A Text-Mining Approach to Navigate the Effects of Arab Revolutions on Moody's Rating Scrutiny Patterns in the MENA Region

An ECES Study

ECES
المركز المصري للدراسات الاقتصادية
The Egyptian Center for Economic Studies

Agenda

Rating Agencies: Role and Rules

A Novel Approach to Explore Rating Scrutiny

Investigating the Information Content of Moody's Reports

Scrutiny Patterns Under the Lens of Mixed-Effects Models

Policy Takeaways and the Way Forward

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Rating Agencies: Role and Rules

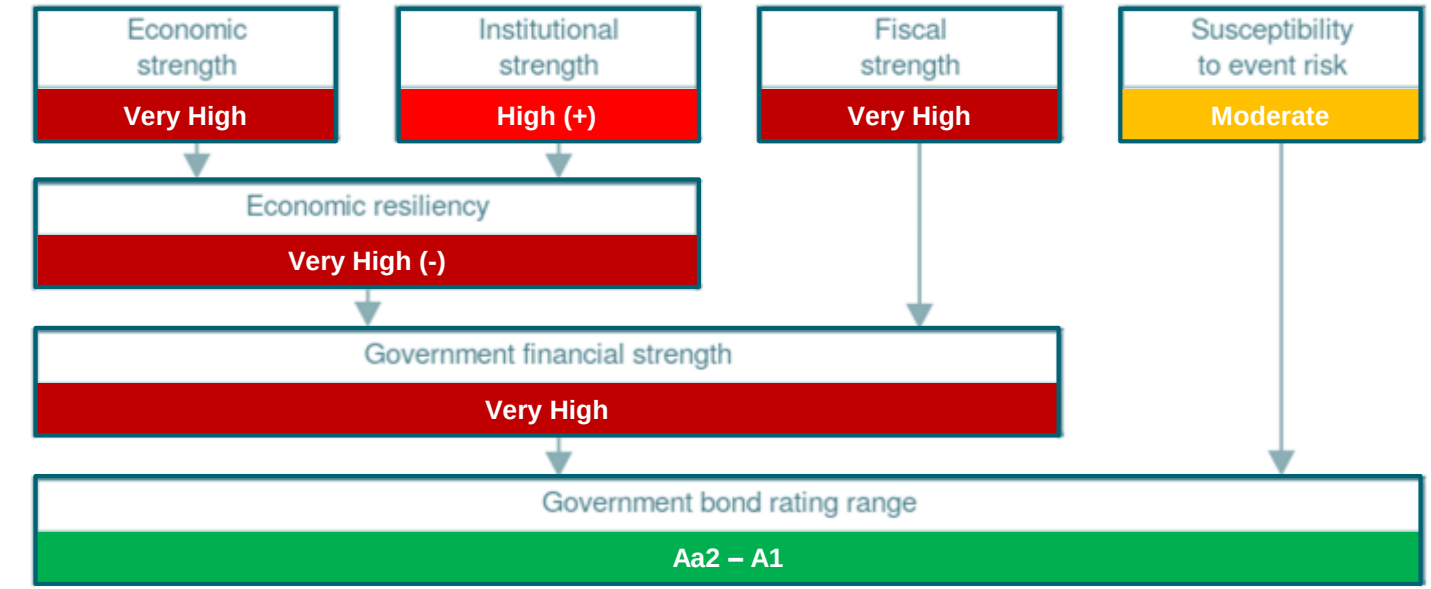
CRAs play **a decisive role** in determining the borrowing costs in financial markets through the ratings they produce.

Despite their announced methodologies, **empirical evaluation receipt of CRAs is still not entirely uncovered.**

Rating Rules: Reading from an Open Book

Example:

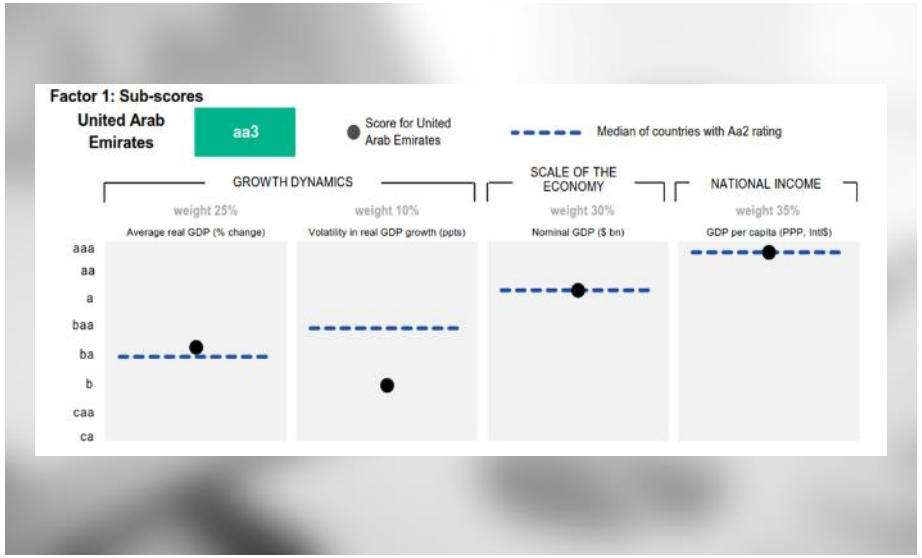
United Arab Emirates' credit profile is determined by four factors



Source: Moody's Investors Service

- As per its rating manual, Moody's depend on four sub-factors when assessing sovereign ratings.
- Empirically, economic and fiscal factors are given more weight than political and social factors.

Striking Balance: Not all Pages are Alike!



Economic and fiscal outcomes:
simple to measure, evaluate and communicate with markets.

Political and social choices:
mostly indirect, uncertain and long-term in nature.

The question of how CRAs scrutinize various rating developments remains without answers.

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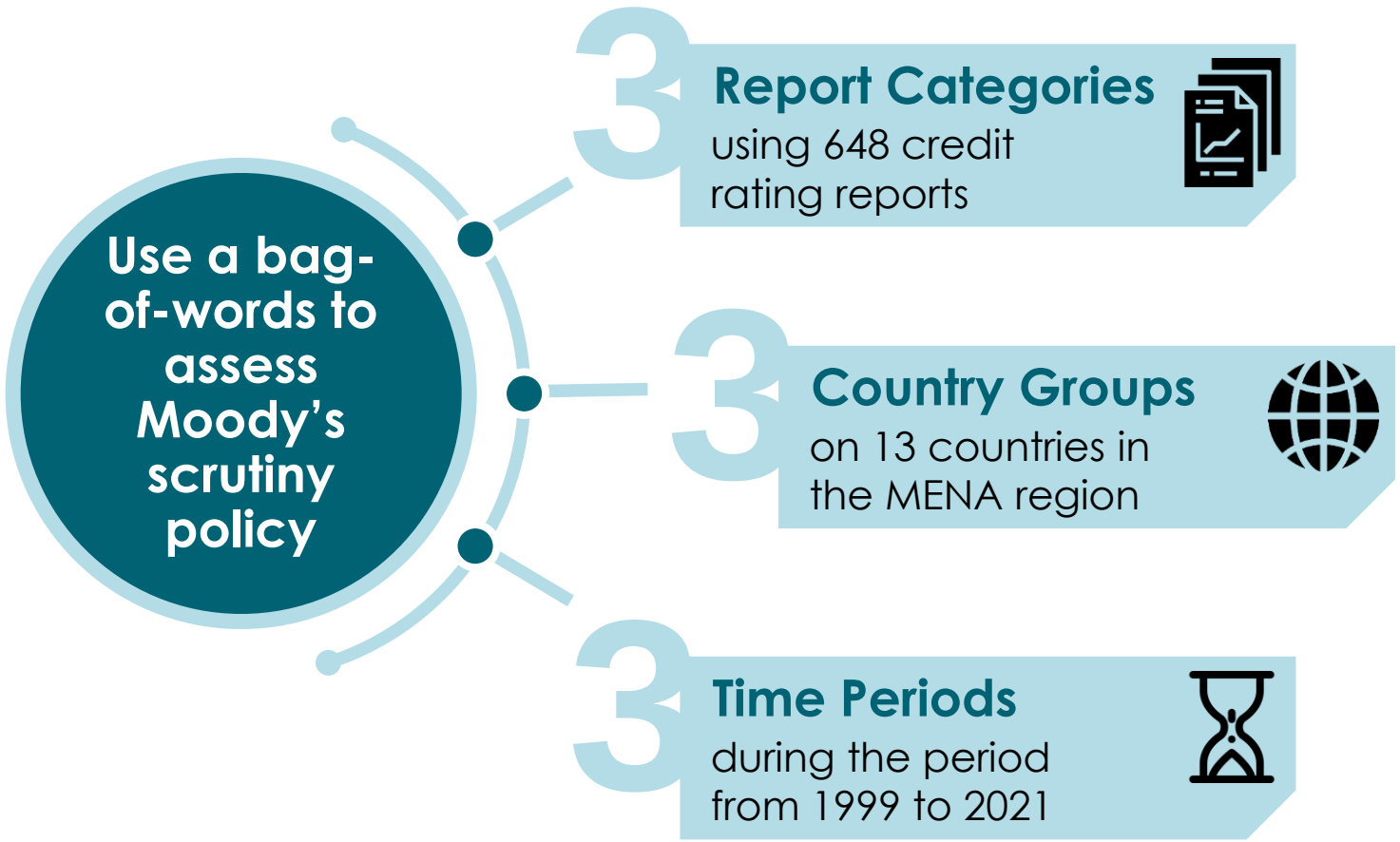
A Novel Approach to Investigate Rating Scrutiny

- A bag-of-words approach to agnostically assess empirical scrutiny policy of CRAs.
- Measuring scrutiny by counting the term frequency related to various topics within Standard and Poor's (S&P) reports.
- Measuring scrutiny across country groups in Europe and relative to financial crisis.

This paper in a nutshell



Rating Reports: The Untapped Treasure!

Rating reports provide **plethora of information** on how CRAs make, justify and disseminate their decisions.

Using detailed rating comments can **cleanly disentangle weight of qualitative rating factors**, such as political & social issues.

Reports are **widely observed and quoted** by policymakers, markets and press.

Reports are not only reliable and influential but also **forward-looking feedback channel.**

Green Tunisia as an Example

Year	No. of Reports	Economic	Fiscal	Politics	Social	Sectoral	Change in Distribution	Score
2000	1	0.54	0.21	0.14	0.07	0.04	--	Baa2
2002	1	0.55	0.25	0.05	0.07	0.08	--	Baa3
2004	1	0.49	0.21	0.11	0.06	0.13	--	Baa3
2005	1	0.48	0.21	0.13	0.06	0.12	--	Baa2
2011	2	0.38	0.14	0.38	0.06	0.05	(++)	Baa3
2012	3	0.32	0.17	0.38	0.04	0.09	--	Baa3
2013	4	0.27	0.18	0.48	0.03	0.04	--	Baa3 - Ba2
2014	3	0.23	0.16	0.52	0.03	0.06	--	Ba3
2015	4	0.32	0.17	0.39	0.03	0.08	(+)	Ba3
2016	7	0.36	0.20	0.32	0.05	0.06	--	Ba3
2017	6	0.40	0.22	0.25	0.06	0.06	--	B1
2018	6	0.44	0.24	0.21	0.05	0.05	--	B2
2019	5	0.36	0.18	0.34	0.08	0.05	(+)	B2
2020	6	0.41	0.23	0.25	0.07	0.04	--	B2
2021	7	0.41	0.20	0.27	0.08	0.04	--	Caa1

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Revolution has expanded Moody's coverage of rating events in Tunisia.

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Changes in scrutiny dist. as an early indicator.

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Exploring Information Content of Rating Reports

Use a bag-of-words to assess Moody's scrutiny policy

3 Report Categories
using 648 credit rating reports

3 Country Groups
on 13 countries in the MENA region

3 Time Periods
during the period from 1999 to 2021

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- 218 Credit Opinion
- 195 Issuer Comment
- 235 Issuer In-Depth

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HICs	UMICs	LMICs
Arab Emirates (AE) Bahrain (BH) Israel (IL) Kuwait (KW) Oman (OM) Qatar (QA) Saudi Arabia (SA)	Lebanon (LB) Jordan (JO) Iraq (IQ)	Egypt (EG) Morocco (MA) Tunisia (TN)

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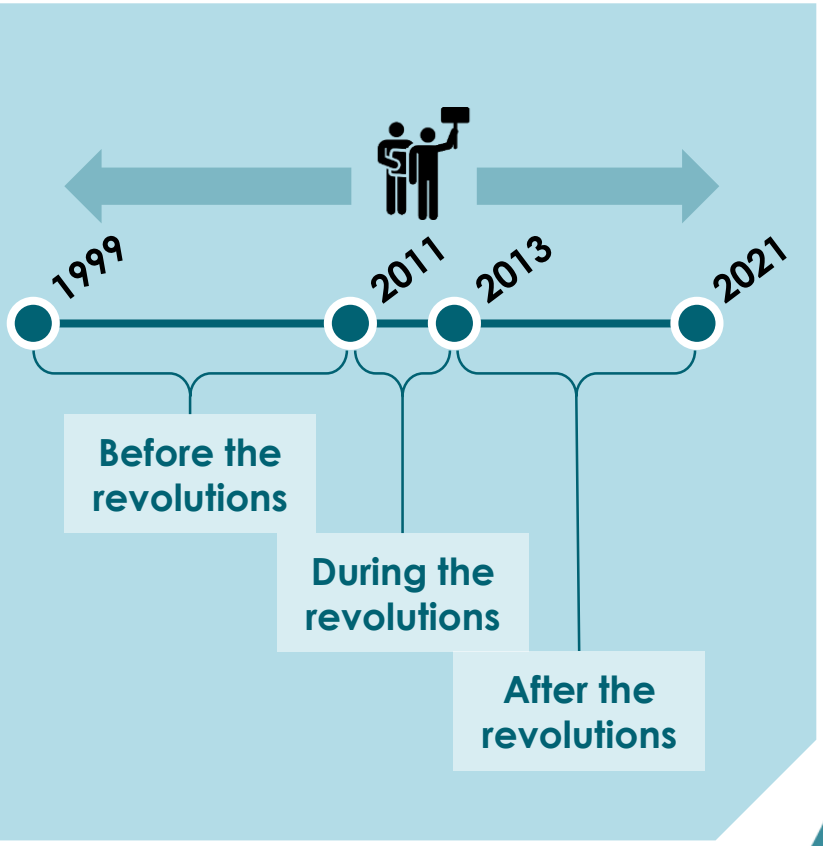
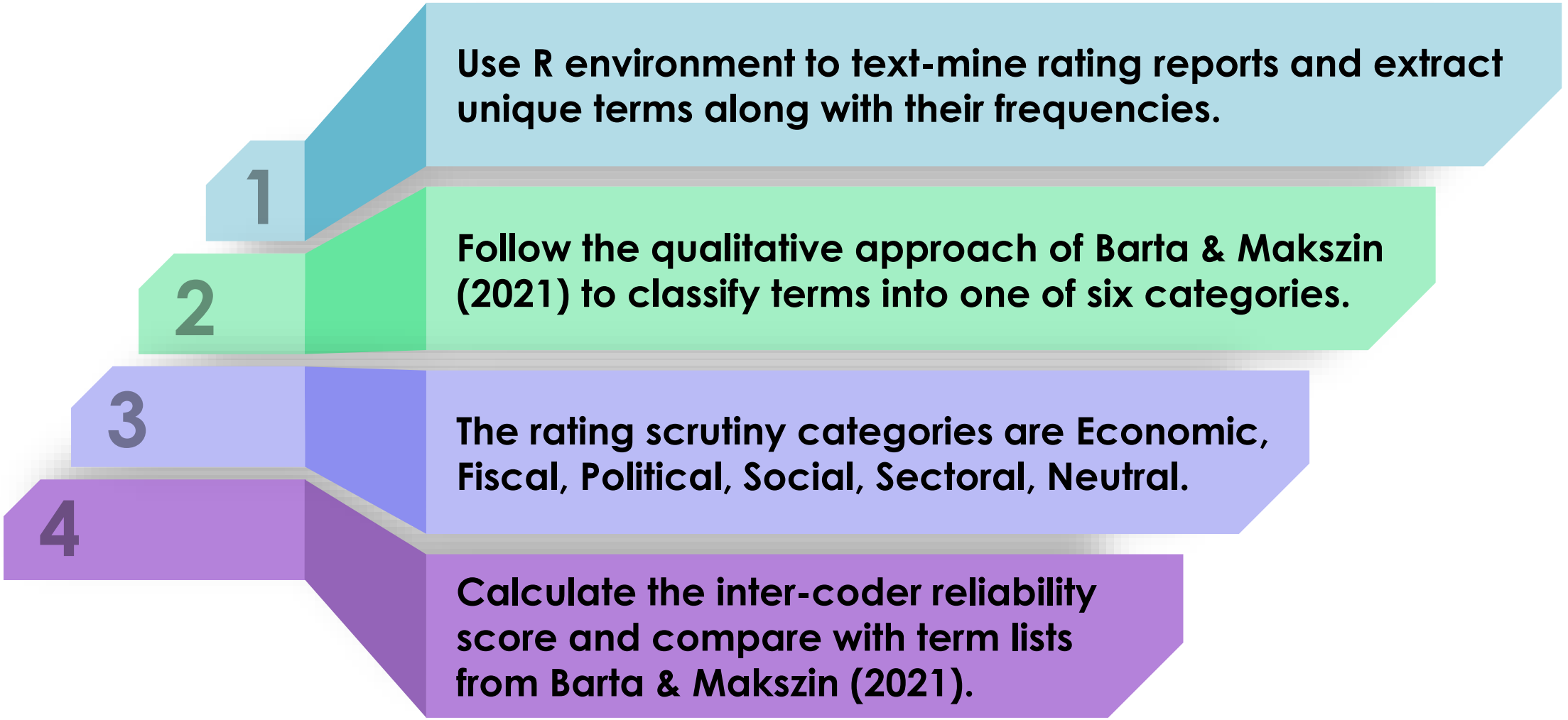


Bag-of-Words Approach in Steps

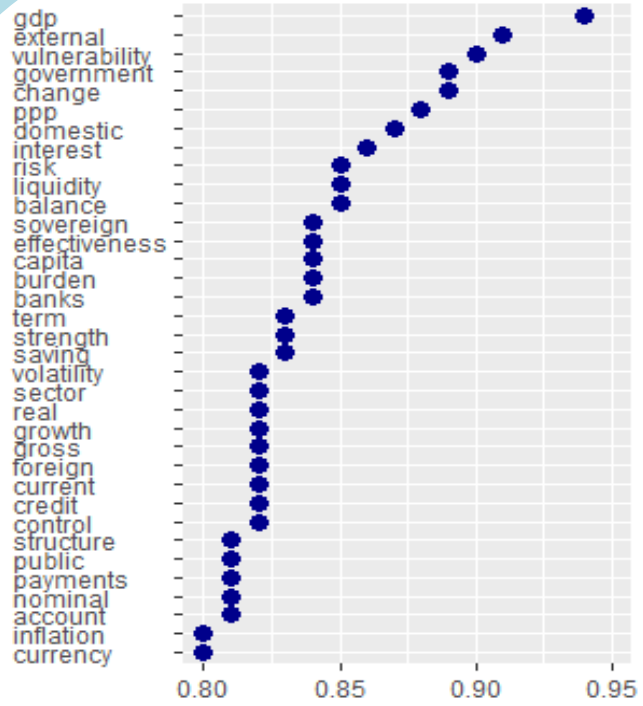


Our Bag-of-Words: Not Just Terms!

Word cloud of "Economics"

The economic list covers short- and Long-term economic issues

Correlations with "debt"

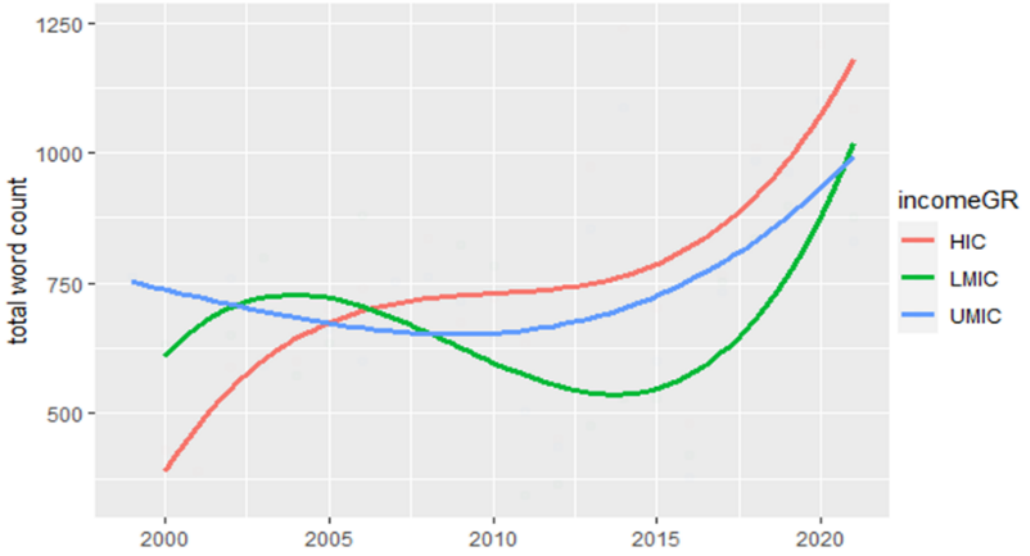


type (domestic vs external), Burden (interest and payment), management (vulnerability & risk)

Rating Scrutiny Patterns of the MENA

- Revolutions have significantly boosted Moody's rating scrutiny as indicated by growing rating report length.
- Cross-country differences still preserved with HICs receiving the most scrutiny and the LMICs getting the least.

- As Moody's main dish, economic and fiscal results account for two-thirds of its overall rating scrutiny of the MENA.
- Political and social terms are not only less scrutinized but also exhibit more variability with larger std. deviations.



Issue Area	Mean	Std. Deviation	Minimum	Maximum
Economics	39	09	08	66
Fiscal	24	07	01	58
Political	25	11	05	79
Social	04	03	00	49
Sectoral	08	05	00	43

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Scrutiny Patterns Under the lens of Mixed-Effects Models

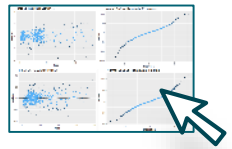
$$y_{ij} = \beta_0 + \beta_1 * (country-group)_{ij} + \beta_2 * (time-period)_{ij} + \beta_3 * (country-group * time-period)_{ij} + \beta_4 * (rating-outlook)_{ij} + \beta_5 * (report-type)_{ij} + \beta_6 * (word-count)_{ij} + \beta_7 * (sentence-count)_{ij} + v_{i1} + v_{i2} + \varepsilon_{ij}$$

- Unbalanced sample across countries and years.
- Capture heterogeneity across individual reports.
- Flexible empirical specification of fixed and random effects
- Establishing the direction and magnitude of the differences across categories.

Navigating Patterns of Moody's Rating Scrutiny

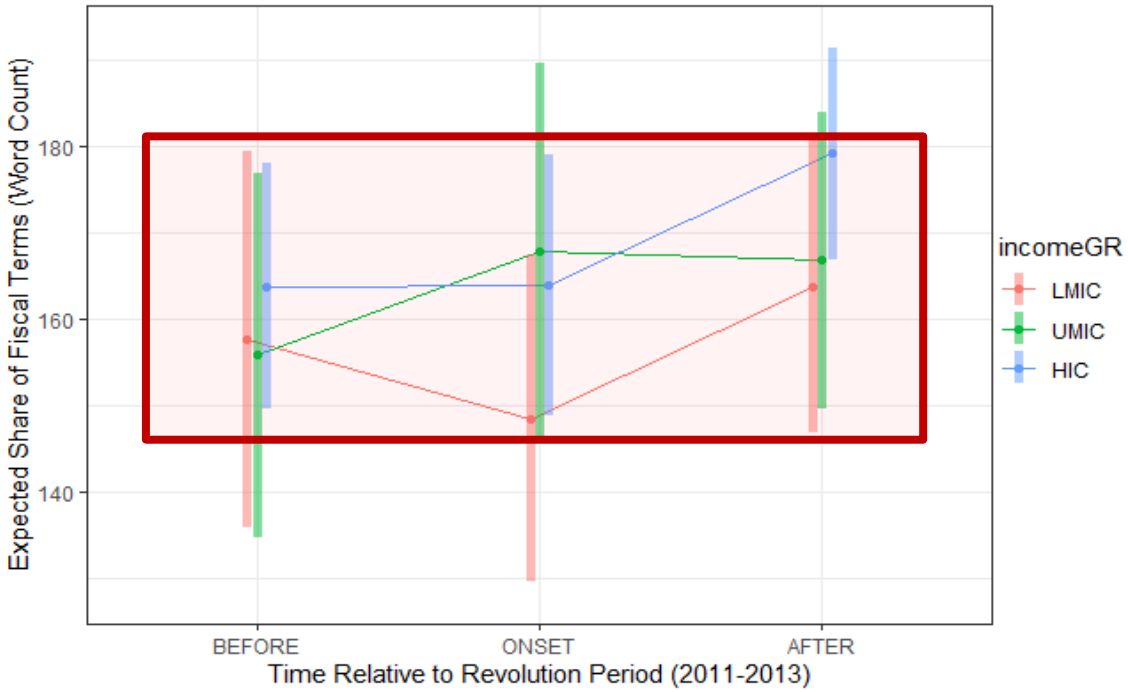
- Cross-category differences.
- Country-group differences.
- Time-specific differences.

	Dependent Variable		
	Economics	**Political**	**Social**
Fixed Effects			
Intercept	25.28* (10.74)	-41.60** (14.94)	29.35*** (5.45)
Country Group† (Base: LMIC)			
UMIC	-13.12 (13.51)	32.81 (20.45)	-19.01** (7.20)
HIC	-32.88** (11.38)	28.47 (17.18)	-20.04*** (5.98)
Time Period‡ (Base: Before Revolutions)			
Onset of Revolutions	-30.00** (9.86)	62.69*** (8.62)	-27.20*** (4.68)
After Revolutions	-21.77* (8.87)	31.79*** (7.71)	-27.41*** (4.17)
Interaction: Group*Period (Base: LMIC*Before Revolution)			
UMIC * Onset of Revolutions	-4.15 (14.07)	-34.28** (12.31)	16.77* (6.72)
UMIC * After Revolutions	4.70 (11.42)	-16.07 (9.95)	17.39** (5.39)
HIC * Onset of Revolutions	20.85 (11.56)	-49.38*** (10.09)	14.09* (5.47)
HIC * After Revolutions	14.58 (9.45)	-18.15* (8.17)	9.47* (4.42)



Moody's scrutinizes distinct rating developments relating to different issue areas differently.

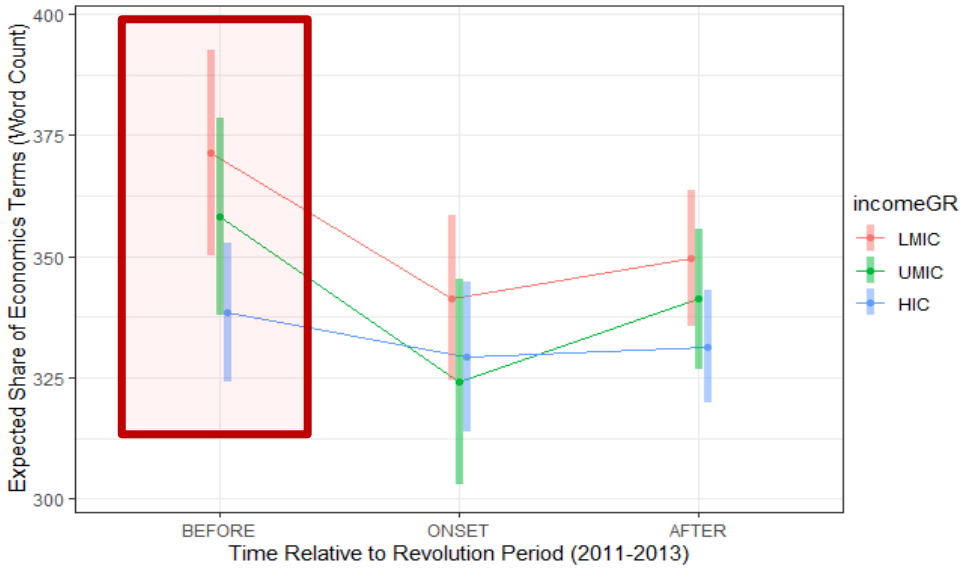
Fiscal Scrutiny as a Main Rating Dish



	Dependent Variable	
	Fiscal	**Sectoral**
Fixed Effects		
Intercept	1.78 (11.03)	-9.73 (9.64)
Country Group† (Base: LMIC)		
UMIC	-1.83 (14.63)	6.91 (13.17)
HIC	6.10 (12.26)	21.40 (11.06)
Time Period‡ (Base: Before Revolution)		
Onset of Revolution	-9.16 (8.44)	2.57 (5.68)
After Revolution	6.14 (7.60)	4.07 (5.12)
Interaction: Group*Period (Base: LMIC*Before)		
UMIC*Onset	21.21 (12.07)	2.23 (8.13)
UMIC*After	4.79 (9.80	-4.11 (6.59)
HIC*Onset	9.26 (9.90)	4.81 (6.66)
HIC*After	9.19 (8.07)	-9.45 (5.42)

Moody's scrutinizes distinct rating developments relating to different country groups differently.

Country Club Matters After All!



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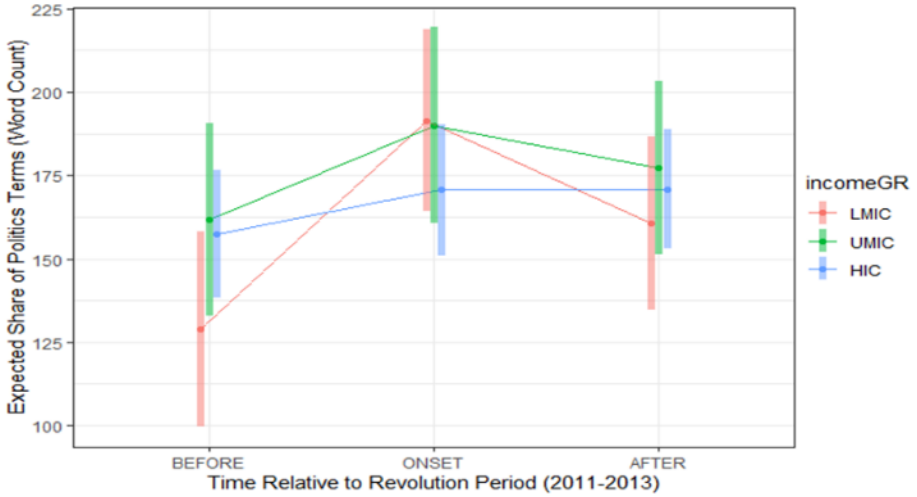
Moody's scrutinizes distinct rating developments relating to different issue area and country groups differently over time.

Revolutions as a Game Changer!



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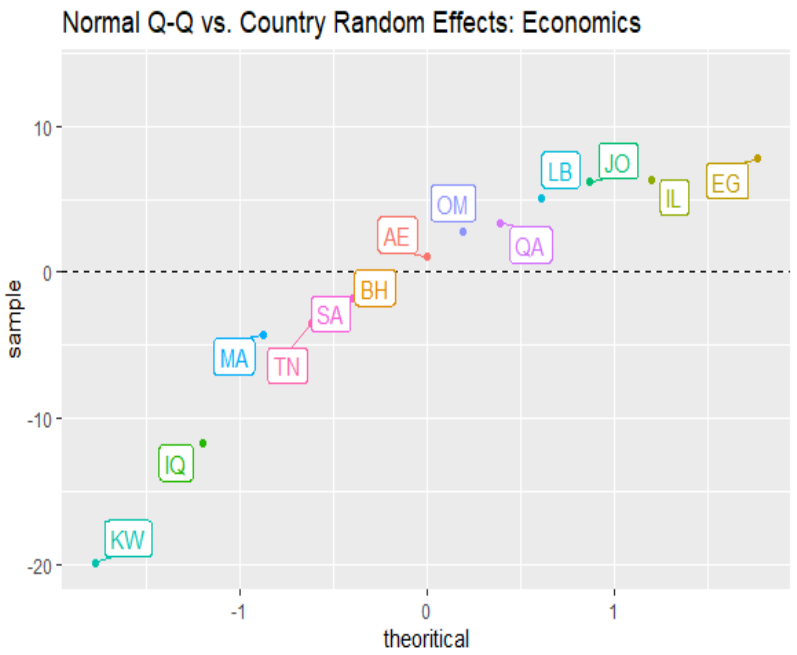
Scrutiny categories, country groups and time patterns and what is beyond?

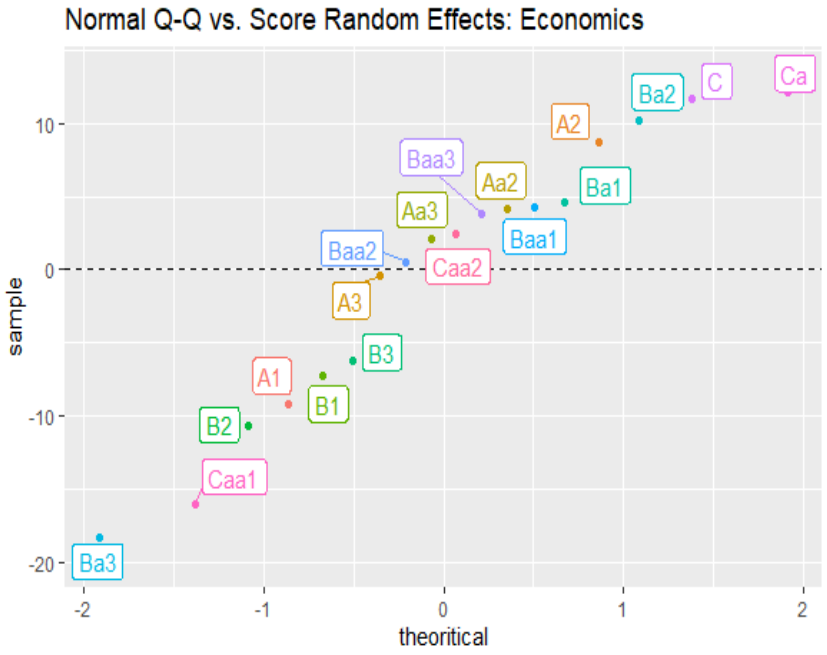
Other fixed-effects variables

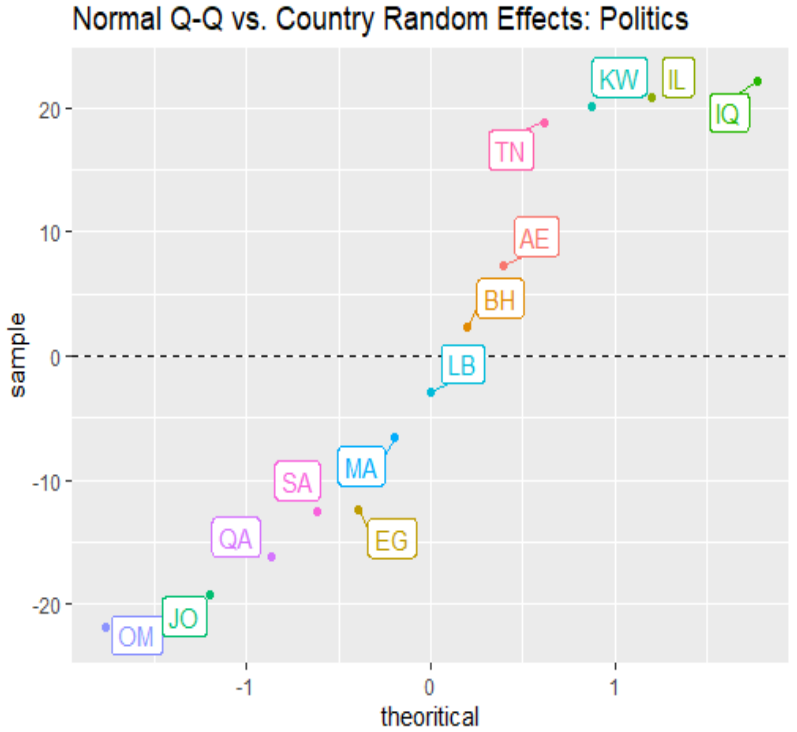
- **Rating outlook:**
  when (+) focus changes
  When (RUR) politics reverses
- **Report Type:**
  Issuer comment more politics
  Issuer in-depth more economics
- **Report length and writing style are both controlled for.**

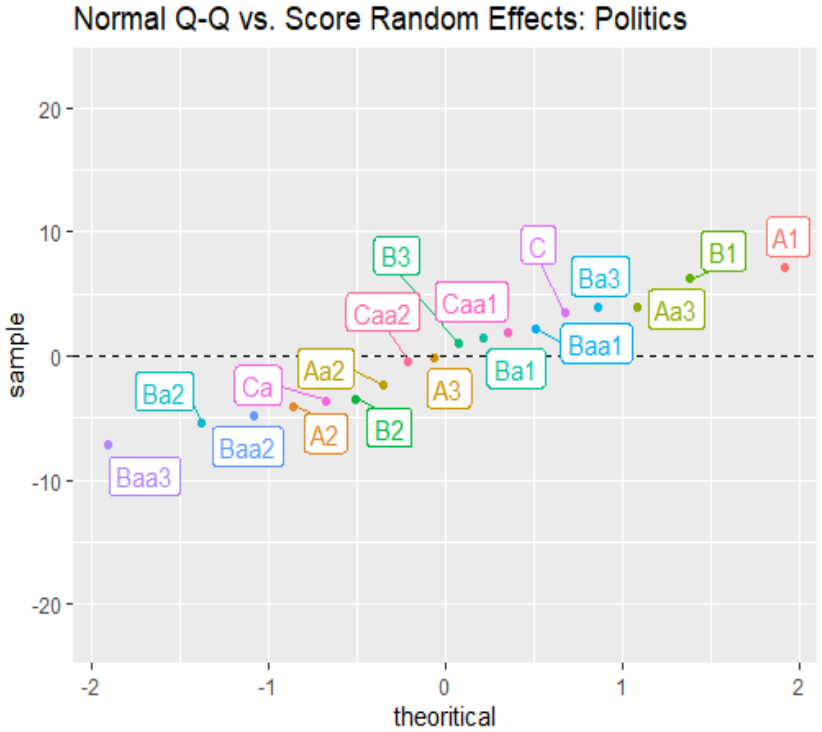
	Dependent Variable		
	Economics	**Political**	**Social**
Fixed Effects			
Rating Outlook (Base: Stable)			
Positive	10.03* (4.72)	-5.42 (4.18)	-5.07* (2.29)
Negative	-0.36 (2.86)	-1.72 (2.52)	-0.78 (1.38)
RUR	16.72 (8.81)	-16.63* (7.70)	-7.40 (4.46)
Report Type (Base: Credit Opinion)			
Issuer Comment	-13.28*** (3.11)	10.04*** (2.73)	2.20 (1.51)
Issuer In-Depth	4.18 (4.36)	-15.87*** (3.83)	-9.27*** (2.12)
Word Count	0.48*** (0.01)	0.20*** (0.01)	0.09*** (0.00)
Sentence Count	-0.22*** (0.05)	0.20*** (0.05)	-0.23*** (0.03)

Country-to-country and score-to-score variability on the impact of scrutiny categories, country groups and time periods on scrutiny patterns.









Confirming the Common Notion

	Dependent Variable	
	Economics	**Political**
Random Effects (Variance)		
Country	74.72	455.47
Score	137.93	44.41
Residuals	661.97	509.51

- The nexus between score variability and economic scrutiny is well established.
- It is still difficult to link socio-political aspects to rating outcomes.

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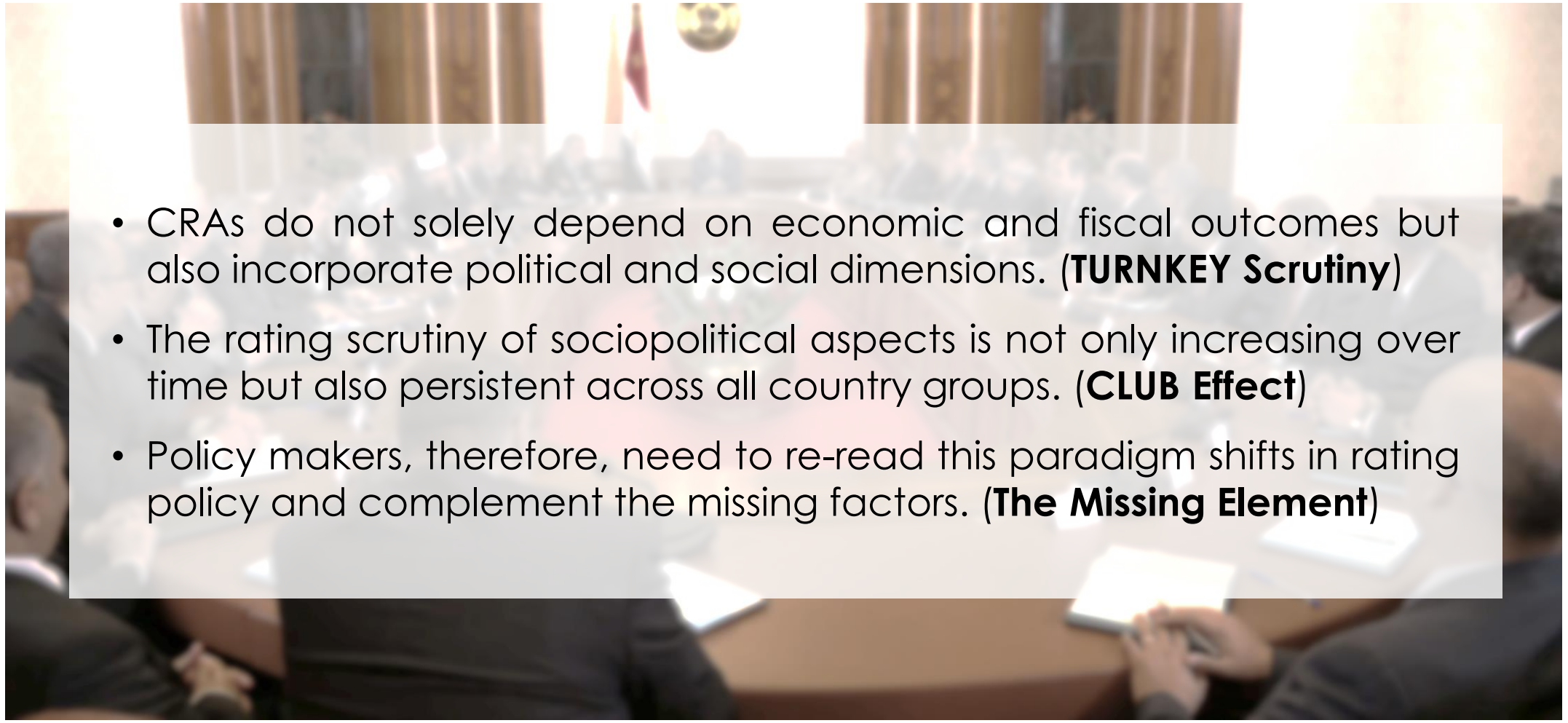
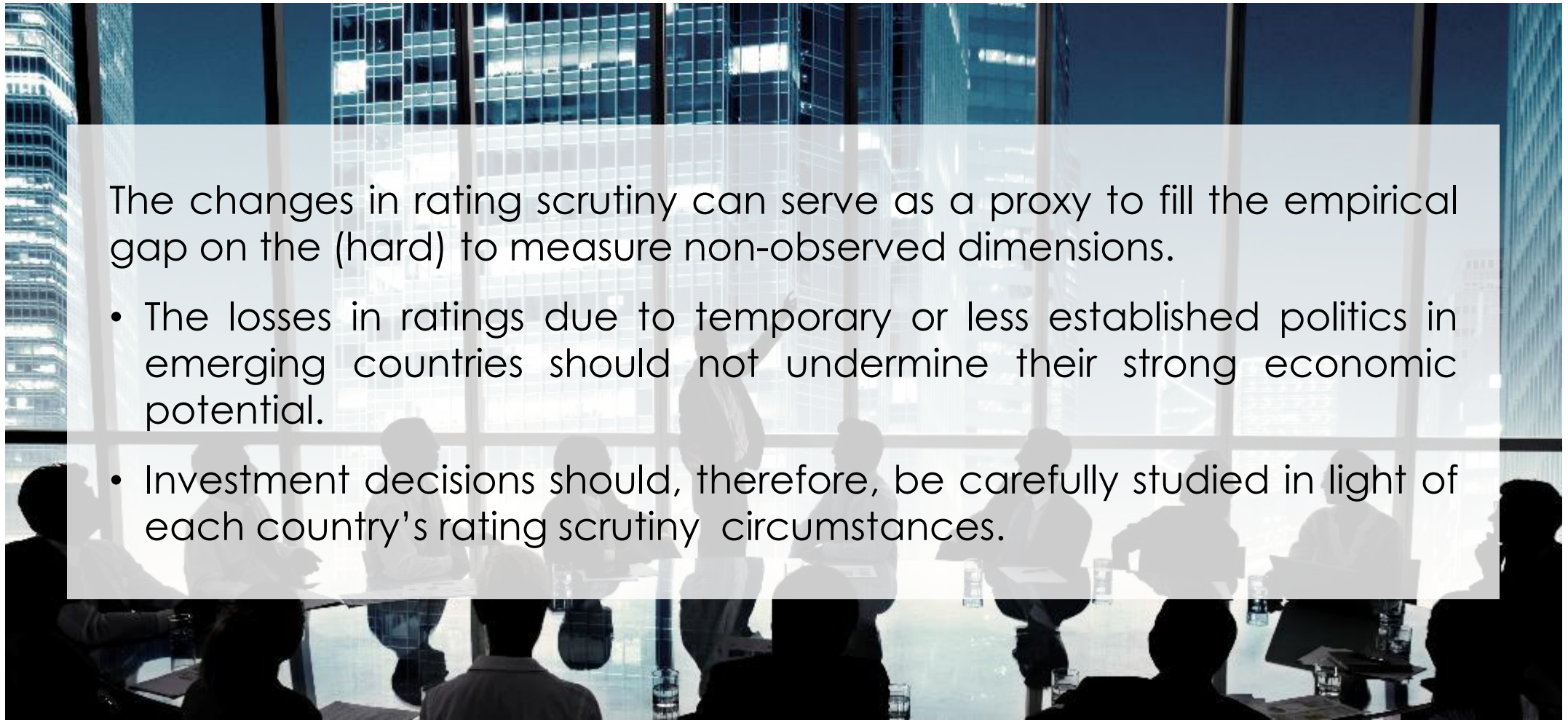
Policy Makers



- CRAs do not solely depend on economic and fiscal outcomes but also incorporate political and social dimensions. (**TURNKEY Scrutiny**)
- The rating scrutiny of sociopolitical aspects is not only increasing over time but also persistent across all country groups. (**CLUB Effect**)
- Policy makers, therefore, need to re-read this paradigm shifts in rating policy and complement the missing factors. (**The Missing Element**)

Market Participants

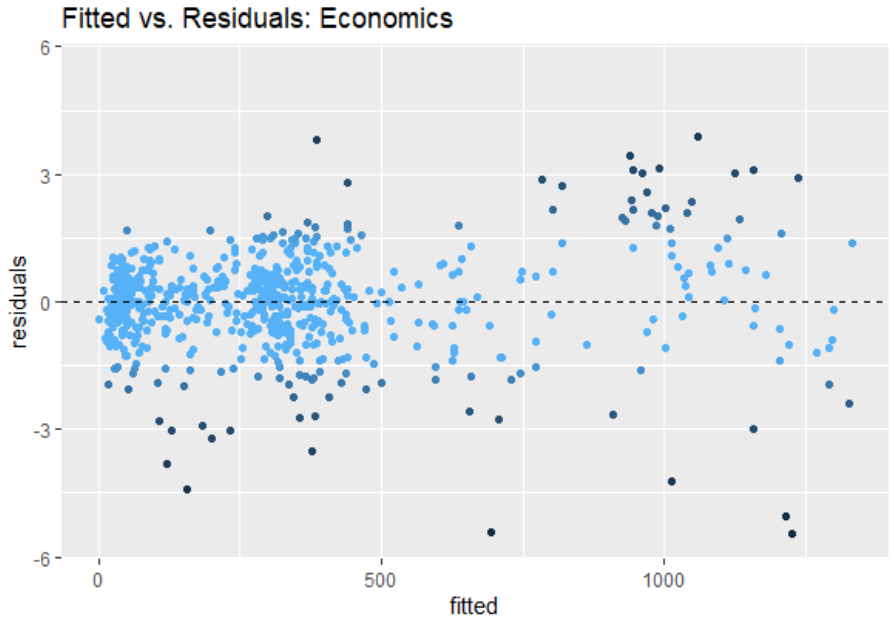


The changes in rating scrutiny can serve as a proxy to fill the empirical gap on the (hard) to measure non-observed dimensions.

- The losses in ratings due to temporary or less established politics in emerging countries should not undermine their strong economic potential.
- Investment decisions should, therefore, be carefully studied in light of each country's rating scrutiny circumstances.

Rating Agencies

- Financial crisis proved that **sociopolitical factors are as important** as economic and fiscal results as they govern the quality of ratings.
- **CRAs, accordingly, started to incorporate these components in their sovereign ratings but:**
  - still difficult to evident link sociopolitical decisions to rating outcomes from the rating manuals.
  - CRAs avoid discussing some of these aspects not to lose their epistemic authority.
- **CRAs need to be transparent and accurate on the dedicated weights of these factors in their manuals.**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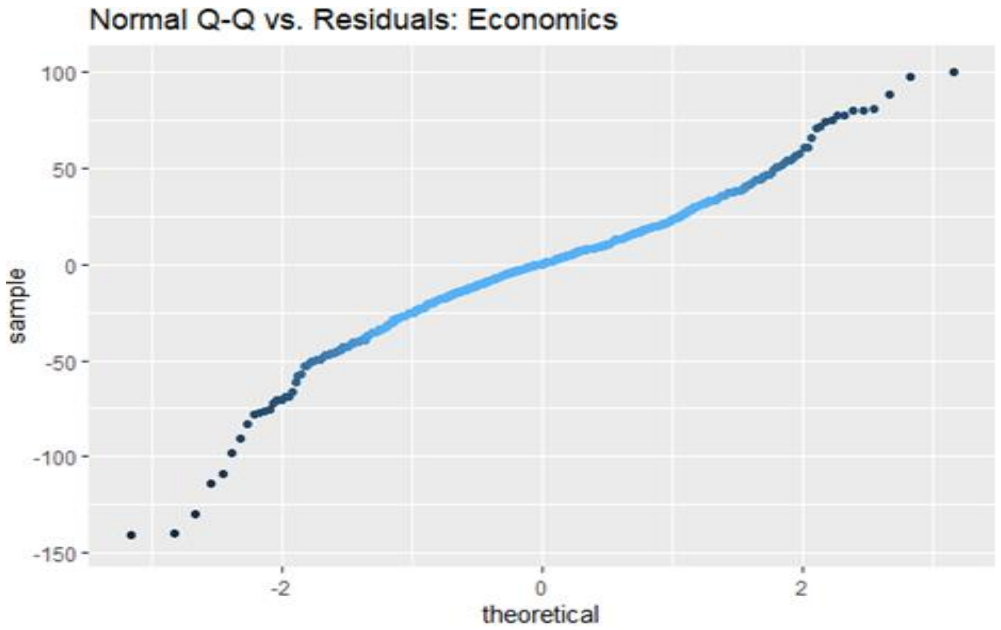
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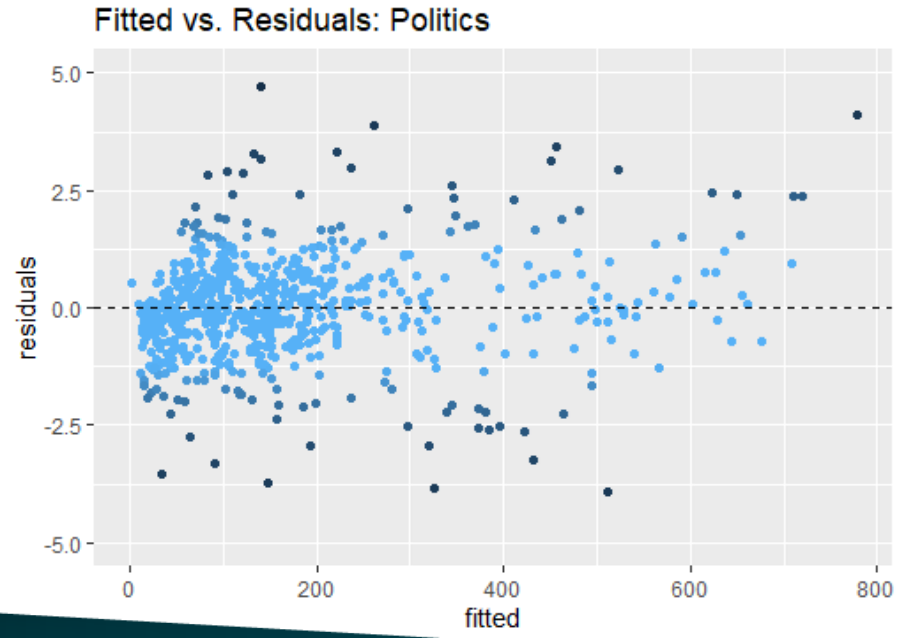
Fitted vs. Residuals: Politics
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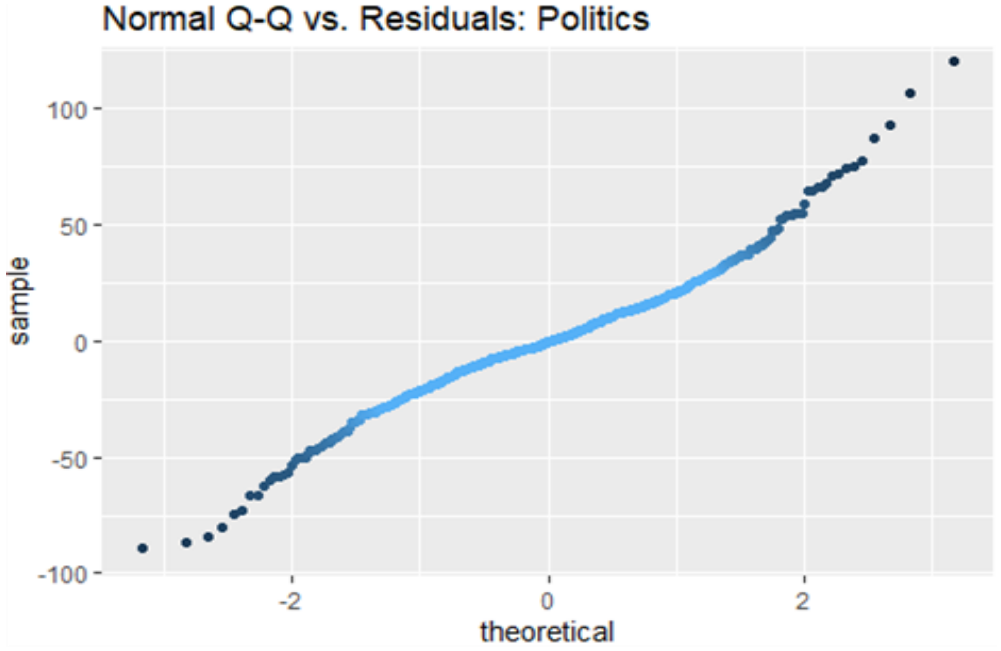
Normal Q-Q vs. Residuals: Politics
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Back