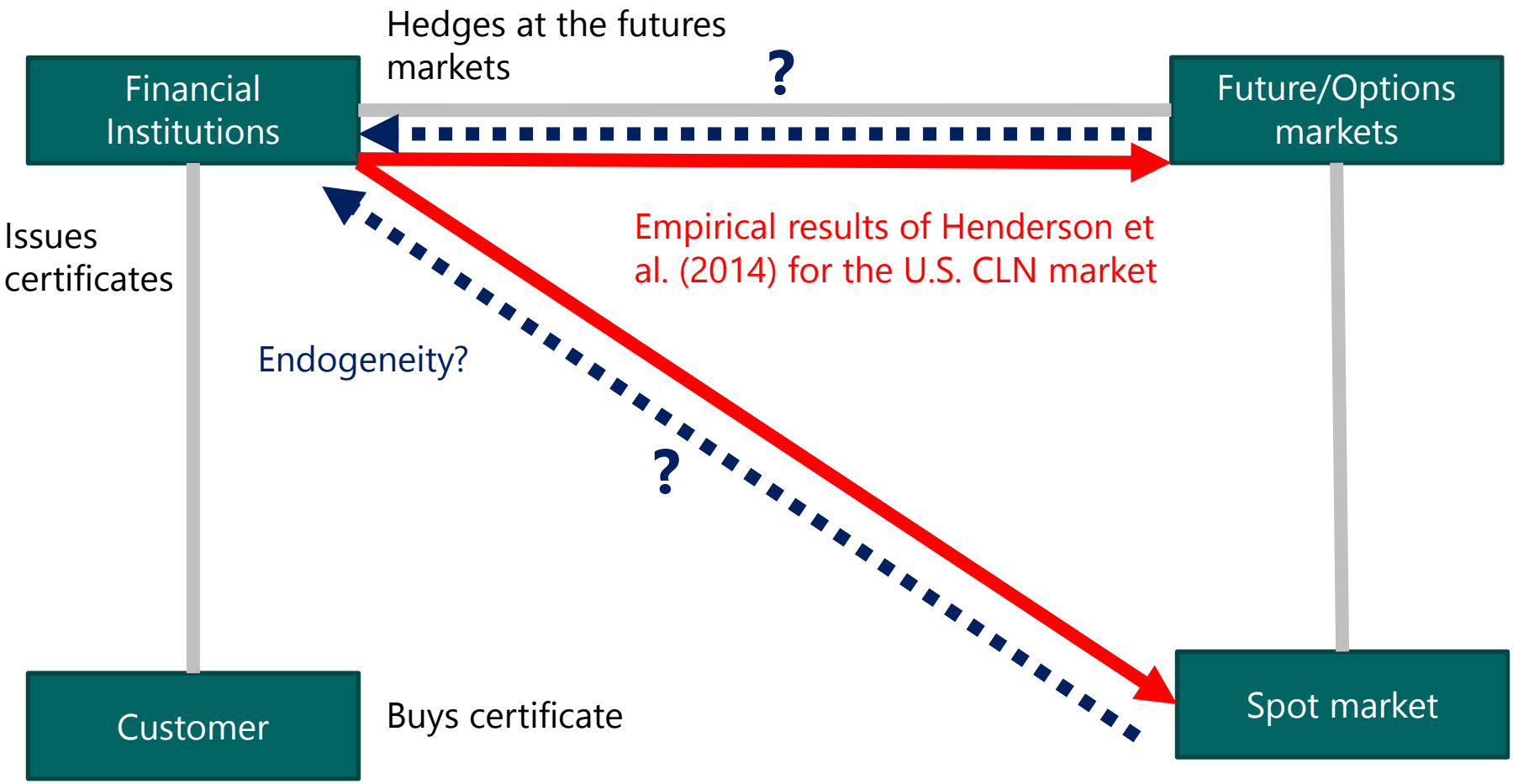
- Branch and Finnerty, (1981), Conrad (1989), and Detemple and Jorion (1990) consistently **find evidence for permanent price increases** in the underlying security **due to option introduction.**
- Conrad (1989), and Detemple and Jorion (1990) show also that **price increases are gradual** over up to two weeks **around emission**.
- Conrad (1989) terminates the beginning of the price effects of approximately **three days prior** to introduction.

- Ho and Liu (1997) show, that the base **prices are rising** permanently **before the introduction** of options.
- Sorescu (2000) determines **positive and negative price** effects of option introductions on underlying stock prices, **depending on the time period**.
- Faff and Hillier (2005) find significant positive and negative price effects around option listings. They argue that this finding **is more reflective of informed traders expectations** of the future values than effects of options introduction.

Research examining the impact of new option listing in equity markets **finds evidence** for abnormal returns around**, before and after emissions**.

No consensus regarding the exact **date** of occurrence of abnormal returns as well as of the underlying **cause** ➔ Rise the old **question of endogeneity**?

Market Relationships



? **Same effects in other markets?**

Objective of the paper

- **Confirmation** of the results of Henderson et al. (2015) for **European Market**
- Confirmation of the drawn conclusions:

→ Do **issuances drive commodity prices** or…

… is there an endogeneity and…

→ **prices drive the issuances?**

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The European Market

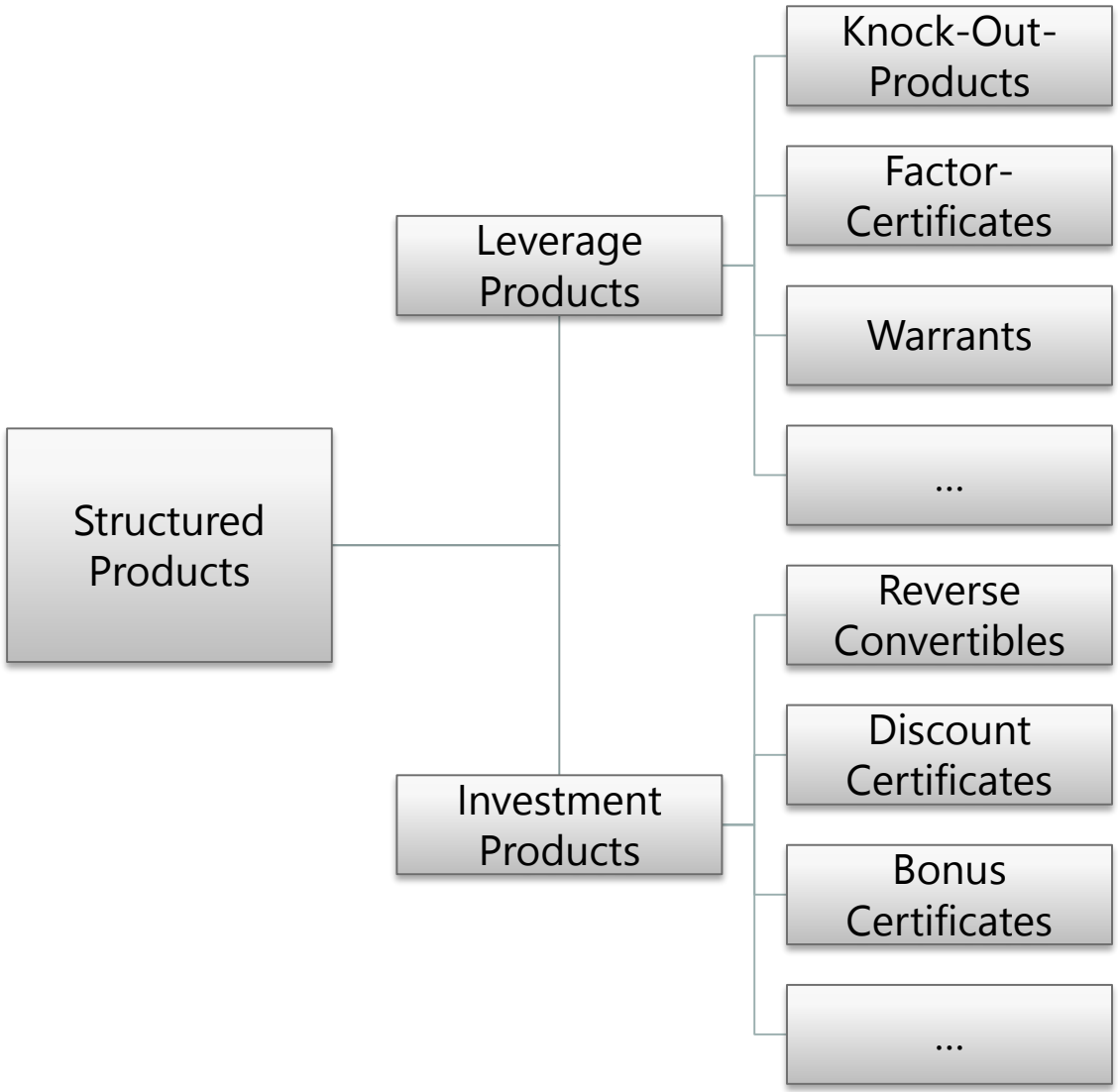
U.S. Market
Commodity Linked Notes (CLN)

European Market
Commodity Certificates

Commodity Certificates

- **Structured products → Bonds**
- **Exchange** traded and **OTC**
- **Payoff based** on the price of **underlying** commodities
- Different payoff profiles possible, e.g.
  - As **Call** or **Put**
  - With or without **barriers**
  - With or without **leverage**
  - With or without **knock-out /-in**
  - **…**

Important Types of Certificates



Example of a certificate discription

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VONTOBEL

Termsheet (Final Terms)
SPRINTER OPEN END

Vontobel Investment Banking
+41 (0)58 283 78 88 or www.derinet.ch

SSPA DESIGNATION: WARRANT WITH KNOCK-OUT (2200)

Call - Sprinter Open End Copper Future

PRODUCT DESCRIPTION

Sprinter Open End products are leveraged products with no fixed maturity, but like standard Sprinter warrants are characterised by the fact that they expire worthless with immediate effect when reaching or falling below (call) or reaching or exceeding (put) the particular knock-out level. Due to the low amount of capital employed in comparison to a direct investment in the underlying, they enable overproportionate participation in the performance of the underlying in accordance with the leverage and can therefore be used for speculation or the hedging of positions. The strike price and knock-out level are adjusted daily. The following applies as a rule: The closer the actual market price of the underlying to the strike price, the greater the leverage effect. In contrast to standard warrants, the price of the Sprinter Open End is only marginally affected by volatility.

In Switzerland, these financial instruments are considered structured products. They are not collective investment schemes within the meaning of the Swiss Federal Act on Collective Investment Schemes (CISA), and are therefore not subject to the regulations of the CISA or the supervision of the Swiss Financial Market Supervisory Authority FINMA. The investors bear the issuer's or the guarantor's credit risk.

Product information	
Issuer	Bank Vontobel AG, Zürich (Moody's Counterparty Risk Assessment A2 (cr))
Lead Manager	Bank Vontobel AG, Zurich
Paying, exercise and calculation agent	Bank Vontobel AG, Zurich
SSPA product type	Warrant with Knock-Out (2200), see also www.sspa-association.ch
Underlying	Copper Future (further details on the underlying see below)
Underlying at initial fixing	Copper Future Nov 2015 (Bloomberg Ticker: HGX5 Comdty)
Spot reference price	USD 2.0865

Example of certificate Pay-Offs

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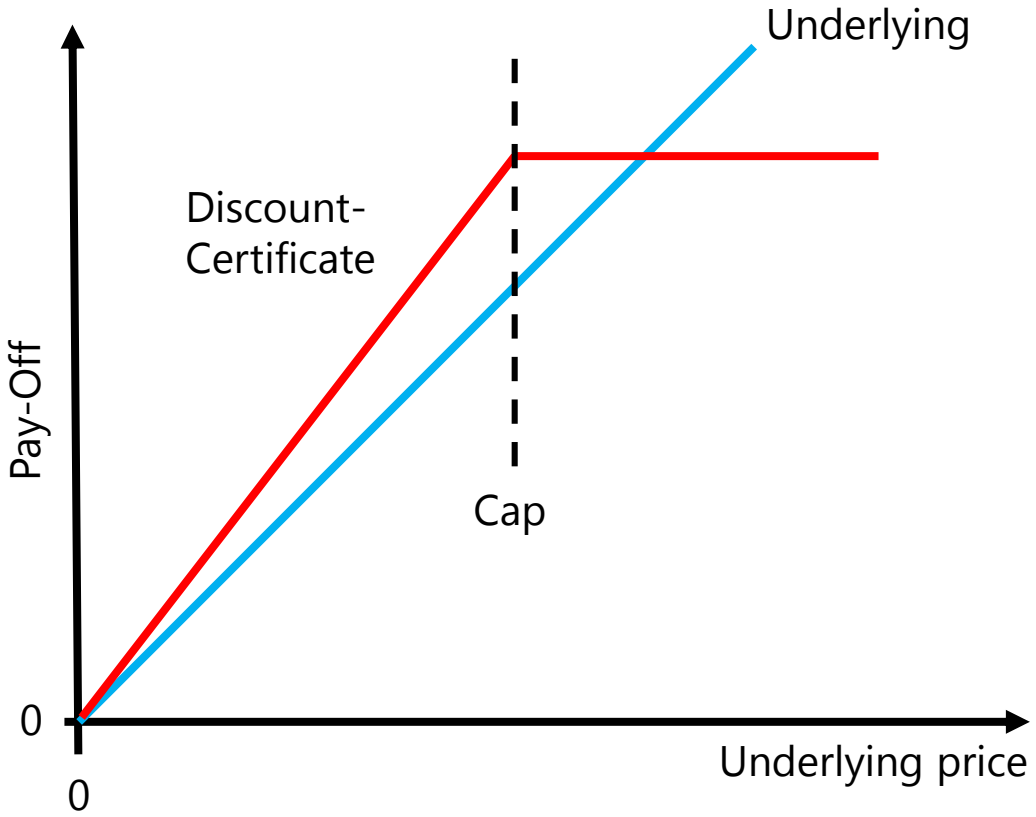
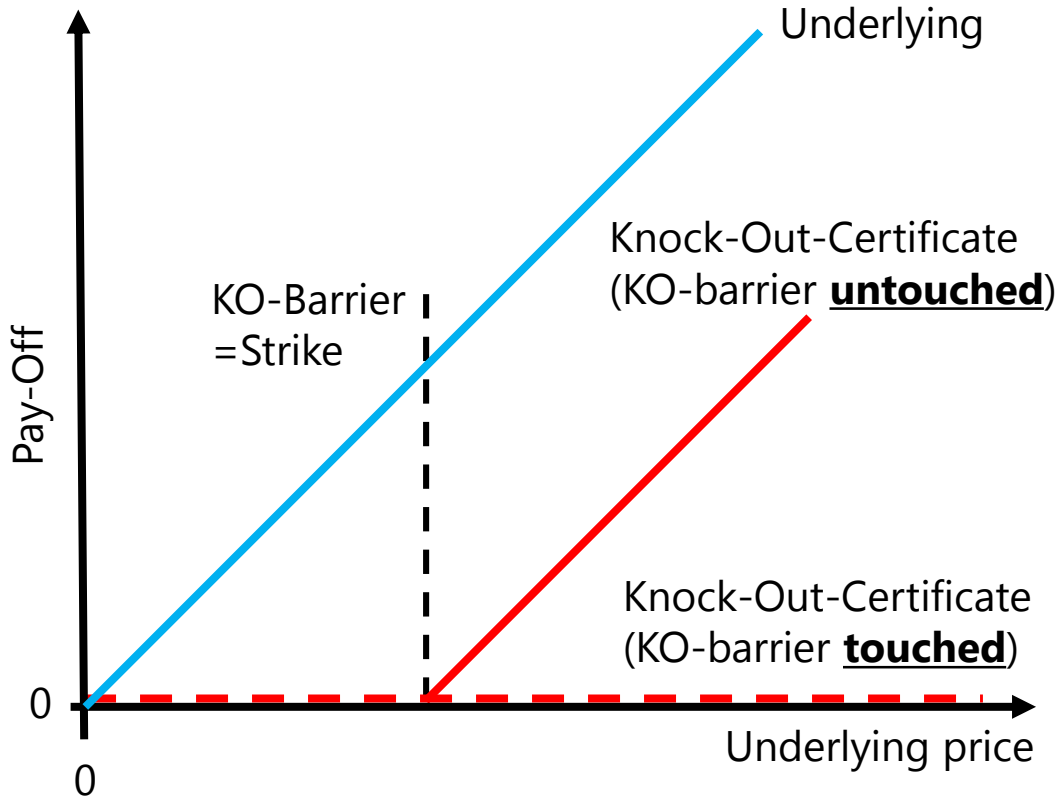
Discount-Certificate



„Best-Turbo-Certificate"

(KO-Certificate with
KO-barrier=Strike price)



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European market for Certificates

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European Market for structured products:

- Exchange Turnover **investment products**: 41.1 bn € in 2014
- Exchange Turnover **leverage products**: 75.0 bn € in 2014
- **German Exchanges** are responsible for 54% of investment products and 29% of leverage products

EUWAX in Stuttgart: German Market Leader for structured products: Market share of 61.75% for investment products and 66.49% for leveraged products in Germany

Commodities as third biggest group of underlyings (after stocks and indices). E.g. revenue share of knock-out-products 7.44% for commodities

Data

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- **15137** different commodity-certificates
- Responsible for 95% of **EUWAX**' revenue between 2009-2012

No. of issuances (call/put)	Brent	Gold	Copper	WTI	Nickel	Palladium	Platinum	Silver	Other Underly-ings
Total	1875/668	4997/1098	215/144	857/236	89/33	348/38	305/12	3448/490	256/24
Investment products	318/51	465/19	15/6	57/13	2/-	17/-	18/-	326/9	5/2
Bonus	207/43	243/19	11/6	25/11	2/-	9/-	16/-	168/9	5/2
Discount	111/8	222/-	4/-	32/2	-/-	8/-	2/-	158/-	-/-
Leverage products	1410/614	4379/1078	177/138	723/221	70/33	304/38	256/12	3055/480	147/22
Warrants	352/67	1146/292	12/10	148/20	9/2	56/3	16/-	1137/157	19/1
Knock-out products	1058/547	3233/786	165/128	573/201	61/31	247/35	239/12	1918/323	128/21
Other products	147/3	153/1	23/-	79/2	17/-	28/-	32/-	67/1	104/-

We gratefully acknowledge data from Boerse Stuttgart.

- For the corresponding daily **commodity prices** as well as index data we used **Thomson Reuters Datastream** and **Bloomberg**

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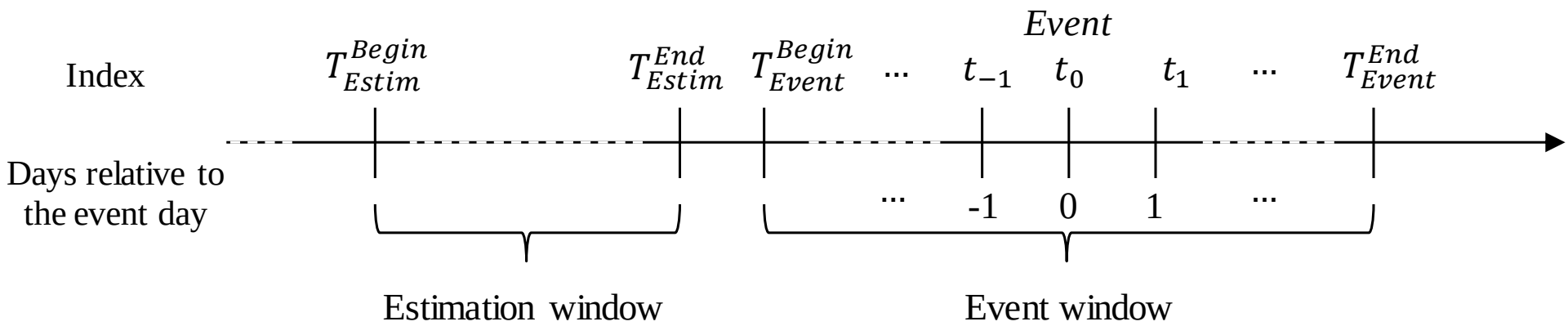
Methodology: Event Study

- Significance of abnormal returns (AR)
- AR as difference between observed returns of a commodity i and expected (normal) returns (NR):

$$AR_{i,t} = R_{i,t} - NR_{(i,t)}$$



Methodology: Event Study

- In general: **Two models** to estimate the normal return

(1) Constant mean return:

$$NR_{(i,t)} = \frac{1}{Estim.length} \sum_{Begin\ Estim}^{End\ Estim} R_{i,t}$$

(2) Market model:

$$NR_i = \beta_0 + \beta_{i,EM} \cdot R_{EM,t} + \beta_{i,EM,t+1} \cdot R_{EM,t+1} + \beta_{i,S\&P} \cdot R_{S\&P,t} + \beta_{i,USD} \cdot R_{USD,t} + \beta_{i,TBond} \cdot R_{TBond,t} + \beta_{i,VIX} \cdot R_{VIX,t} + \beta_{i,BDI} \cdot R_{BDI,t} + \beta_{i,INF} \cdot R_{INF,t} + \beta_{i,lag} \cdot R_{i,t-1}$$

- **Market** is represented by the returns of:
  - MSCI Emerging Markets Asia Index (EM)
  - Standard & Poor's 500 Index (S&P)
  - US Dollar Index futures contracts (USD)
  - JP Morgan Treasury Bond Index (TBond)
  - Chicago Board Options Exchange Volatility Index (VIX)

- **Macroeconomic control variables**:
  - Return of the ship transport costs (BDI)
  - Ten-year breakeven inflation rate change (INF)
- Lagged Return of the underlying commodity

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Results

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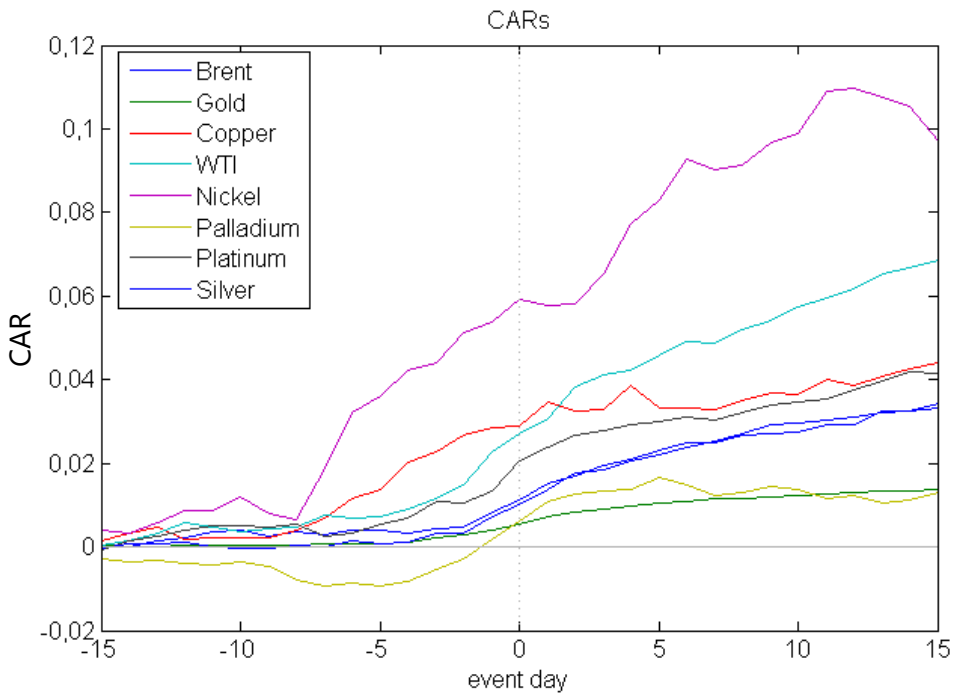
Non-parametric significance test of each day seperatly, according to the **Corrado-Rank-Test** over all call certificates with **market model**. Event window length of 3 days.

	p-value			ARs		
Day	[-1]	[0]	[1]	[-1]	[0]	[1]
Brent	0,0016 **	**0,0010 *** **	**0,0003 *** **	0,0028	0,0027	0,0035
Gold	0,0060 **	0,0010 **	**0,0000 *** **	0,0005	0,0007	0,0011
Copper	0,2547	0,7067	*0,0132 **	0,0030	0,0019	0,0073
WTI	**0,0002 *** **	0,0069 **	0,0540	0,0078	0,0041	0,0034
Nickel	0,4049	0,4966	0,6568	0,0028	0,0059	-0,0013
Palladium	*0,0331 **	0,0508	0,0601	0,0023	0,0024	0,0031
Platinum	*0,0143 **	**0,0005 *** **	*0,0309 **	-0,0005	0,0036	0,0002
Silver	**0,0002 *** **	*0,0122 **	0,0016 **	0,0037	0,0029	0,0036

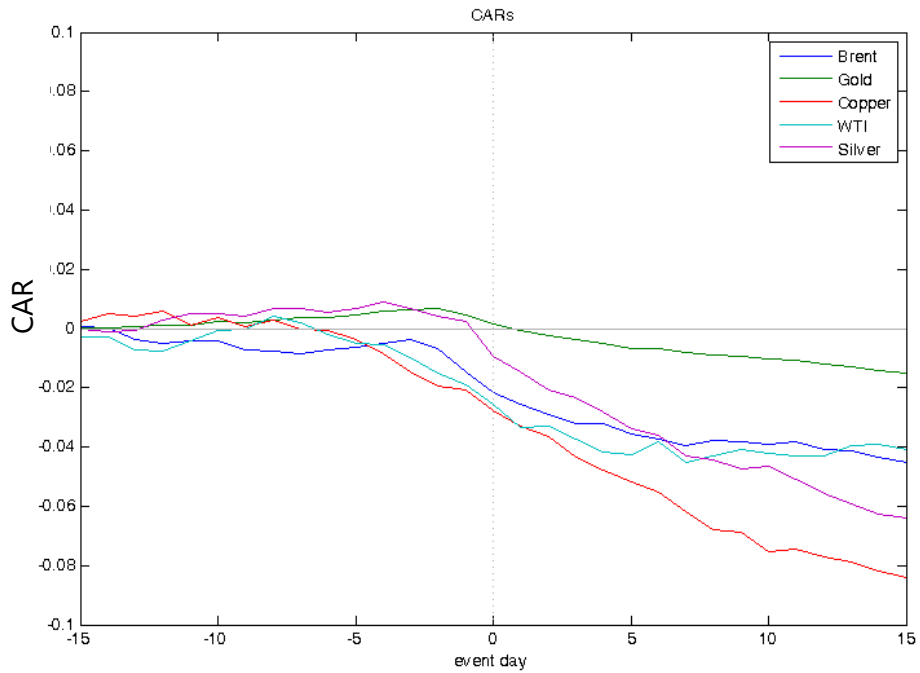
*, **, and *** denote significance at the 5%, 1%, and 0,1% levels, respectively

Results: Cumulated Abnormal Returns

$$CAR_{i,t} = \sum_{t\prime=Begin\ Event}^{t} AR_{i,t\prime}$$



Call-like



Put-like

*The ARs are calculated with the constant mean return approach for the full sample

Robustness: Parametric significance levels for call certificates

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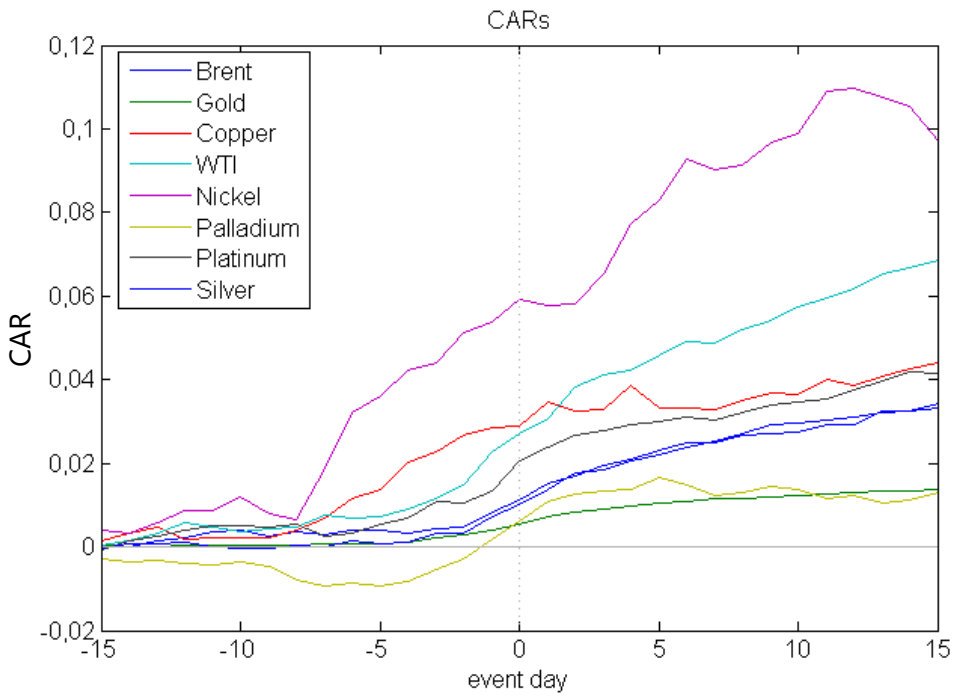
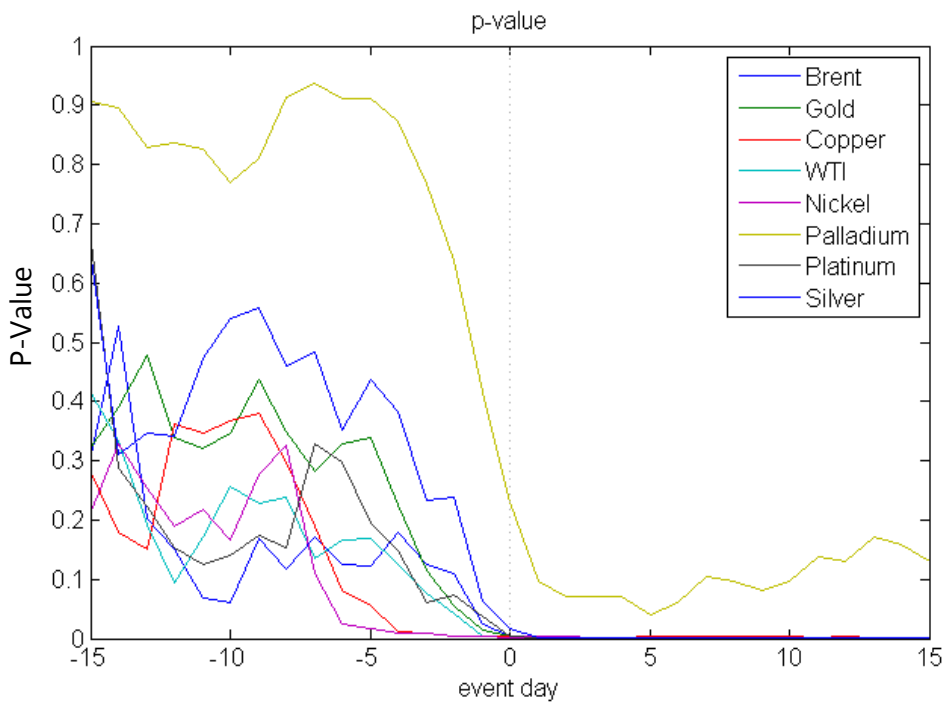
- p-value of all call certificates (with CARs as reference)
- Parametric test hypothesis: The ARs are normally distributed



Call-like



Respective P-Values

*The ARs are calculated with the constant mean return approach for all **call** certificates

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Robustness: Significance levels of different certificate types

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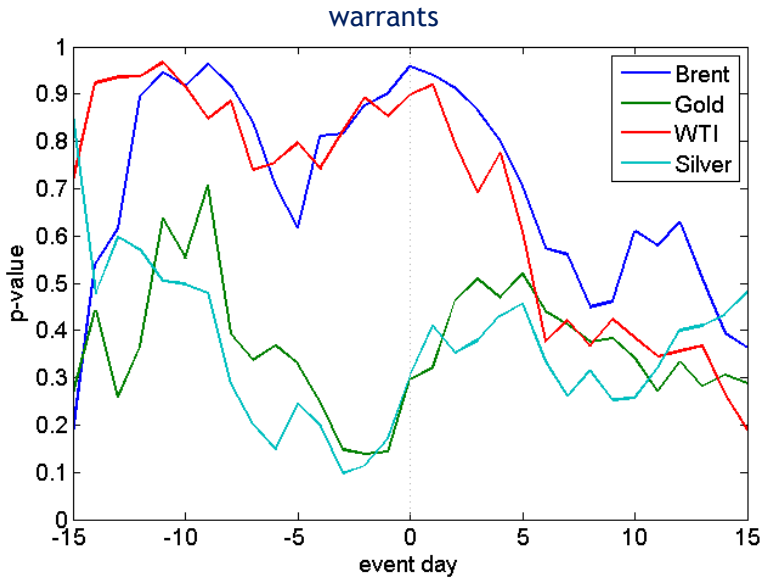
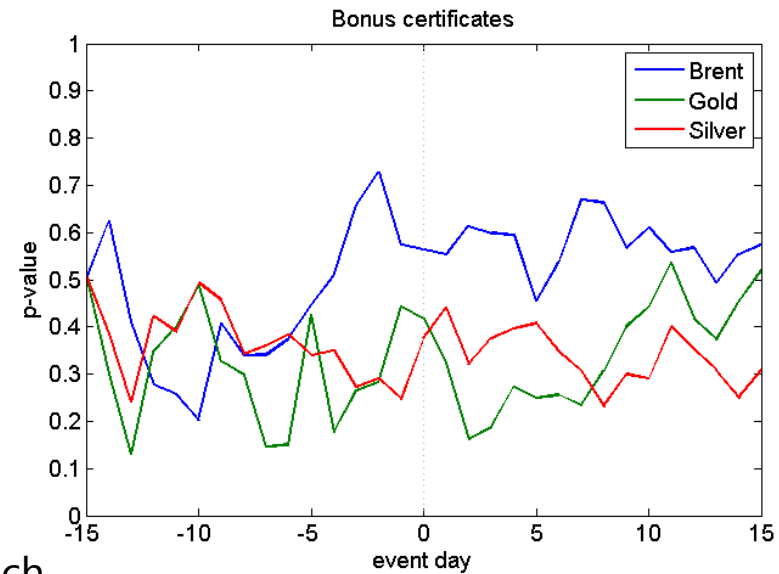
Warrants account for 23.4 % of the full call sample



Bonus certificates account for 5.5 % of thefull call sample



*The ARs are calculated with the constant mean return approach

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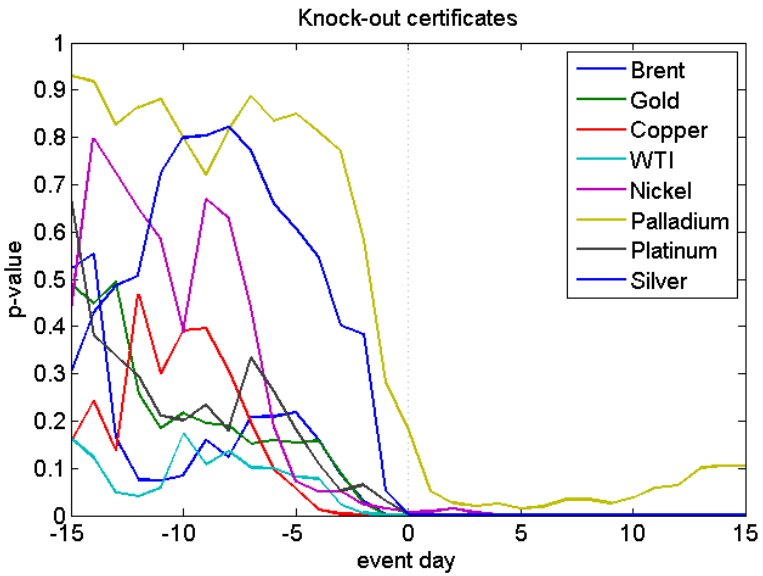
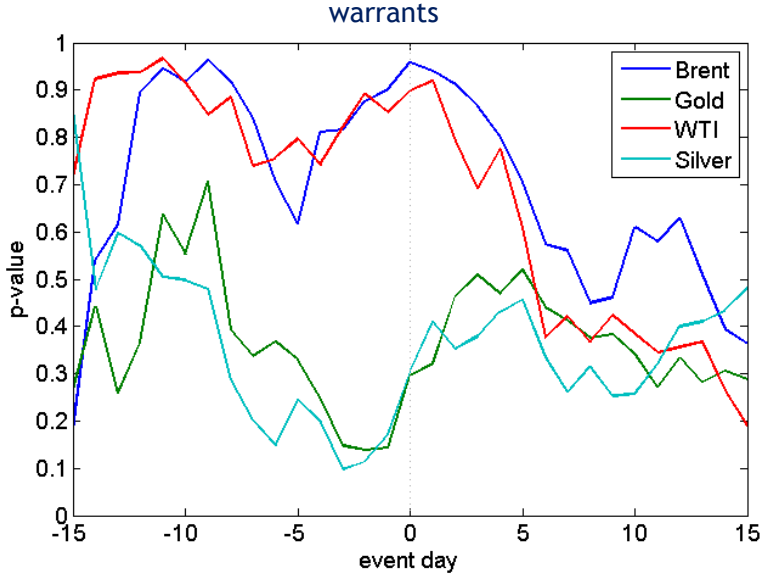
Robustness: Significance levels of different certificate types

Materials Resource Management

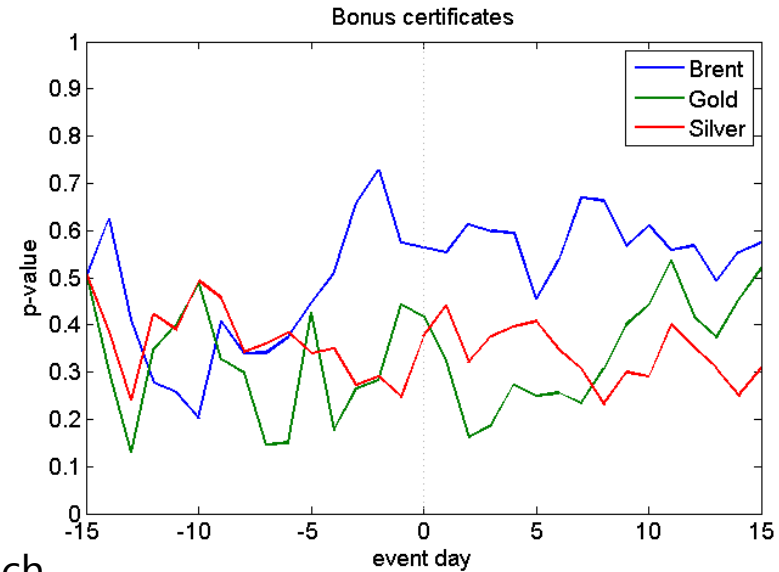
Knock-outs account for **61.5 %** of the full call sample



23.4 %



5.5%



! **Only Knock-Out-Certificates** show **significant** abnormal returns

! The **overall significance** is due to the KO-CLNs

*The ARs are calculated with the constant mean return approach

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Robustness: Significance levels of knock-out certificates

Materials Resource Management

Non-parametric significance test of each day seperatly, according to the **Corrado-Rank-Test** over **KO** call certificates with **market model**. Event window length 3 days.

	p-value			ARs		
Day	[-1]	[0]	[1]	[-1]	[0]	[1]
Brent	**0,0001 *****	**0,0000 *****	**0,0004 *****	0,0051	0,0056	0,0051
Gold	0,0014 **	**0,0000 *****	**0,0000 *****	0,0017	0,0021	0,0026
Copper	*0,0480 **	0,3869	*0,0209 **	0,0068	0,0040	0,0069
WTI	**0,0002 *****	0,0017 **	*0,0246 **	0,0093	0,0067	0,0045
Nickel	0,2151	0,2100	0,6538	0,0052	0,0077	-0,0013
Palladium	0,0067 **	0,1012	*0,0154 **	0,0045	0,0009	0,0047
Platinum	0,0085 **	**0,0000 *****	0,0645	-0,0008	0,0050	-0,0003
Silver	**0,0000 *****	**0,0003 *****	**0,0002 *****	0,0064	0,0061	0,0062

*, **, and *** denote significance at the 5%, 1%, and 0,1% levels, respectively

Further robustness checks

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- Calculation of the abnormal returns:
  - Market Model
  - Constant Mean Return Approach
- Significance Tests
  - Parametric (Normal distribution assumption)
  - Non-parametric (Corrado-Rank-Test, no distribution assumption)
- Time Windows
  - Different length, start and end points for the event as well as estimation window
  - Daily significance levels and significance levels for the cumulated event window
- Different underlying commodities; **spot** and **future prices**

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Summary & Discussion

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- **CLNs** show highly **significant abnormal returns**, when emitted
- The significant p-values can also be seen one or **several days prior** to the emission
- The effects are only driven by **Knock-out products**
  - ➔ First thought: price movements knock-out certificates ➔new certificate emissions ➔ significant p-values
  - **But:** Call KO certificates significant for positive ARs➔ no knock out
  - ➔ We suppose: price movements ➔ old certificates don't represent new conditions ➔ new certificates are issued ➔ significant p-values
- **No consensus** in historical discussion on impact of new **option listings**
- **Feedback from practitioners**: Suggestion, that effects may be due to abnormal returns and not the other way round

Outlook and next steps

Materials Resource Management

- Are the **results** an **effect of the hedging** due to the issuances **OR/AND** are the **issuances an effect** of abnormal returns **of the underlyings**?
- **Analysis of Henderson's** U.S. CLN data **prior** to emission as well as regarding different **product types**
- **Effects of days**, when **KO**-certificates were **knocked out**
- **Relation** between **knock-out** of certificates and new emissions
- **Effects of issue size** (volume) → New data

Thank you for your attention