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The impact of accounting standards on the allocation of pension assets

IASB Research Forum  
Brussels, 28-29 November 2017
Big Picture
Effects studies of regulation

Regulation → Mechanism/Channel → Effects

Accounting Regulation → Mechanism/Channel → Intended Effects

Mechanism/Channel → Unintended Effects

IAS 19R → Incentives → Pension asset allocation
• Christian Stracke, Global Head of Credit Research, PIMCO: „the volatility of the [pension] liability is a critical factor in credit analysis.“

• Commenting on the imminent IAS 19R:
  — Deutsche Lufthansa AG states that “changes in the discount rate … and … fluctuations in the market value of plan assets, can in particular result in considerable, unpredictable fluctuations in the balance sheet.”

  — Deutsche Post AG (2010 comment letter): “… highlighting short-term volatility … may .. lead to inefficient investment decisions by entities (in order to avoid such volatility).”
What got us interested
Empirical trends

Changes in firms‘ pension asset allocations around IAS 19R adoption

% bonds in plan assets: affected firms
% bonds in plan assets: unaffected firms
% equities in plan assets: unaffected firms
% equities in plan assets: affected firms
In a nutshell

- **What are we studying?**
  - Research question: *How does mandatory adoption of IAS 19R affect pension asset allocation decisions made by pension plan sponsors?*

- **Why do we care?**
  - Motivating question: Unintended ‘real’ effects of changes in accounting standards – here: on firms’ investing decisions?
  - Concerns in practice about IAS 19R, which increases pension-induced equity volatility

- **How do we draw conclusions?**
  - Exploit exogenous shock to expected pension-induced equity volatility – caused by mandatory adoption of IAS 19R
  - Apply difference-in-differences design to facilitate causal inference
  - Interviews with sample firm Chief Accountants provide “evidence on the actions and beliefs of individuals and institutions [to] bolster causal claims based on associations” (Gow, Larcker and Reiss 2015: 4)
Prior literature and contribution
Three related research streams

- Real effects of accounting standards and accounting changes
- Determinants of pension asset allocations
- Earnings management in the context of pension accounting

IAS 19R adoption → Earnings management incentives → Pension asset allocation
Institutional background
Defined benefit plans in Germany

Defined benefit plans

Internal funding
- sponsor → retiree

External funding
- sponsor → retiree
- fund

Assets
- funding deficit €21.6b
- plan assets €8.0b

Liabilities
- DBO €8.7b
- €20.9b
- = €29.6b

Source: Volkswagen AG, 2013
Before IAS 19R
Sponsors choose between three methods of accounting for actuarial gains and losses:

1. The **corridor** method (similar to FAS 87) → smooth earnings, equity
2. Immediate recognition in profit or loss (virtually unused) → volatile earnings and equity
3. Immediate recognition in OCI (‘OCI method’) → smooth earnings, volatile equity

IAS 19R
Eliminates methods 1 and 2, leaving 3

1. Corridor method
2. P&L method
3. **Immediate recognition in OCI** (‘OCI method’)

**Actuarial G/L now affect** pension liabilities, OCI, equity, and all related financial ratios *immediately*
Institutional background
An example (cont’d)

Concern: Pension-induced equity volatility due to:

- Fluctuations in the DBO – primarily due to discount rate changes
- Fluctuations in plan assets – primarily due to market risk
  — See example above (Volkswagen AG, 2014)
Conceptual level

Mandatory adoption of IAS 19R

theory: causal effect

Pension asset allocation / risk taking

Construct validity

Operational level

Indicator variable TREAT

%EQ %BONDS

Confounds

Construct validity

Internal validity
Mandatory IAS 19R adopters using the corridor method (treatment firms):

1. expect IAS 19R to increase equity volatility;

2. have incentives to avoid such volatility; and

3. view plan asset reallocation as an effective, efficient (i.e., relatively low-cost), and de-facto feasible countermeasure.
To validate our key assumptions and support causal inference, we:

- Conducted seven **semi-structured interviews** with sample firms‘ CAOs;
- Analyze sample firms‘ **comment letters** leading up to IAS 19R; and
- Review related **statements** in firms‘ annual reports, the media, and from analysts and rating agencies.

This evidence generally validates our assumptions:

- **Assumption 1**: Interviewees clearly understood how moving from the corridor method to the OCI method would affect the book value of equity.

- **Assumption 2**: Interviewees explained incentives related to the level and volatility of book equity, including corporate bylaws and charters making dividend distribution conditional on maintained minimum ratios of book value of equity to total assets.

- **Assumption 3**
  - Interviewees share that firms did adjust asset allocations, *inter alia*
  - Sponsor firms influenced pension asset allocations through asset allocation committees
\( H_1 \) Treatment firms (which apply the corridor method) will, on average, reduce (increase) the percentage of equities (bonds) in their pension assets relative to control firms (which apply the OCI method) upon transition to IAS 19R.

\( H_2 \) When adopting the OCI method under IAS 19R, treatment firms’ relative reduction (increase) in the portion of equities (bonds) in pension assets will, on average, vary with firms’ (a) exposure to pension plans and (b) level of funding deficits.
Construct validity
Main independent variable

Treatment firms’ transition to IAS 19R

%EQ/%BONDS for TREAT = 1

%EQ/%BONDS for TREAT = 0

Pre-Treatment Period
(POST = 0; 2 years)

Post-Treatment Period
(POST = 1; 2 years)

March 2008 Discussion Paper
April 2010 Exposure Draft
June 2011 IAS 19R published
June 2012 IAS 19R endorsed
1 Jan 2013 IAS 19R effective
### Construct validity

**Dependent variables**

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<thead>
<tr>
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<th>DEC. 31, 2014</th>
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<tr>
<td>Cash and cash</td>
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<td>–</td>
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<tr>
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<td>271</td>
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<tr>
<td>Debt instruments</td>
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<td>Direct investments in</td>
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<td>real estate</td>
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<td>87</td>
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<td>Real estate funds</td>
<td>234</td>
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<tr>
<td>Other funds</td>
<td>460</td>
<td>4</td>
<td>317</td>
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<tr>
<td>Other instruments</td>
<td>18</td>
<td>519</td>
<td>46</td>
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</tbody>
</table>

\[ \%EQ = \frac{(292+2,172)}{9,224} = 26.7\% \]

\[ \%BONDS = \frac{(1,601+3,533)}{9,224} = 55.7\% \]

\[ \%EQ = 27.0\% \]

\[ \%BONDS = 54.5\% \]

Source: Volkswagen AG, Annual Report 2014
Internal validity
Ruling out confounds

before treatment

Treatment group:
Ø cholesterol = 250

Control group:
Ø cholesterol = 250

after treatment

Treatment group:
Anti-Cholesterol drug
Ø cholesterol = 190

Control group:
Placebo
Ø cholesterol = 245

Δ = -5

Δ = -60

Treatment effect: DiD = -55

- Controlled random experiment as the gold standard in effect studies
- Key assumptions include:
  - Under random assignment, treatment and control groups are comparable
  - They would have developed identically absent treatment
  - Treatment timing is clear; treatment subjects comply
Internal validity
Our identification approach

**before treatment**

**Treatment group:** Corridor
- $\bar{\%}EQ = 27.3\%$

**Control group:** OCI (voluntary)
- $\bar{\%}EQ = 30.0\%$

**after treatment**

**Treatment group:** OCI (mandatory)
- $\bar{\%}EQ = 23.6\%$

**Control group:** OCI (mandatory)
- $\bar{\%}EQ = 27.9\%$

$\Delta = 3.7$

$\Delta = 2.2$

**Treatment effect:** DiD = -1.5

- **Not** a controlled random experiment: Firms self-select into control group
- Need for bigger 'econometric guns' (and more assumptions): Propensity score matching on covariates shown to affect $TREAT$
- Lingering internal validity threat: Unobservable, time-variant correlated omitted factors that affect the treatment and control groups differently
To test $H_1$, we estimate the following regression:

$$ASSET_ALLOC_{it} = \beta_0 + \beta_1 TREAT_{it} + \beta_2 Post_{it} + \beta_3 Post \times TREAT_{it} + \sum_{k=4}^{21} \beta_k Controls_{it} + \epsilon_{it}$$

with

- $TREAT = \text{an indicator variable capturing treatment observations}$
- $Post = \text{an indicator variable capturing post-treatment periods}$
- $Post \times TREAT = \text{an indicator variable capturing the incremental effect of IAS 19R on treatment firms relative to control firms in post-treatment periods (i.e., the treatment effect)}$

The coefficient of interest, $\beta_3$, tests $H_1$ and is predicted to be negative (positive) for $ASSET_ALLOC = %EQ$ ($ASSET_ALLOC = %BONDS$).
To test $H_2$, we estimate the following regression:

$$\text{ASSETALLOC}_{it} = \gamma_0 + \gamma_1 \text{TREAT}_{it} + \gamma_2 \text{TREAT} \times \text{PP_CHAR}_{it} + \gamma_3 \text{Post}_{it} + \gamma_4 \text{Post} \times \text{PP_CHAR}_{it} + \gamma_5 \text{Post} \times \text{TREAT}_{it} + \gamma_6 \text{Post} \times \text{TREAT}_{it} \times \text{PP_CHAR}_{it} + \sum_{k=7}^{24} \gamma_k \text{Controls}_{it} + \epsilon_{it}$$

(3)

with

- $\text{PP_CHAR}$ = pension plan characteristics $\text{Exp}$ and $\text{Fund}$
- $\text{Exp}$ = as above: exposure; i.e., plan assets divided by equity book value
- $\text{Fund}$ = pension funding ratio, i.e., plan assets divided by the defined benefit obligation
- $\text{Post} \times \text{TREAT} \times \text{PP_CHAR}$ = treatment effect for obs with non-zero values of the conditioning variables, $\text{Exp}$ and $\text{Fund}$, respectively

The coefficient of interest, $\gamma_6$, tests $H_2$ and is predicted to differ from 0.
### Panel A. Descriptive Statistics

#### Pre-Treatment Period (aggregated over 2010 and 2011)

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<tr>
<th>Variable</th>
<th>treatment observations</th>
<th>control observations</th>
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<td>N</td>
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<tr>
<td>%EQ</td>
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<td>%BOND</td>
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<td>%OTHER</td>
<td>108</td>
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<td>%PROPERTY</td>
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<td>Lev</td>
<td>108</td>
<td>63.9</td>
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<tr>
<td>FF</td>
<td>108</td>
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<td>Size</td>
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### Panel A. Univariate Analysis

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<th>Difference (Post-Pre)</th>
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<td></td>
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</tr>
<tr>
<td>N</td>
<td>Mean</td>
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<td>Mean</td>
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</table>

<table>
<thead>
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<th>%BONDS</th>
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<th>Post-Treatment</th>
<th>Difference (Post-Pre)</th>
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<tr>
<td>N</td>
<td>Mean</td>
<td>N</td>
<td>Mean</td>
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<tr>
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### Panel B. Multivariate Analysis – Tests of $H_1$

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<td>(0.22)</td>
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<tr>
<td>$Post$</td>
<td>-</td>
<td>+</td>
<td>-2.84</td>
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<tr>
<td></td>
<td></td>
<td>(-2.82)$^{***}$</td>
<td>(-3.53)$^{***}$</td>
</tr>
<tr>
<td>$Post \times TREAT$</td>
<td>-</td>
<td>+</td>
<td>-2.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-3.35)$^{***}$</td>
<td>(2.43)$^{**}$</td>
</tr>
</tbody>
</table>

- Controls: Yes
- Industry Fixed Effects: Yes
- Adjusted $R^2$: 0.334, 0.296
- N: 216, 216
## Empirical results

**Multivariate tests of H2 (Table 3 C)**

<table>
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<th>PP_CHAR = Fund</th>
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<tr>
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<td>%EQ</td>
<td>%BONDS</td>
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<tr>
<td></td>
<td></td>
<td>(2.04)</td>
<td><strong>(-0.97)</strong></td>
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<tr>
<td><strong>Fund</strong></td>
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<td>-0.31</td>
<td>0.07</td>
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<td></td>
<td></td>
<td>(-2.82)</td>
<td>*** (0.49)</td>
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<td>(-0.61)</td>
<td>(0.76)</td>
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<td>(0.18)</td>
<td>(-4.12)</td>
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<tr>
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<tr>
<td></td>
<td></td>
<td>(-6.05)</td>
<td>*** (3.43)</td>
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<td><strong>Post×TREAT</strong></td>
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<td>-6.70</td>
<td>9.08</td>
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<td></td>
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<td>(-5.69)</td>
<td>*** (3.33)</td>
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<td><strong>Post×TREAT×PP_CHAR</strong></td>
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<td>-0.17</td>
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<tr>
<td></td>
<td></td>
<td>(4.36)</td>
<td>*** (-3.24)</td>
</tr>
</tbody>
</table>

**Controls**

Yes Yes Yes Yes

**Industry Fixed Effects**

Yes Yes Yes Yes

**Adjusted R^2**

0.344 0.304 0.336 0.301

**N**

216 216 216 216
Several prior papers have analyzed the relation between pension accounting standards and the pension asset allocation

— Amir and Benartzi (1999 JAAF) is the first to establish a link between accounting standards and the pension asset allocation; firms avoid recognition of an additional minimum pension liability under US GAAP.

— Using a pre/post comparison, Amir, Guan and Oswald (2010 RASt) establish a time-series shift in pension asset allocations around the introduction of the OCI method in the UK and the US.

— Most closely related to our study, Anantharaman and Chuk (forthcoming TAR) documents an IAS 19R adoption effect on pension asset allocations for Canadian IFRS firms, relative to a US control group. However, the assumed mechanism is a concern about earnings volatility, as these authors focus on IAS 19R’s elimination of the expected rate of return on plan assets, which it replaces with the notion of “net interest cost”.
Before IAS 19R
Net pension expense reflects:

1. **Interest cost**
   \[ = \text{DBO} \times \text{discount rate} \]

2. **Expected return on plan assets**
   \[ = \text{FV of plan assets} \times \text{ERR} \]

IAS 19R
Eliminates expected rate assumption; net pension expense now reflects:

**Net interest cost**
\[ = (\text{DBO} - \text{FV of plan assets}) \times \text{discount rate} \]

*Ceteris paribus*, the ERR effect should matter (i.e., earnings should fall) where:

1. Funded status is high (i.e., FV of plan assets large relative to DBOs); and
2. Expected rate of returns tend to deviate more from discount rates.

- In contrast to Anantharaman and Chuk (2017), we do not expect the ERR effect to be large in Germany:
  - Median funded status Germany = 62.8% vs Canada = 80.2%
  - Median ERR-DR spread Germany = 0.52% vs Canada = 1.77%
This test isolates the 'ERR effect' of IAS 19R.

Unlike Anantharaman and Chuk (2017), we find treatment firms strongly shifting out of bonds relative to control firms, which contradicts H₁.

Potential explanations: Differences in funded status and ex-ante ERRs.

Highlights need for careful jurisdiction-level studies.
## Alternative analysis (‘ERR Effect’)

### Tests of $H_1$

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<th>%BONDS</th>
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<td></td>
<td>(-0.40)</td>
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<td>(-7.09)</td>
<td>*** (2.95) ***</td>
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<tr>
<td><strong>Post×TREAT</strong></td>
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<td></td>
<td>(0.43)</td>
<td>*** (-5.66) ***</td>
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</table>

- **Controls**: Yes, Yes
- **Industry Fixed Effects**: Yes, Yes
- **Adjusted $R^2$**: 0.451, 0.147
- **N**: 328, 328
### Alternative analysis (‘ERR Effect’)

**Tests of H₂**

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<td>(2.38)**</td>
<td>(-0.14)</td>
<td>(1.51)</td>
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<td>(-2.01)**</td>
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<td>(-3.61)***</td>
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<td>(1.58)</td>
<td>(-4.32)***</td>
<td>(5.60)***</td>
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<td>(-7.01)***</td>
<td>(2.75)***</td>
<td>(-5.59)***</td>
</tr>
<tr>
<td><strong>Post×TREAT×PP_CHAR</strong></td>
<td><strong>-0.03</strong></td>
<td><strong>0.12</strong></td>
<td><strong>-0.10</strong></td>
<td><strong>0.07</strong></td>
</tr>
<tr>
<td></td>
<td>(-1.36)</td>
<td>(3.32)***</td>
<td>(-2.90)***</td>
<td>(1.39)</td>
</tr>
</tbody>
</table>

| Controls | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| Adjusted R² | 0.471 | 0.154 | 0.522 | 0.229 |
| N | 328 | 328 | 328 | 328 |
We study the ‘real’ effects of IAS 19R on pension asset allocations, given firms’ concerns about pension-induced equity volatility.

Findings are consistent with treatment firms significantly reducing (increasing) equities (bonds) in the pension asset allocation, relative to control firms, to mitigate the volatility-increasing effect of IAS 19R.

These inferences are maintained under several robustness tests.

Results differ from those in a concurrent Canadian study.

A limitation relates to self-selection into treatment.
We conduct an effects study motivated by the notion of evidence-based regulation

Importance of cost-benefit analysis (causal effects)
- Benefits: Extent to which decision usefulness increases
- Costs: Could include unintended 'real effects'

However, isolating (causal) effects of accounting standards is challenging:

**What helps:**
- Implementation that yields quasi-experimental setting (e.g., staggered adoption)
- Rigid disclosure requirements
- Better data availability (XBRL, or an EDGAR-like repository)

**What tends to hurt:**
- Accounting choices
- Options to early adopt
- Long lead times between publication of standard and effective date
Thank you