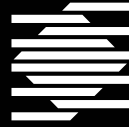




Institute
and Faculty
of Actuaries

Munich RE



GIRO Conference 2022

21-23 November, ACC Liverpool

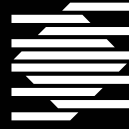
#GiroConf22





Institute
and Faculty
of Actuaries

Munich RE



The value of ERM

A study of Lloyd's of London

Khon Quang
Capital Actuary
Great Lakes – Munich Re

#GiroConf22

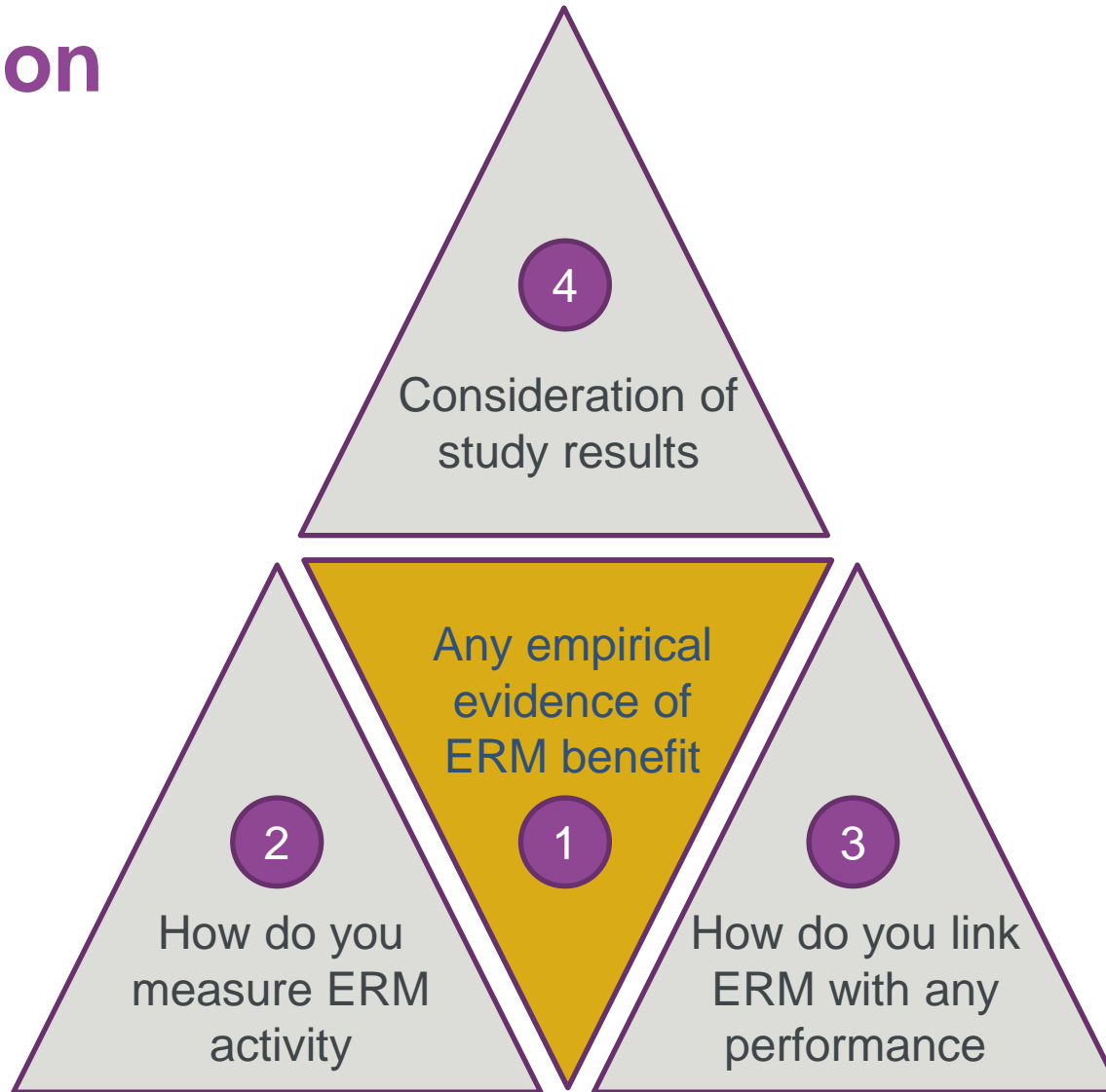


What and why is ERM relevant

- Also known as ‘group’, ‘integrated’ or ‘consolidated’ risk management
- Activities that enable ERM:
 - Executive engagement
 - Perform aggregation of risk across legal entities
 - Execute strategic risk allocation and transfers
 - Make informed decisions at group level



Motivation



Results from my study paper
*“Value of ERM:
A study of Lloyd’s of London”*
– Quang

Study results

What is the ERM impact on performance ?

- To best of my knowledge, empirical research about Lloyd's has not been done before
- Study results:
 - Coefficient of ERM variable: **+8.6%**
 - Statistical significance **@ 1% level**
 - Solid results based on **robustness & scenario tests**
- For syndicates exhibiting high level of ERM activity
- 'Return on Assets' as measure of performance

*Based on empirical finding,
using regression testing*

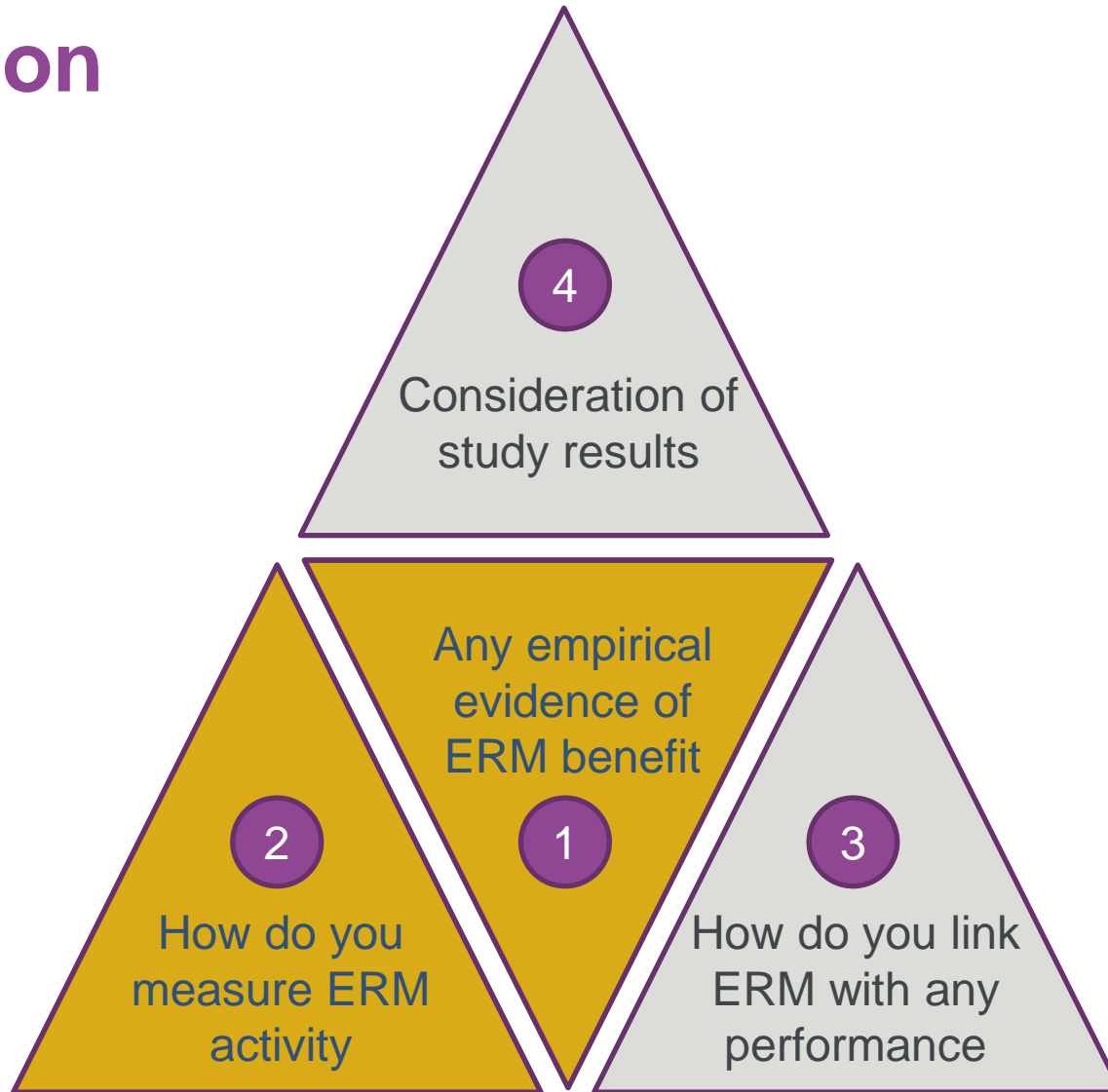
Compared to existing ERM research

Author	ERM impact on Response variable
Farrell and Gallagher	+0-1%
Ai et al	+3-4%
Baxter et al	+22%
Lin et al	-5%
Hoyt and Liebenberg	+20%
Gordon et al	Match of share price and ERM factors

Lloyd's study shows
+ 8.6% ERM activity to
contribute to performance

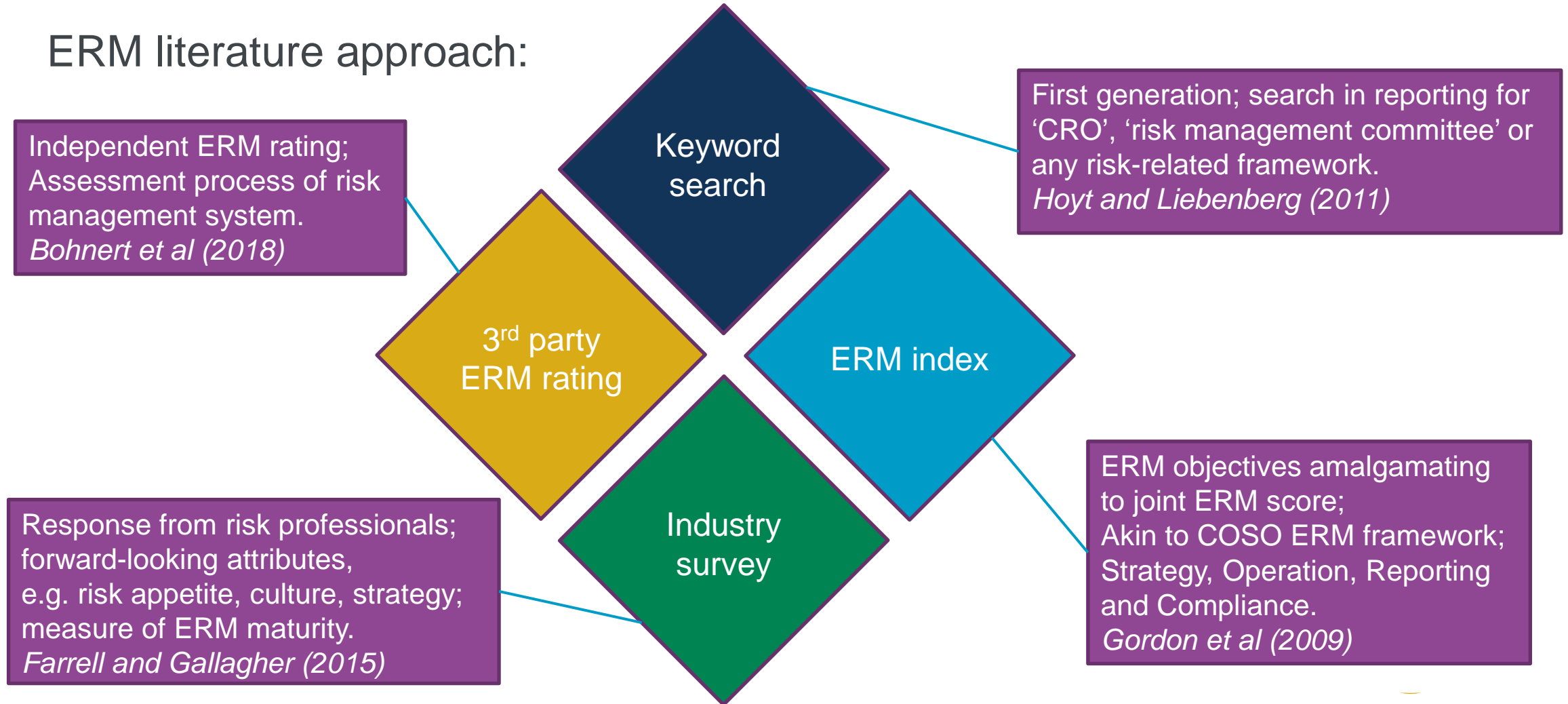
* Tobin's Q = (MV of equity + Book Liabilities) / Book Assets

Motivation



'Measure' of ERM activity

ERM literature approach:



Lloyd's-specific ERM index

- My study follows approach of ERM index
- Broadly based on COSO ERM framework (2004)
- My Lloyd's study specification of ERM activity measurement:

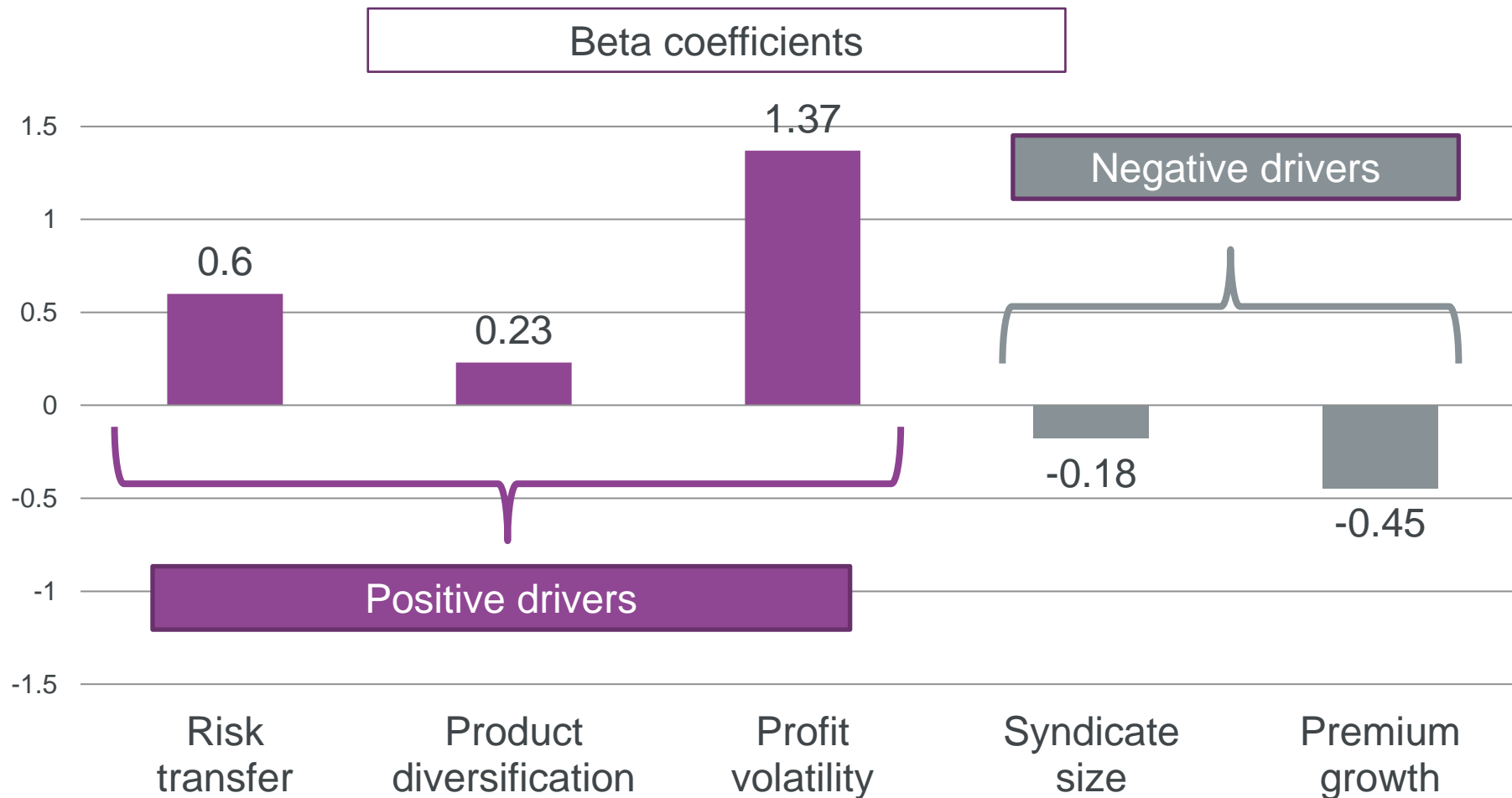
ERM index = directors' tenure
+ strategy
+ operations
+ compliance



- Ensure business **continuity**
- Increased **accountability** of long-term strategy
- **Oversight** of risk culture

Study results

What are the main drivers of ERM activity ERM_{it}^* ?



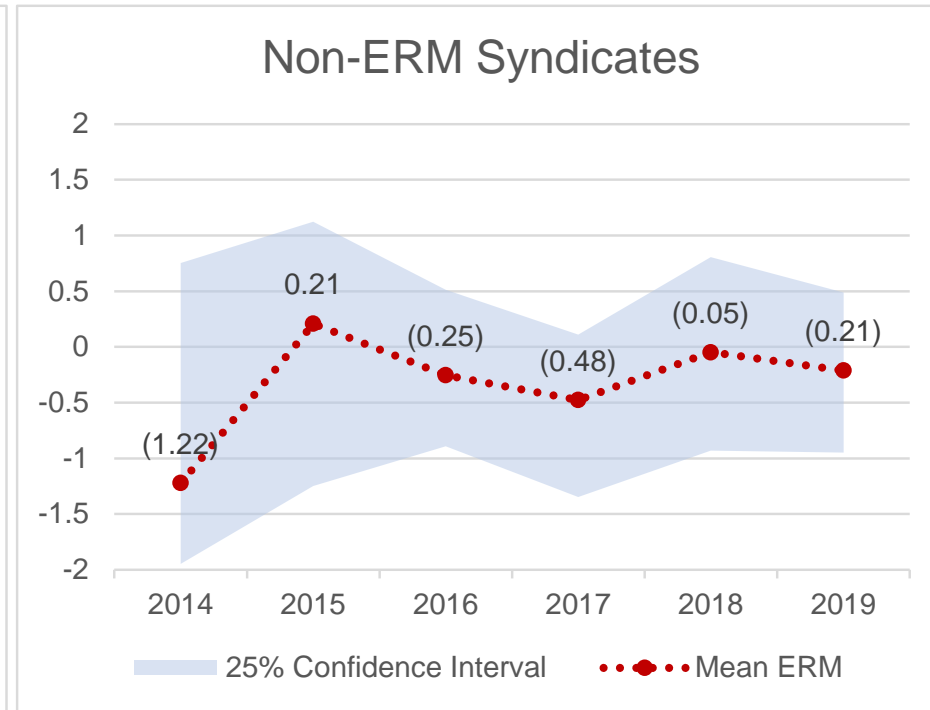
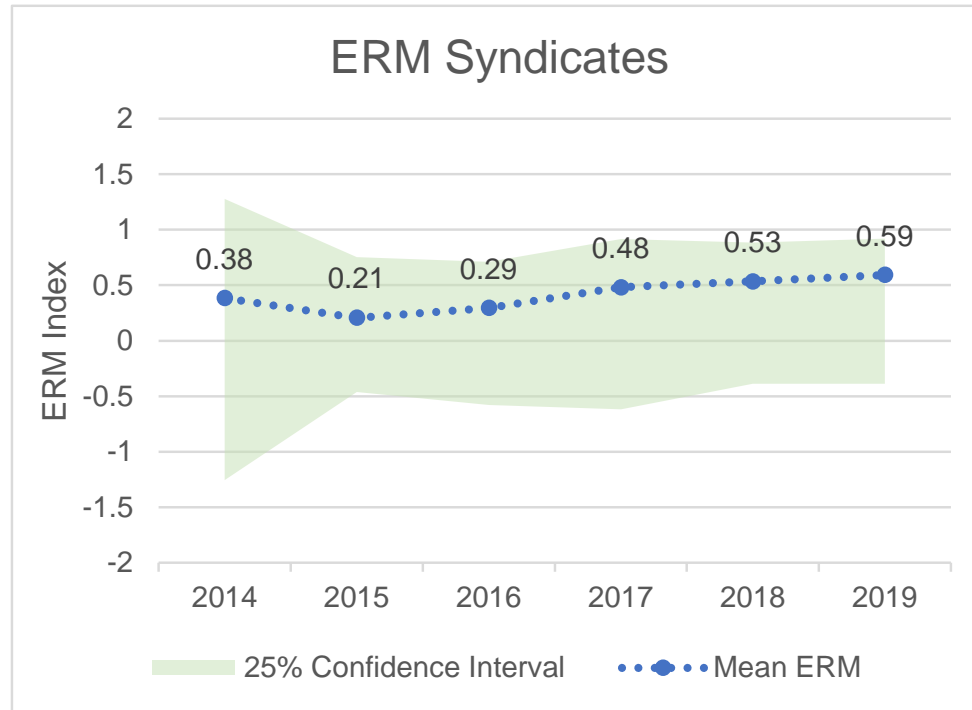
All drivers of ERM are statistically significant @ 1% level



Institute
and Faculty
of Actuaries

Trend of ERM index

- ERM syndicates = syndicates with high level of ERM activity



Observation

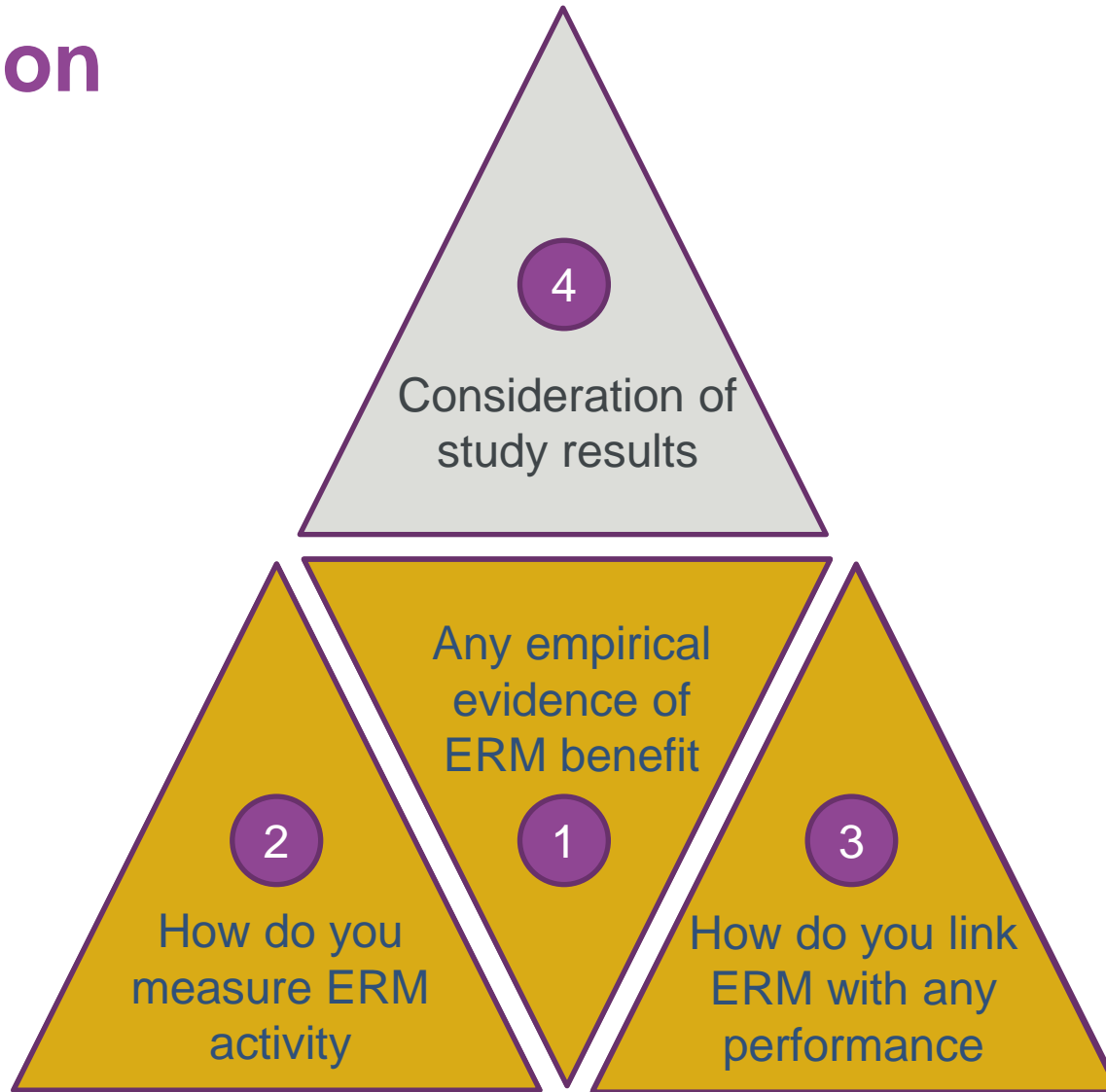
- Consistent upward trend
- Stable variability

Munich RE



Institute
and Faculty
of Actuaries

Motivation

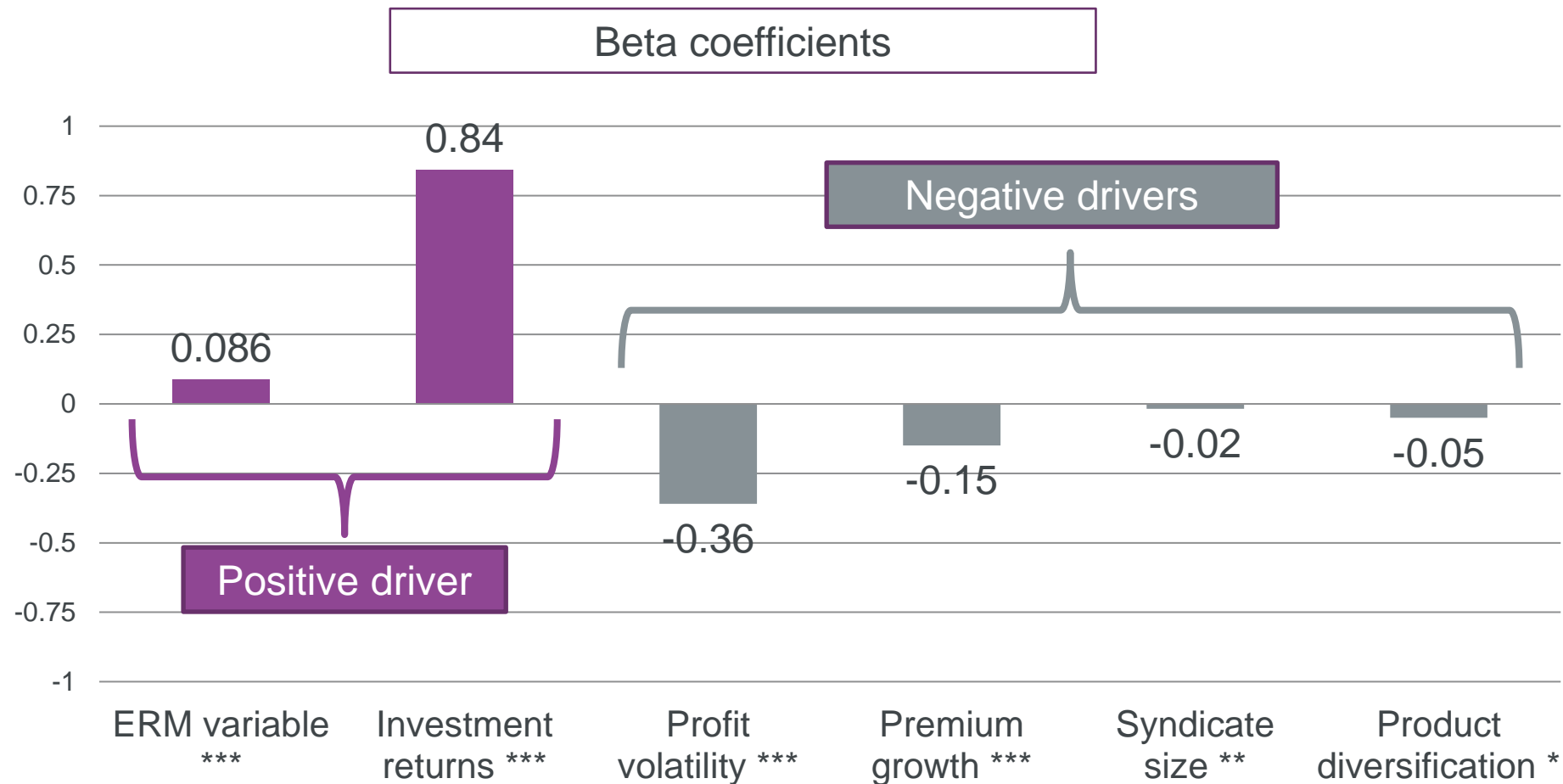


Study methodology

- Apply a 2-step least-squares regression
 - ERM Equation: $ERM_{it}^* = \sum \beta^s x_{it}^s + \epsilon_{it}^s$
 - Performance Equation: $P_{it} = \sum \beta^o x_{it}^o + \theta ERM_i + \epsilon_{it}^o$
- where $ERM_i^* = 1$ if the threshold $\sum_t ERM_{it}^* > 1$ applies and $ERM_i = 0$ otherwise, for syndicate i and year t . ϵ^s and ϵ^o are error terms, normally distributed with mean 0 and variances of 1 and σ^2 , respectively, and covariance ρ . P_{it} is defined as the 'Return on Assets'.
- Study approach consistent with majority of ERM studies

Study results

What factors influence performance P_{it} ?

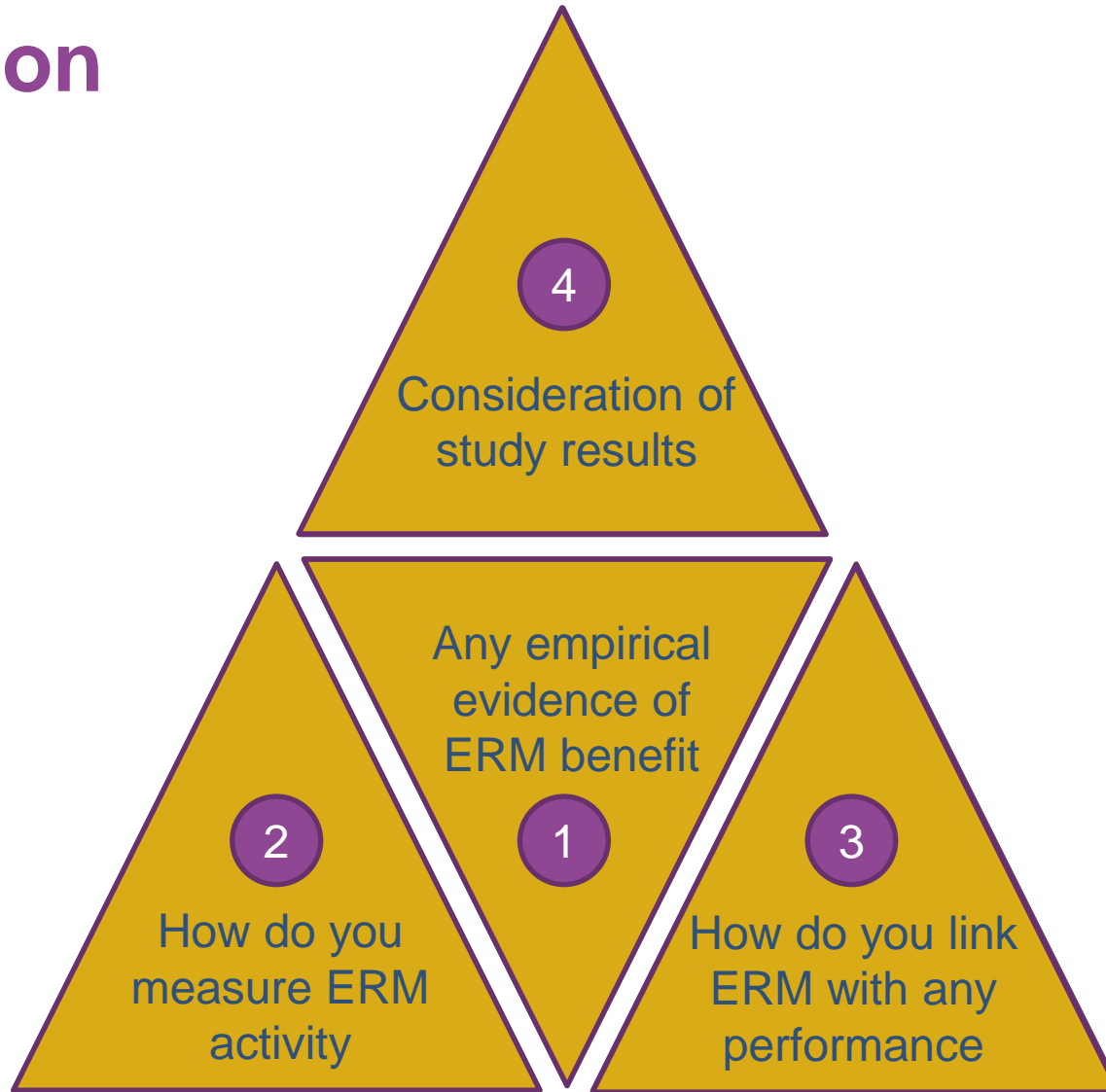


Statistical significance denoted by *, **, and *** for 10%, 5% and 1% level, resp.



Institute and Faculty of Actuaries

Motivation



Consideration of Lloyd's study results

1.) Data + Model specification

Sensitivity to:

- how data is presented
- choice of model parameters
- Correlation of variables (multi-collinearity)

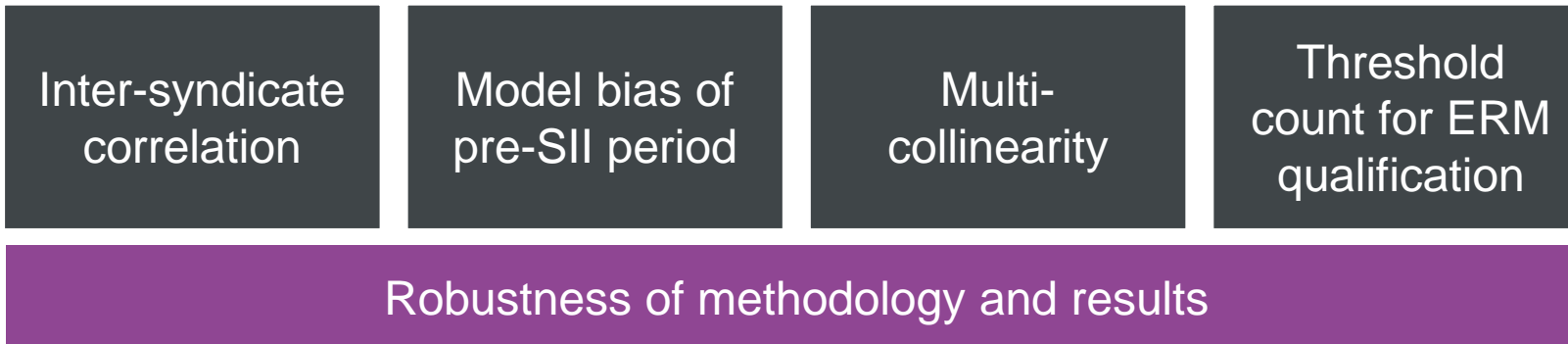
2.) ERM research

If study is compared to ERM research, we need to understand:

- ERM measure
- Segment and scope
- Purpose of study

1.) Data + Model specification

- Need for further investigation for the purpose of:
 - Improve understanding of methodology
 - Test variability of results
 - Assess needs for further adjustments
 - Gain credibility of model choice and results
- Identified major areas of testing:



2.) ERM research

Author	Measure of ERM	Sample	Response variable	ERM impact on Response variable
Farrell and Gallagher	Industry survey	Worldwide corporates	ROA	+0-1%
Ai et al	S&P rating	US private insurers	ROA	+3-4%
Baxter et al	S&P rating	US public banks and insurers	ROA	+22%
Lin et al	S&P rating	US public GI insurers	ROA	-5%
Hoyt and Liebenberg	Keyword search	US public insurers	Tobin's Q*	+20%
Gordon et al	ERM index	US public insurers	Share price	Match of share price and ERM factors

* Tobin's Q = (MV of equity + Book Liabilities) / Book Assets

My ERM study
Lloyd's-specific ERM index
+ 8.6% ERM → ROA

Some factors to consider

Prioritise before drawing
comparison of ERM impact

What does it all mean for actuarial community

Promote further
ERM research

Seek more
empirical
evidence
e.g. alternative
ERM measure
for Lloyd's

Mindful of
research trend

Numerous topics:

- non-financial sectors,
- developing countries,
- sustainability impact

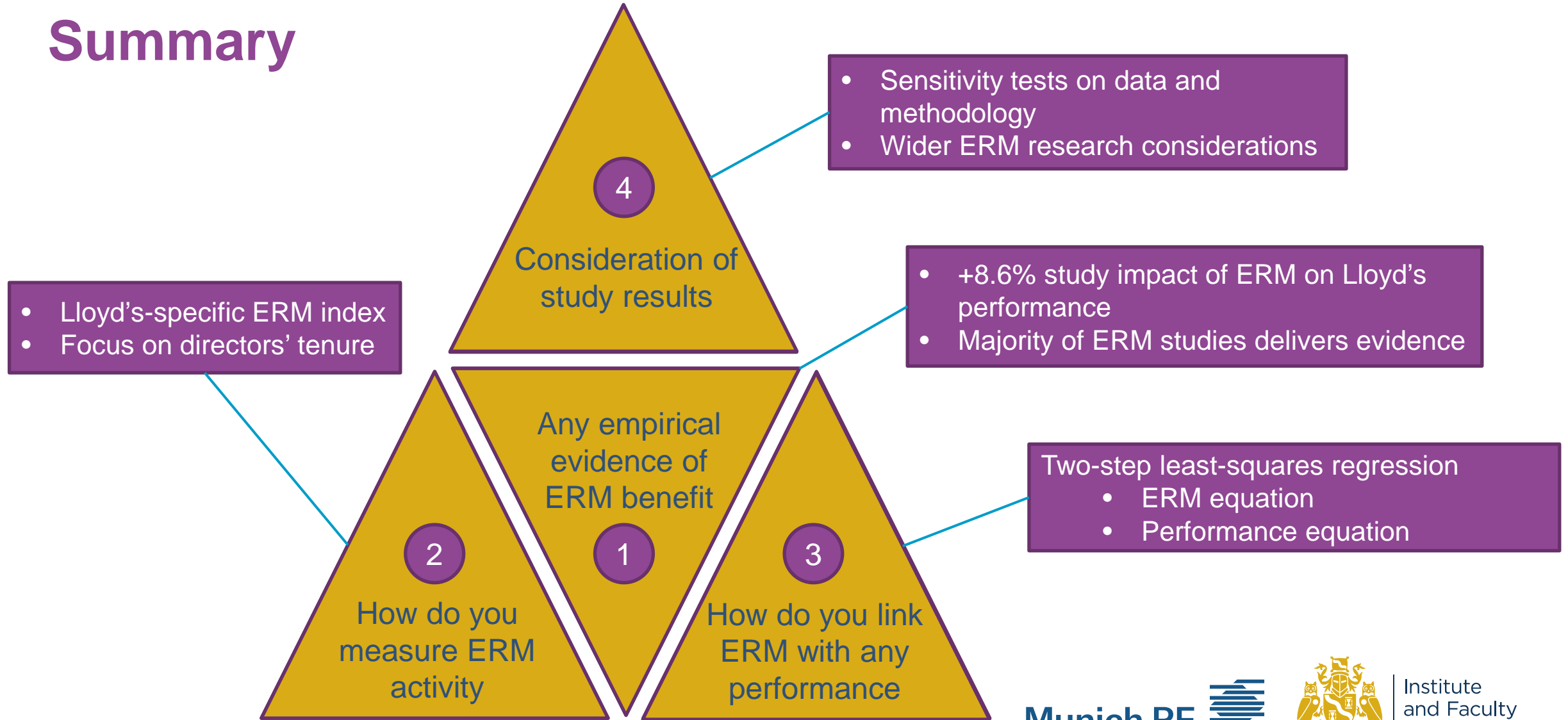
ERM foundation for
sustainability

- Sustainability and Climate change frameworks
- Governance with risk management

Continue actuarial
contribution

- Leverage research findings
- Ongoing actuarial involvement

Summary



Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



Institute
and Faculty
of Actuaries

Thank you

#GiroConf22

