



# **Evaluating Accounting Information Systems that support Multiple GAAP Reporting using Normalized Systems Theory**

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# Overview

- Motivation
- Research question
- Methodology
- Theoretical Framework
- Combinatorial effects
- Conclusions – impressions – further research



# Motivation

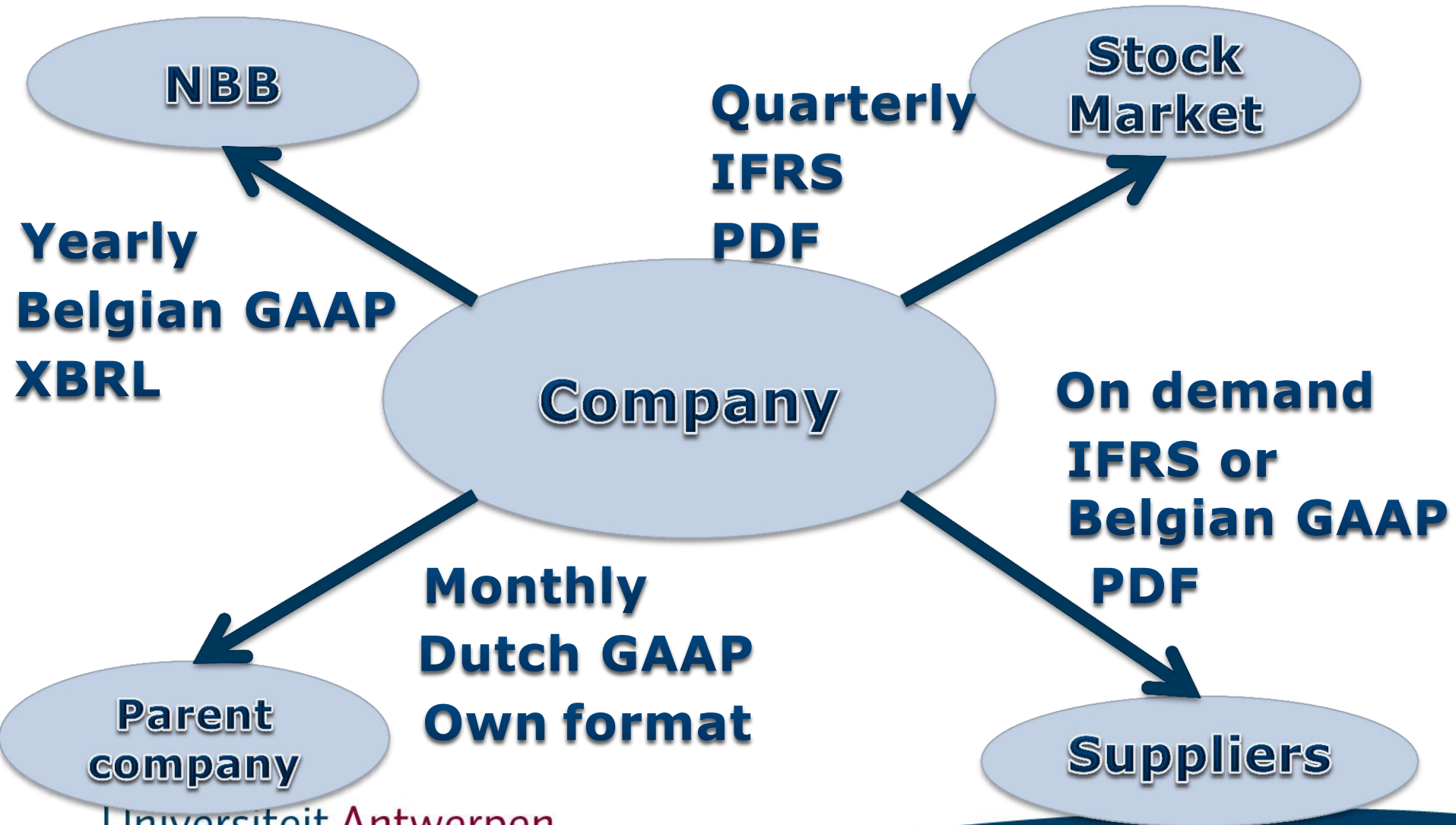
- Applying NS in a domain field

=> Accounting

- Data
- Processes
- NOT software

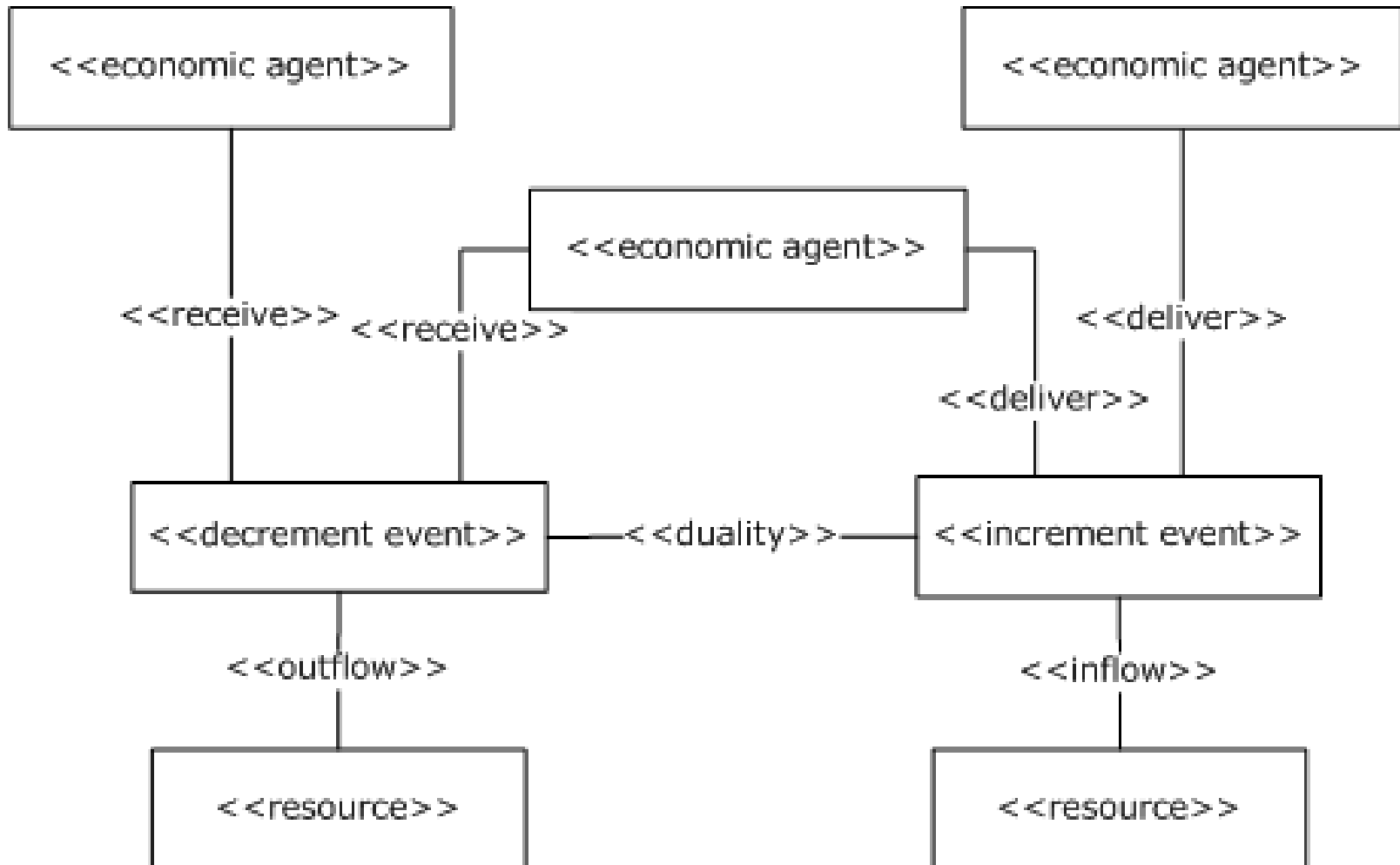


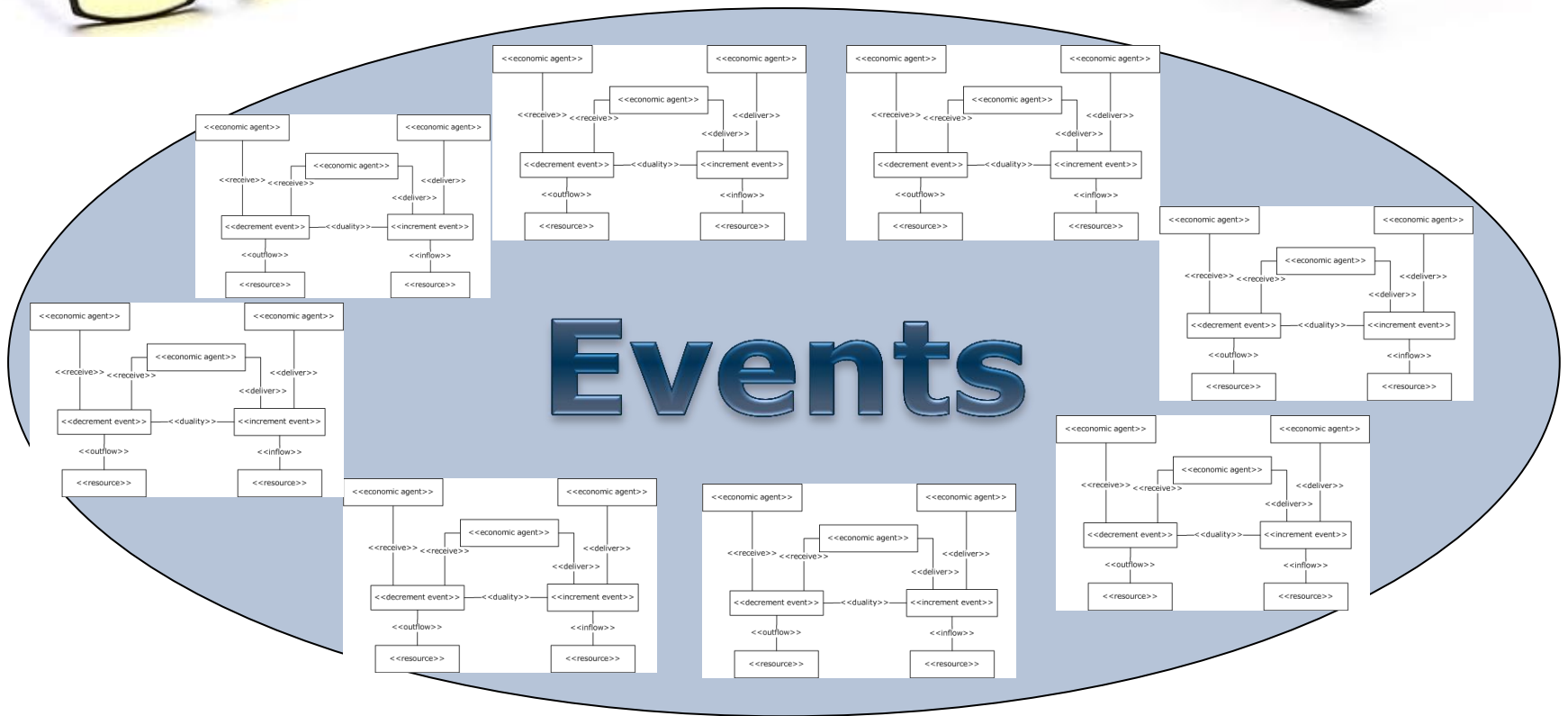
# Financial Information Needs





# The REA Model







# Research question

- Problem = multiple GAAP => evolvable AIS
- Which combinatorial effects are present in existing multiple GAAP AIS?



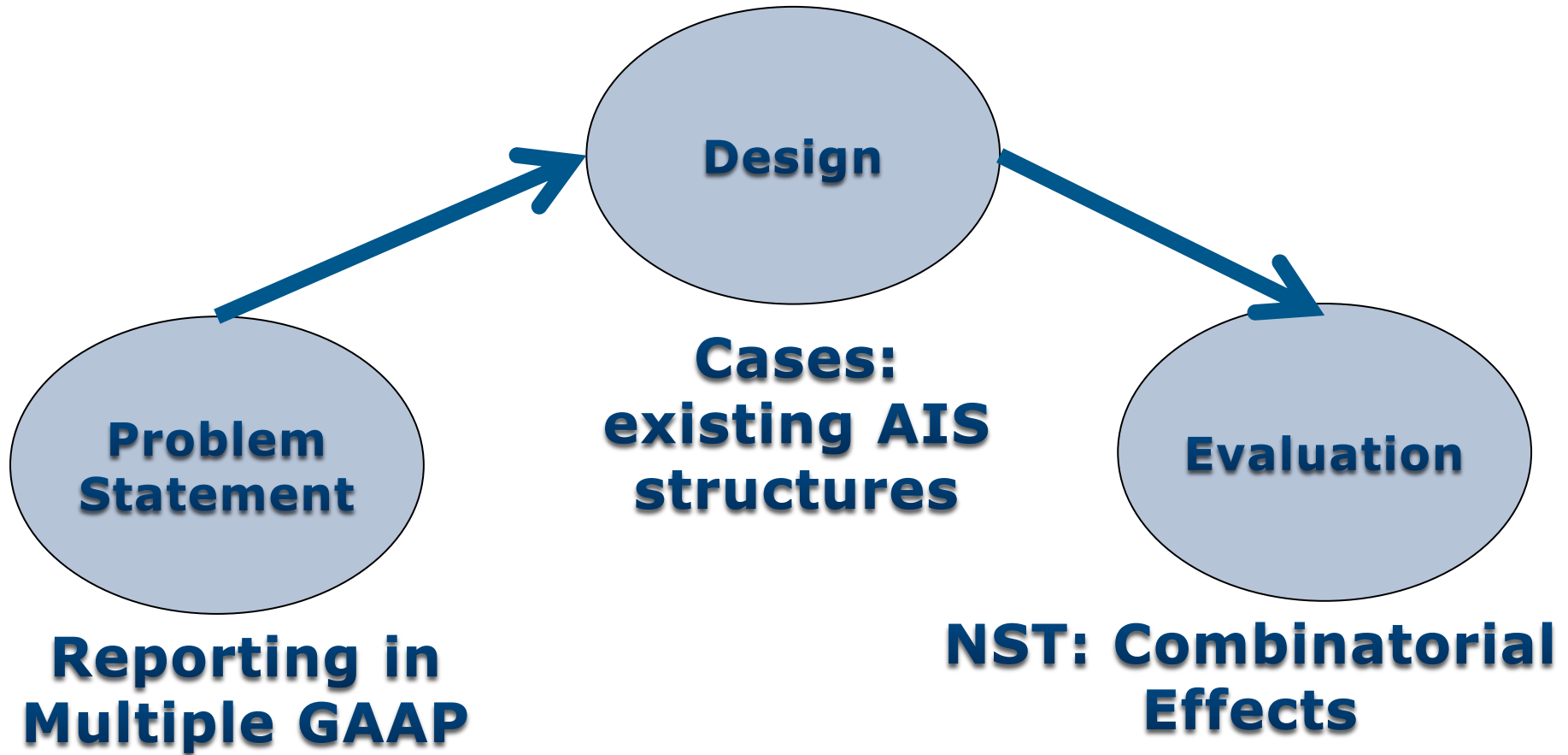
# Methodology

- Design science - iteration of design cycle:
  - Problem statement
  - Design
  - Evaluation
- Mixed methods:
  - Case studies in design phase



# Methodology

Mixed method: Design science - case studies





# Problem statement: Differences in GAAP

- Concepts
- Recognition criteria
- Measurement methods
- Presentation
- Disclosure
  
- Alternatives
- Lack of requirements



# Design: software designs in cases

- Accounts design
  1. Parallel accounts
    - a) Duplicated accounts
    - b) Area's
  2. Parallel ledgers
  3. Separate company code
- Posting design
  1. Difference posting
  2. Complete posting
  3. Special set-up (financial instruments)



**Chart of  
Accounts  
1**

**Chart of  
Accounts  
2**

**Company code 1**

**Ledger 1**

**Accounts**

**Ledger 2**

**Accounts**

**Company code 2**

**Ledger 1**

**Accounts**

**Ledger 2**

**Accounts**



Evaluation: NST  
-> combinatorial effects

## Combinatorial effect?

The impact of a change is not only dependent on the change itself, but also on the size of the system on which it is imposed.



# Evaluation: impact of changes

1. Creating additional account
2. New revenue recognition criterion (effect on postings)
3. New revenue recognition criterion (effect on modules)
4. New measurement criteria for all GAAP



# Change 1: Creating additional account

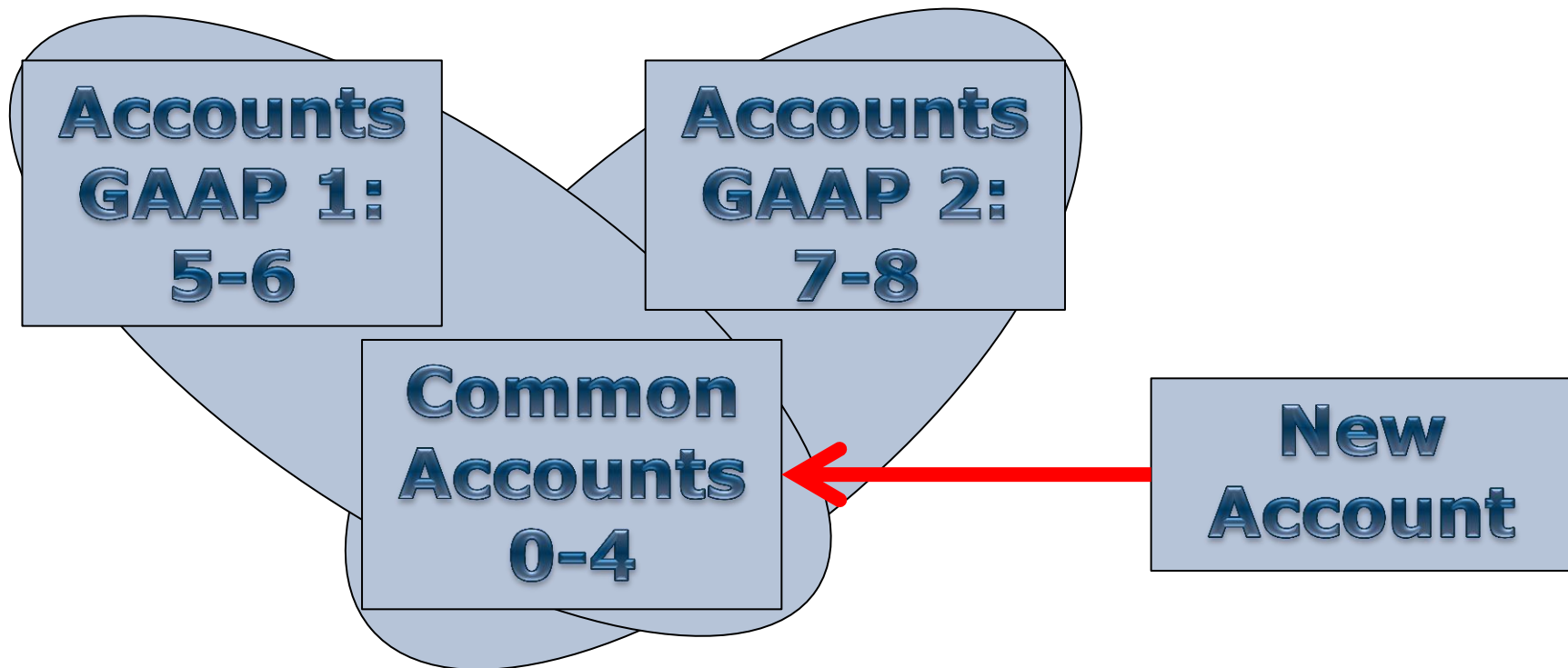
Parallel accounts: duplicated accounts





# Change 1: Creating additional account

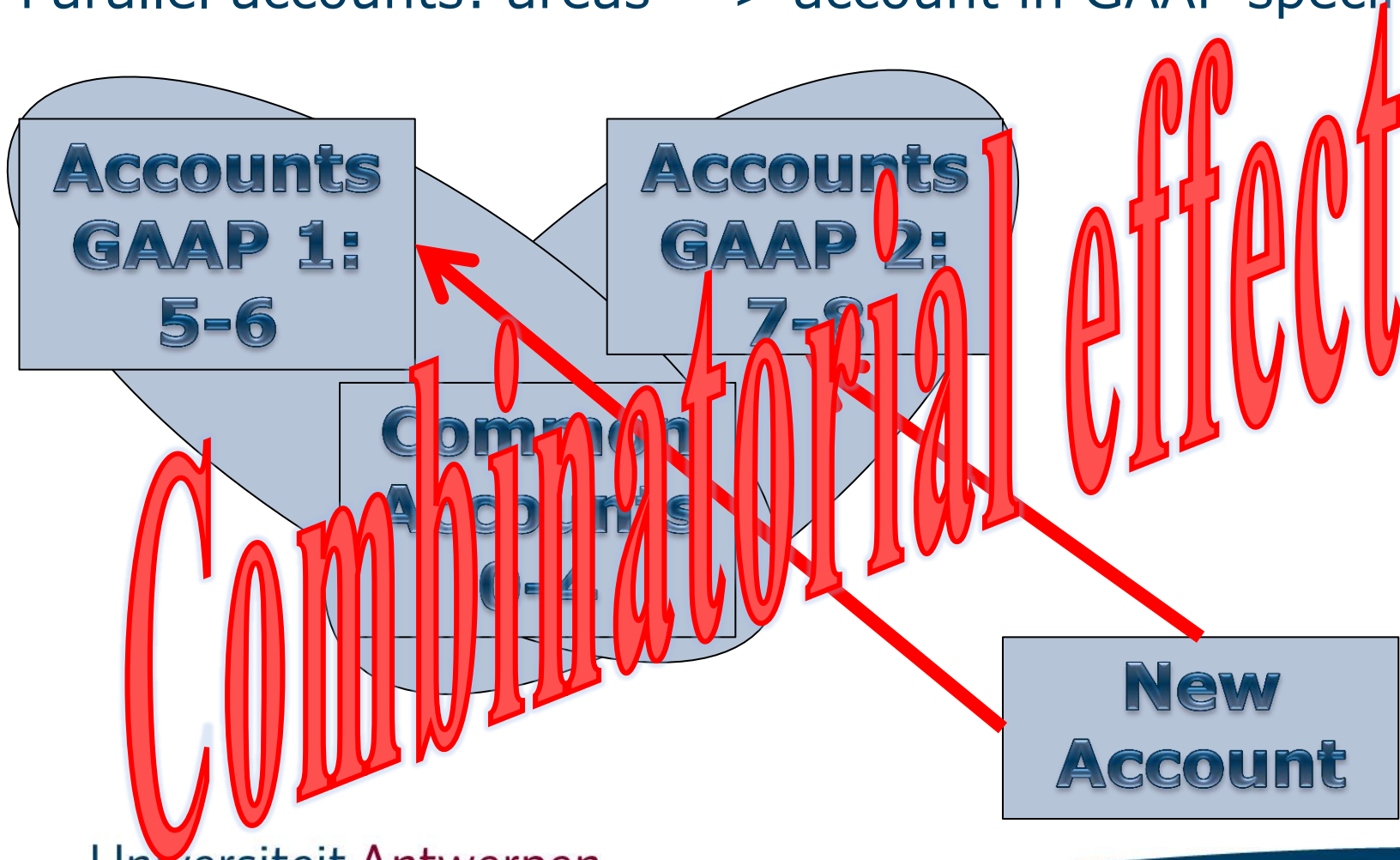
Parallel accounts: areas -> account in common area





# Change 1: Creating additional account

Parallel accounts: areas -> account in GAAP specific area





Cha

**New Account**

Creating additional account

**Chart of Accounts**

- Parallel ledgers

**Chart of Accounts**

**Ledger GAAP 1**

**Ledger GAAP 1**

**Ledger GAAP 2**

**Ledger GAAP 4**

**Chart of Accounts**

**Chart of Accounts**

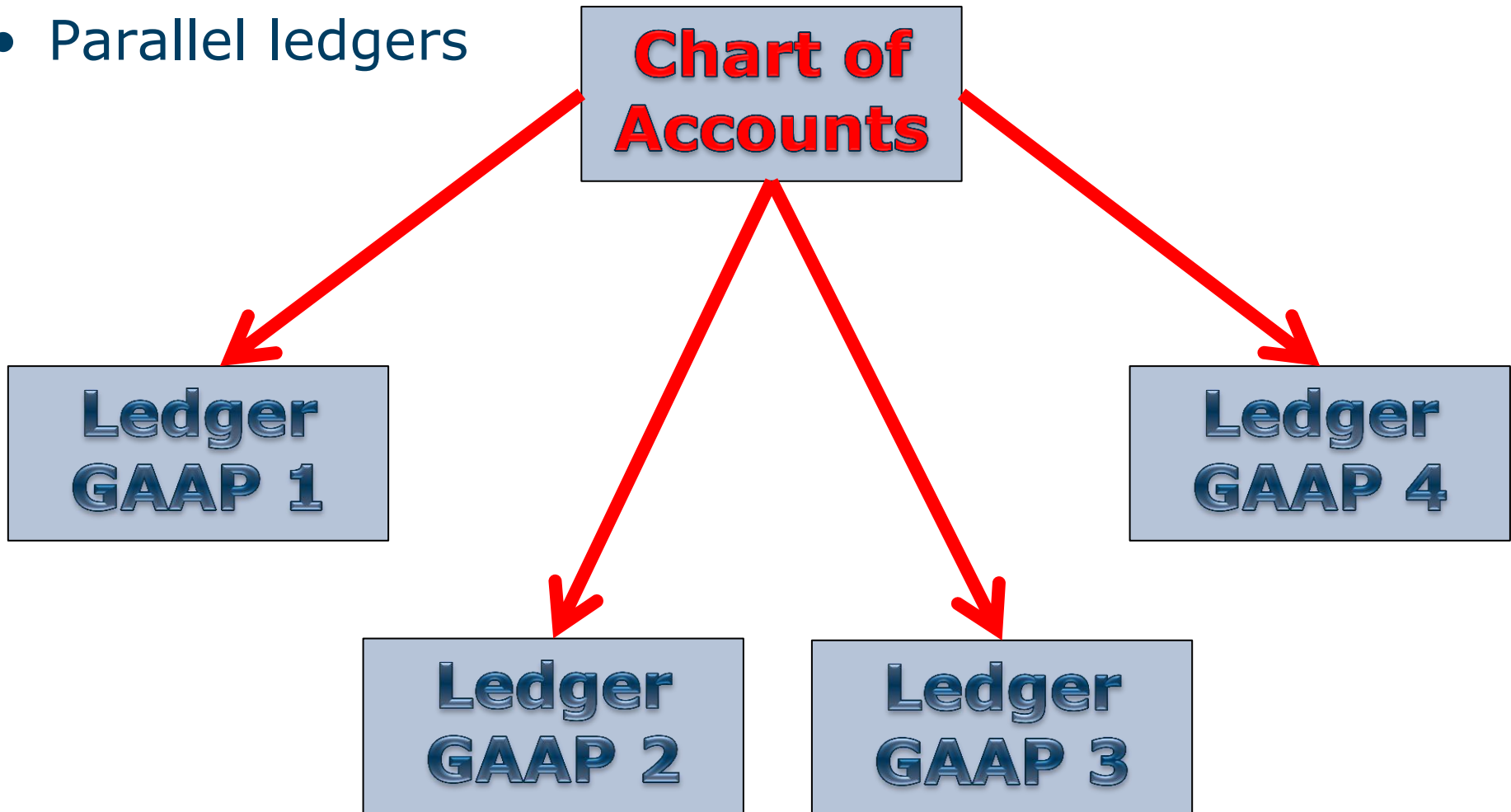
*Combinatorial effect*

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# Change 1: Creating additional account

- Parallel ledgers





Cha

**New Account**

Creating additional account

**Chart of Accounts**

Separate company code = CC

**Chart of Accounts**

**CC GAAP 1**

**CC GAAP 2**

**CC GAAP 3**

**CC GAAP 4**

**Chart of Accounts**

**Chart of Accounts**

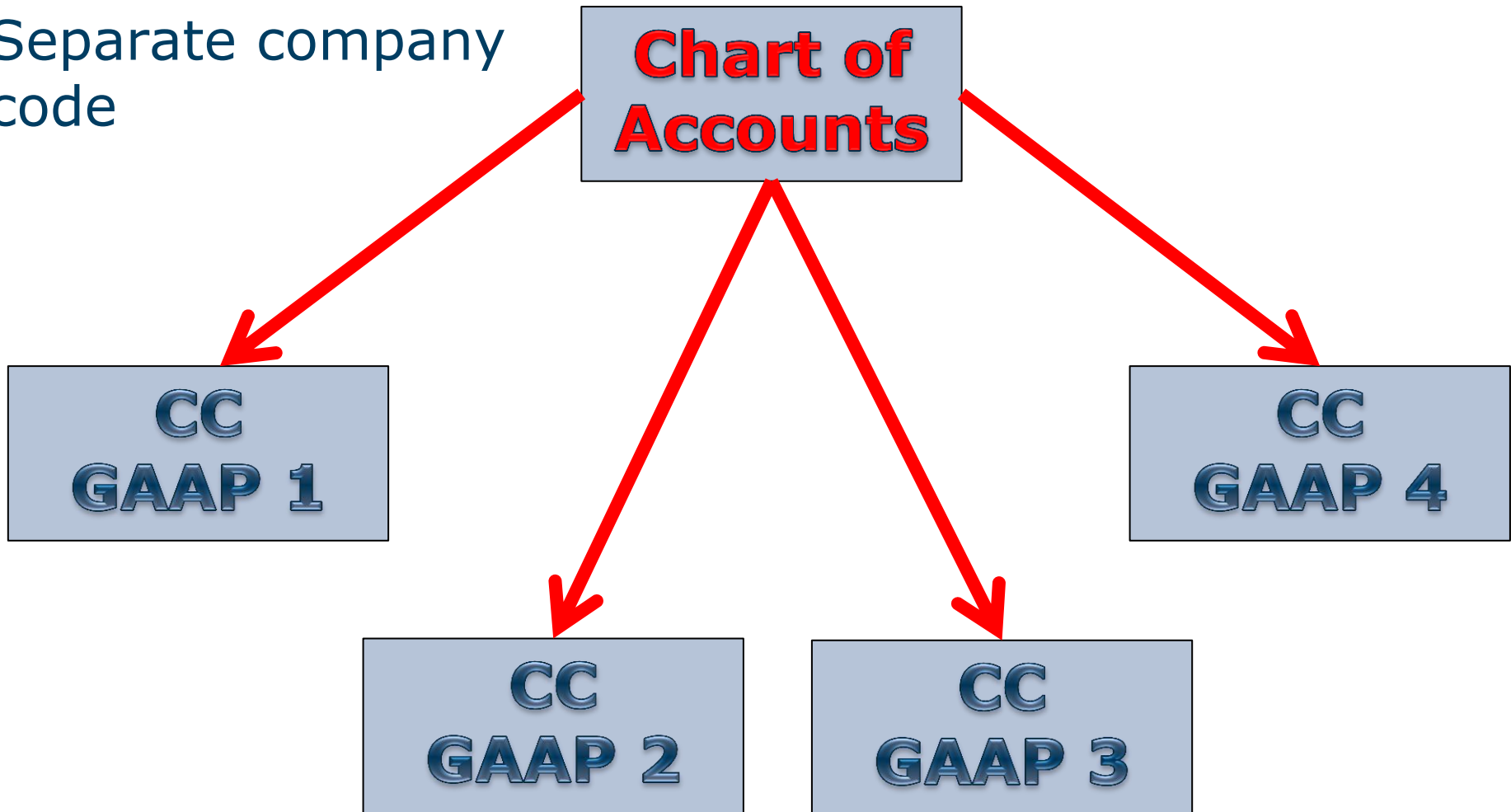
*Combinatorial effect*

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# Change 1: Creating additional account

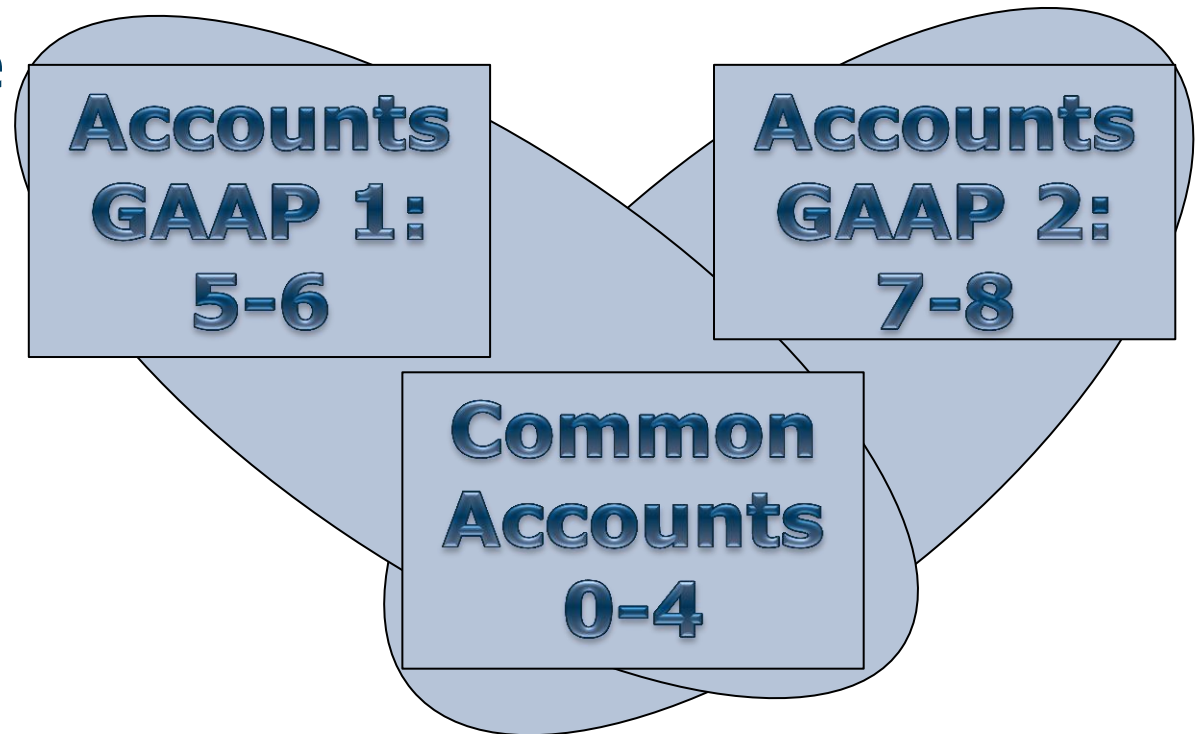
Separate company code



# Change 2: Revenue recognition criteria (effect postings)

Parallel accounts areas:

A) past revenue recognition criteria the same for all GAAP

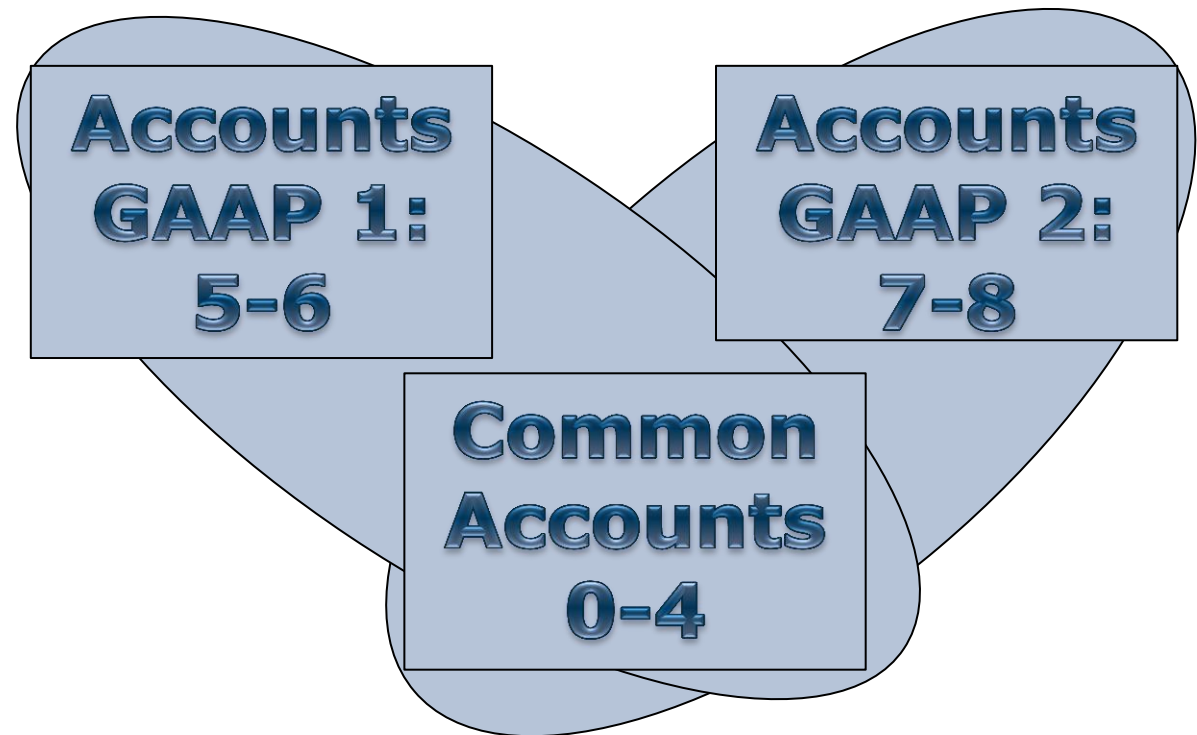


⇒ Impact the same as change 1

# Change 2: Revenue recognition criteria (effect postings)

B) primary and other GAAP already had different criteria

=> No CE





# Change 2: Revenue recognition criteria (effect postings)

Parallel accounts...

Difference posting

**Event**

**Cash 500  
@ Revenu 500**

**Trade receivables 500  
@ Revenu 500**

**GAAP 1**

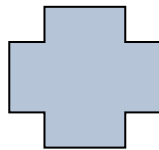
**Ledger  
GAAP 1**

**Revenu 500  
@ Trade receivables 500**

**Cash**

**GAAP 2**

**Ledger  
GAAP 1**



**Ledger  
GAAP 2**

**Realization**



# Change 2: Revenue recognition criteria (effect postings)

Parallel accounts...

Difference posting

**Trade receivables 500**

**@ Cash 500**

**@ Revenue 500**

**@ Trade Receivables 500**

**Event**

**Revenue 500**

**@ Trade receivables 500**

**GAAP 1**

**Realization**

**Ledger**

**GAAP 1**

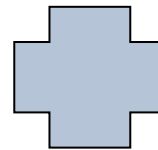
**Trade receivables 500**

**@ Revenue 500**

**GAAP 2**

**Cash**

**Ledger**  
**GAAP 1**



**Ledger**  
**GAAP 2**

*Combinatorial effect*



# Change 2: Change revenue recognition criteria

Parallel accounts...

Complete posting



**GAAP 1**

**Realization**

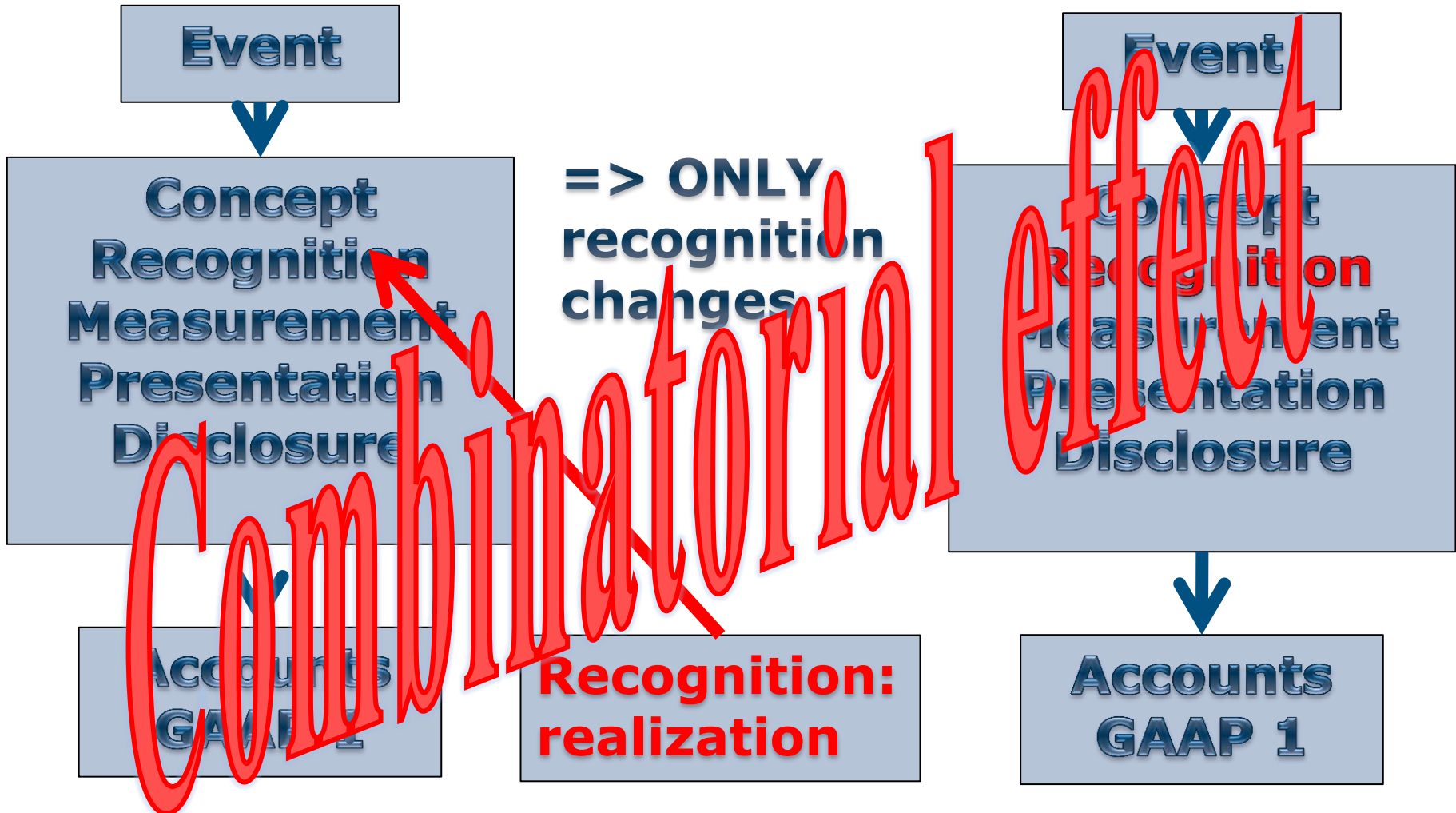
**Ledger  
GAAP 1**

**GAAP 2**

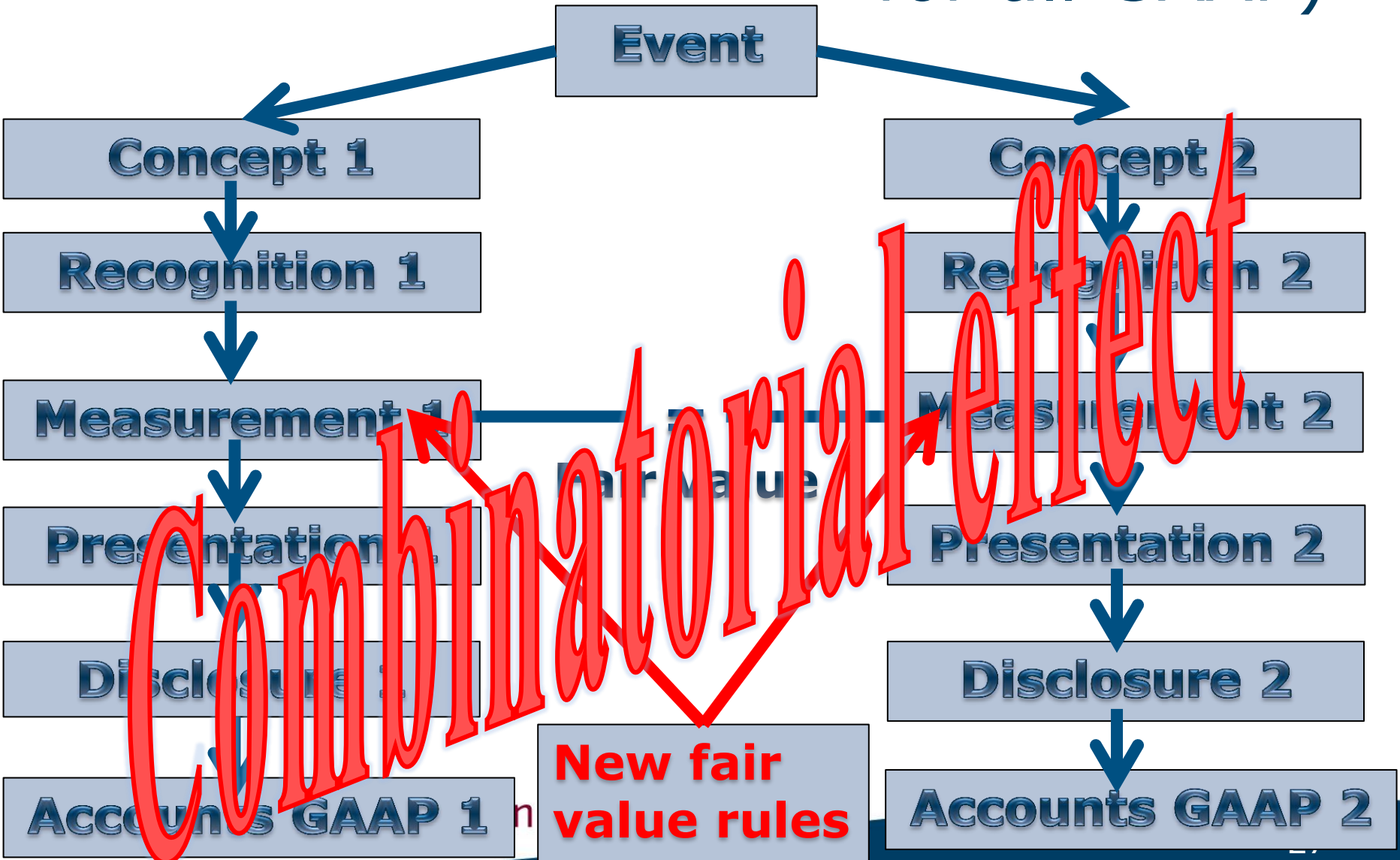
**Cash**

**Ledger  
GAAP 2**

# Change 3: Revenue recognition criteria (effect on modules)



# Change 4: Measurement criteria for all GAAP





# Conclusions

- Use of design science + case studies
- Identified combinatorial effects
- First evolvability study in AIS
- Usefulness of NST in domain specific area



# Impressions...

- Finding CE possible?

YES

- Omnipresent!
- Difficult to isolate!
- Where to start?
- Fundamental problems with accounting structures?



# Further Research

- Formulate Guidelines
- Build prototype



**Thank you for your  
attention!**

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**Questions?**