Measuring International Financial Supervisory Transparency

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Why financial supervisory transparency?

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Promotion

Supervisory transparency has been **promoted** by international/supra-national institutions including the IMF, Basel Committee, and the European Union for these reasons.

But...

We **lack reliable**, **cross-country**, and **cross-time** indicators of financial supervisory transparency to **test** these assertions.

Objective

Our objectives are to:

- **Develop** a reliable and valid indicator of supervisory transparency across countries and time.
  - Largely complete.
- Use this to **examine**:
  - **why** countries become more/less transparent,
  - **how**, if at all supervisory transparency affects economic outcomes.

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Methodological Contribution

Our indicator makes (at least) two important methodological contributions:

- Develop a Hierarchical Bayesian Item Response Theory-based **unique indicator** of countries' **willingness to credibly** reveal basic facts about their **financial systems to international actors**.
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Predecessors

Recent supervisory transparency indexes generally use **surveys** and then **sum** dichotomous responses.

- Lierdorp et al. (2013)
- Arnone, Darbar, and Gambini (2007) (based on classified IMF data set, data is not publicly available)
- Seelig and Novoa (2009)
- Masciandaro, Quintyn, and Taylor (2008)

Issues with previous methods

There are a number of issues with previous methods:

- Ironically, many of the surveys are **not transparent**.
- Survey methods are **laborious**.
- Surveys rely on **temporally ephemeral** information.
- So, survey methods provide only brief windows, **not time series**.
- Summing responses **assumes** that each item should be **weighted equally**.
- **High non-response rate** (Liedorp et al. had a response rate of 57%). This information is often **ignored**.
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Our Approach

We build on **Hollyer et al.s (2014)** approach to constructing a transparency indicator (also Stan Development Team (2014)).

Treat financial regulatory transparency (FRT) as an **unobserved latent variable**.

Our **FRT Index** summarizes countries' **likelihood of reporting** yearly data to indices included in the World Bank's Global Financial Development Database (**GFDD**).

Observations and items

60 **high income countries**, 22 years (**1990-2011**), 14 **items**.

The model

$$y_{k,c,t} = \begin{cases} 1 & \text{if item } k \text{ reported in country } c, \text{ year } t \\ 0 & \text{if item } k \text{ not reported in country } c, \text{ year } t \end{cases}$$

Esimate (from Stan Development Team (2014, 49-50)):

$$\Pr(y_{k,c,t} = 1 | \alpha_{c,t}) = \text{logit}[\exp(\log \gamma_k) * (\alpha_{c,t} - \beta_k + \delta)]$$

where:

- $\alpha_{c,t}$ is the estimated propensity for country c at year t to report item k. This can be thought of as the **transparency** score.
- $\log \gamma_k$ is the **discrimination** parameter for item k
- β_k is the **difficulty** parameter for item k
- δ is the **mean transparency**

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Priors (1)

$$\alpha_{c,1990} \sim \mathrm{N}(0,\ 1)$$

then rescentered by $\frac{\alpha_{c,1990} - \bar{\alpha_{1990}}}{SD_{\alpha,1990}}$

Then random-walk priors

$$\alpha_{c,t} \sim N(\alpha_{c,t-1},\ \sigma_{\alpha c}) \forall t > 1$$

where

$$\sigma_{\alpha c} \sim Cauchy(0,\ 0.25)$$

Priors (2)

$$\begin{aligned} \delta &\sim Cauchy(0,\ 0.25) \\ \beta &\sim N(0,\ \sigma_\beta) \\ \log \gamma &\sim N(0,\ \sigma_\gamma) \end{aligned} \tag{1}$$

where

$$\begin{aligned} \sigma_\beta &\sim Cauchy(0,\ 0.25) \\ \sigma_\gamma &\sim Cauchy(0,\ 0.25) \end{aligned} \tag{2}$$

Estimation

We estimated the model using **Stan**/No-U-Turn Sampler (good for highly correlated data).

Accessing source and data

The **source code** is available at:

`https://github.com/FGCH/FRTIndex`

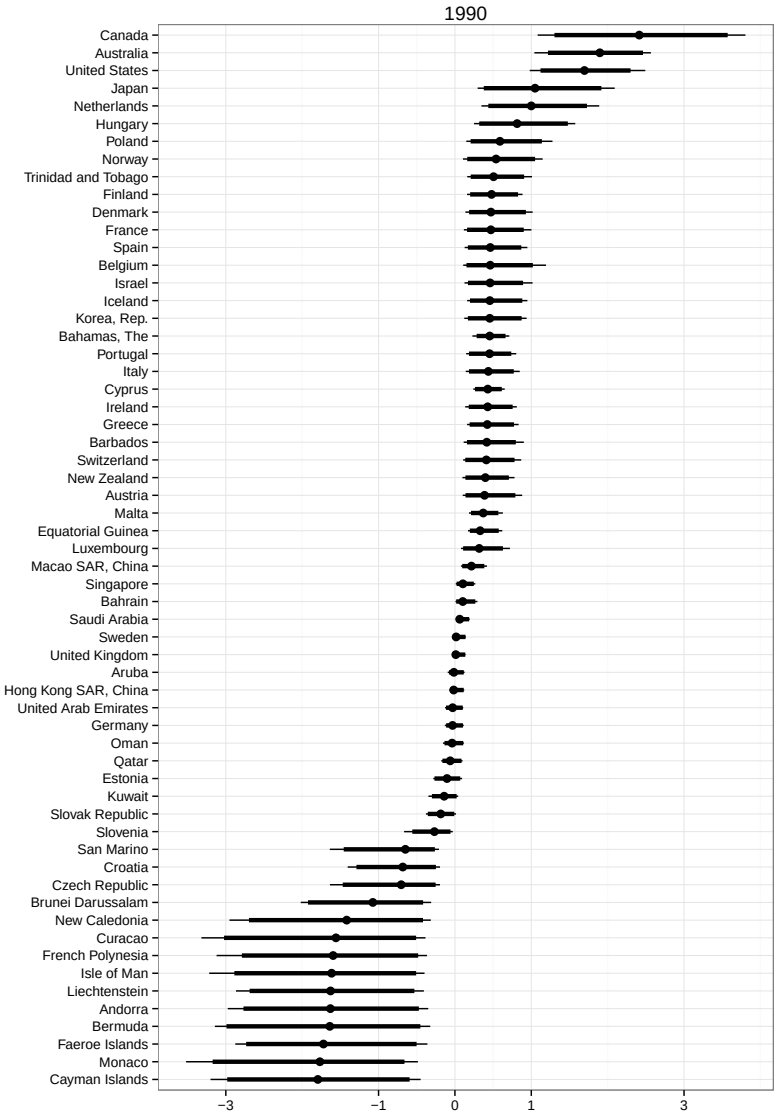
The (beta version) of the data set can be **downloaded** into R with:

```
frt_index <- repmis::source_data('http://bit.ly/1rZ49jB')
```

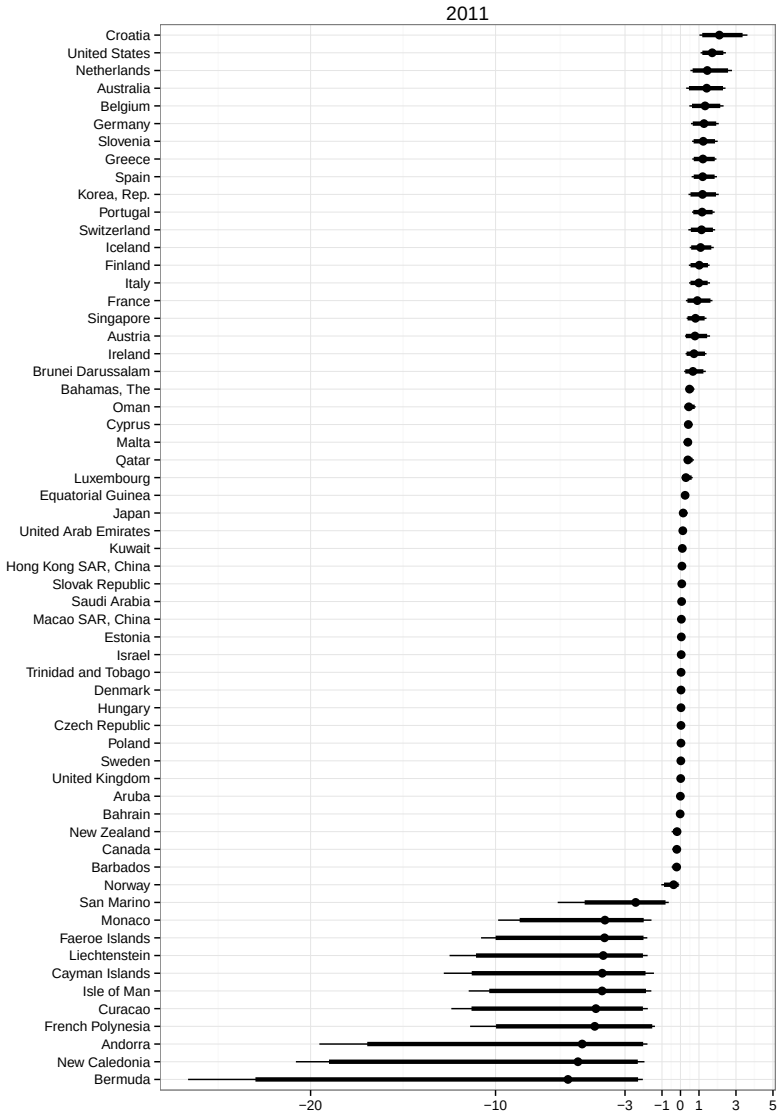
What are we actually measuring?

The willingness of a country to report **minimally credible** information about its financial system **to international institutions and investors**.

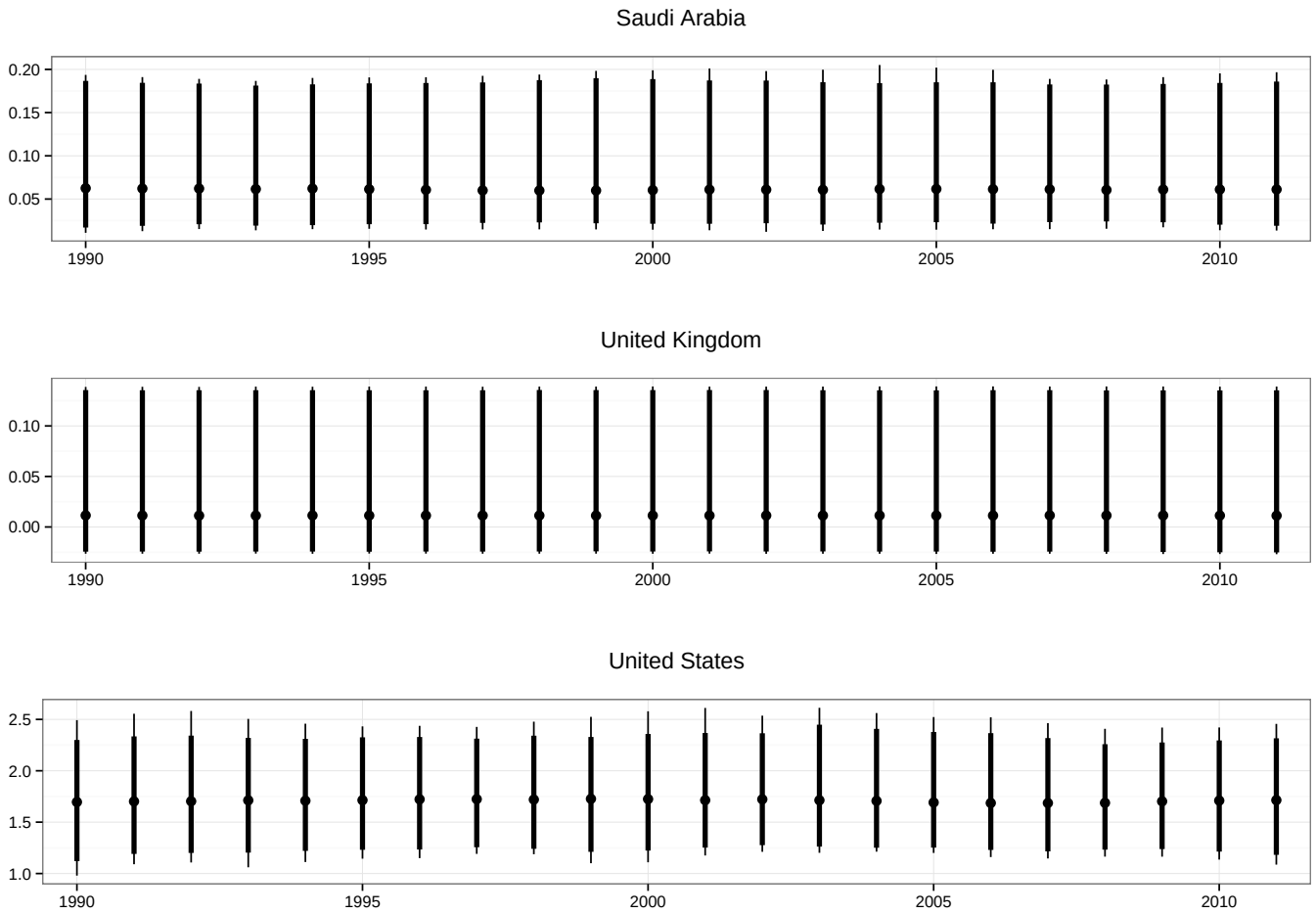
FRT Index Overview (1990)



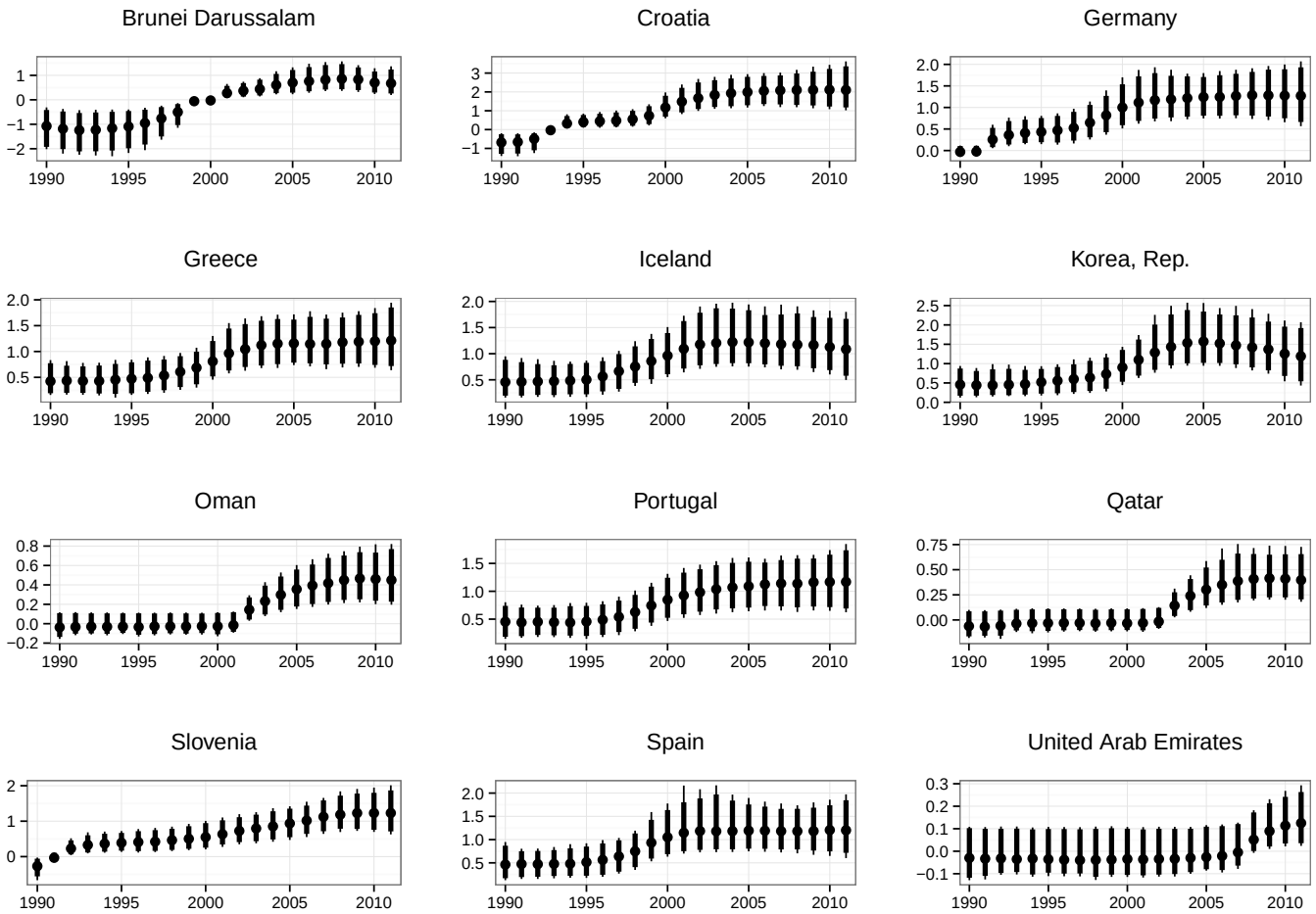
FRT Index Overview (2011)



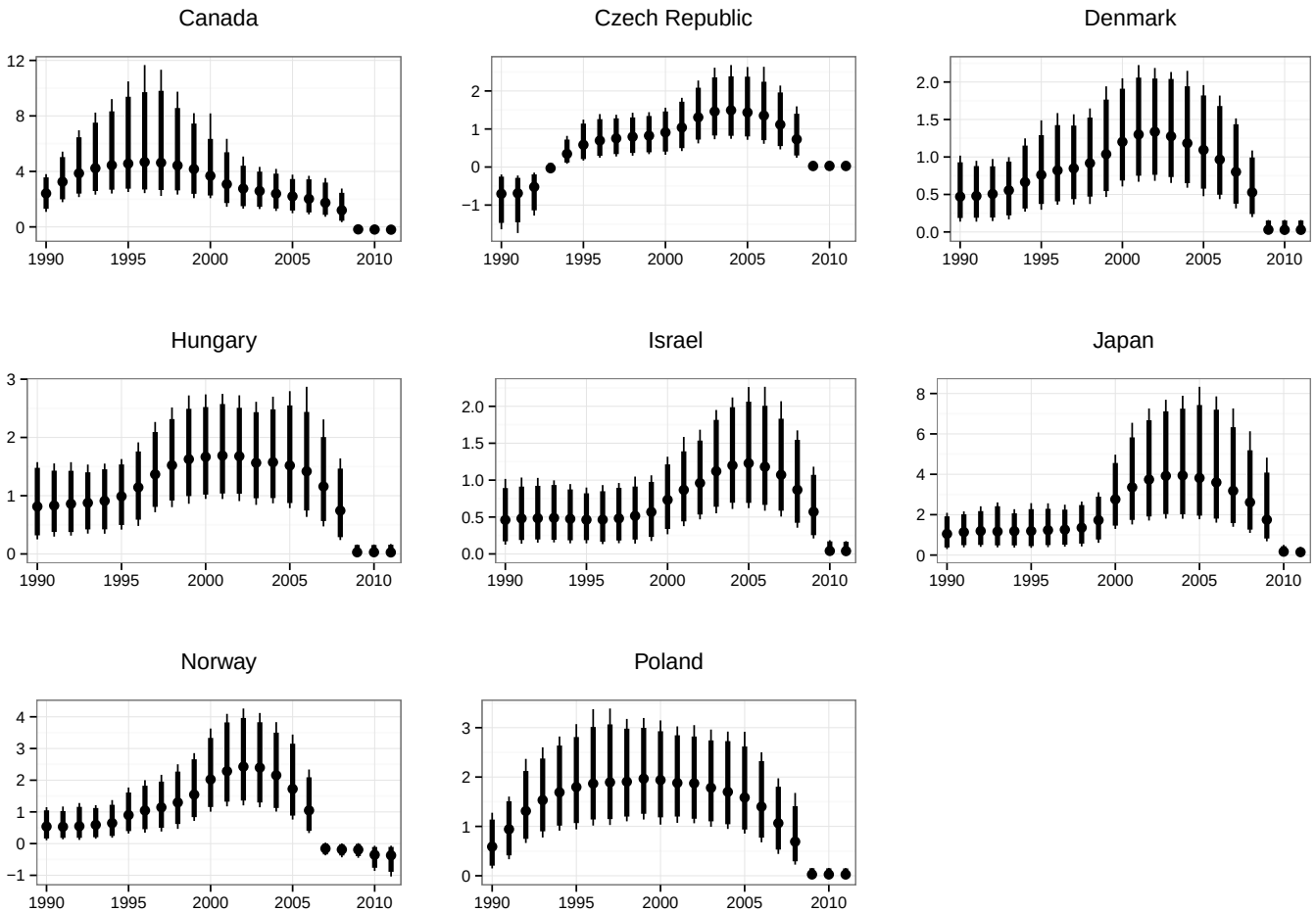
Stable Countries



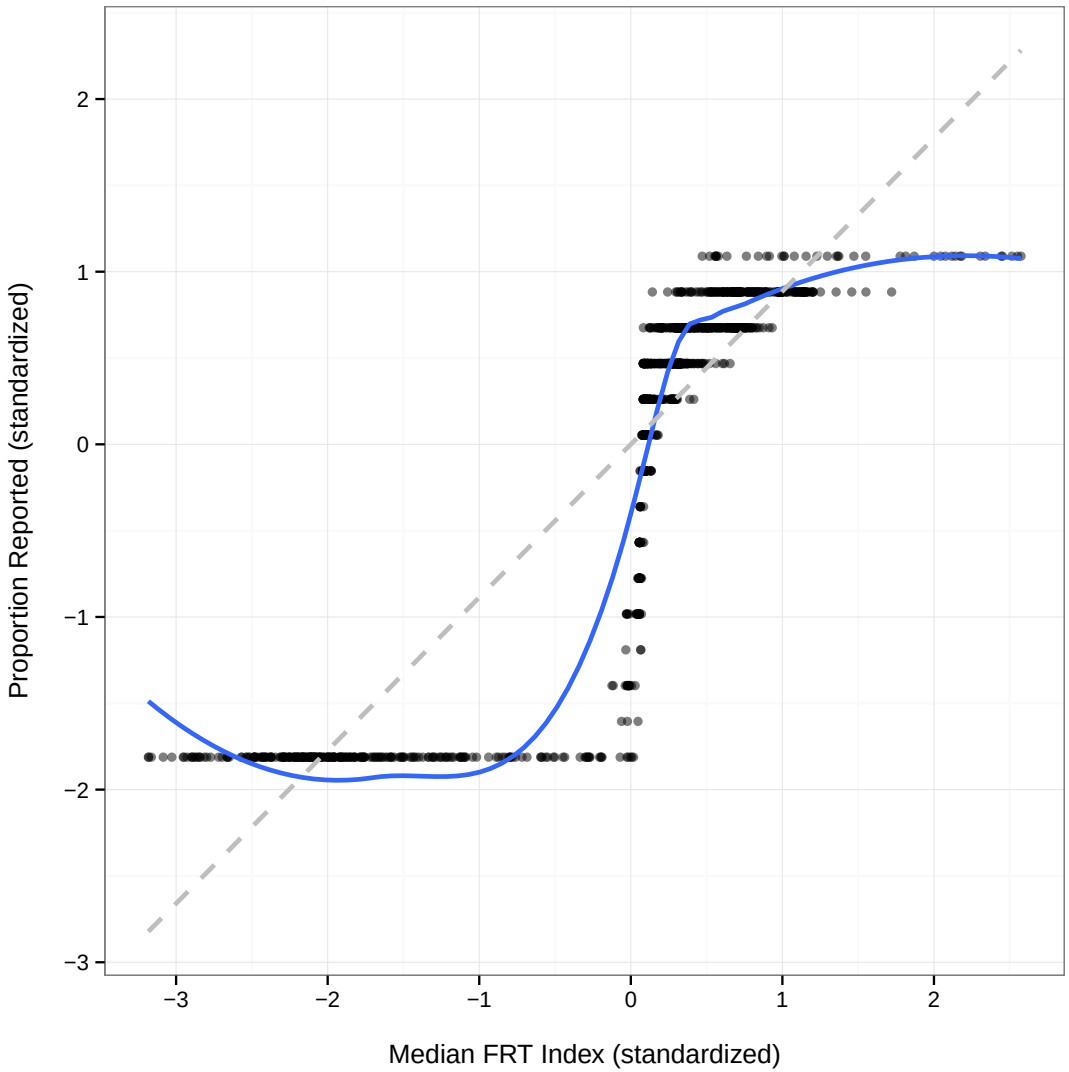
Improving Countries



Declining Countries

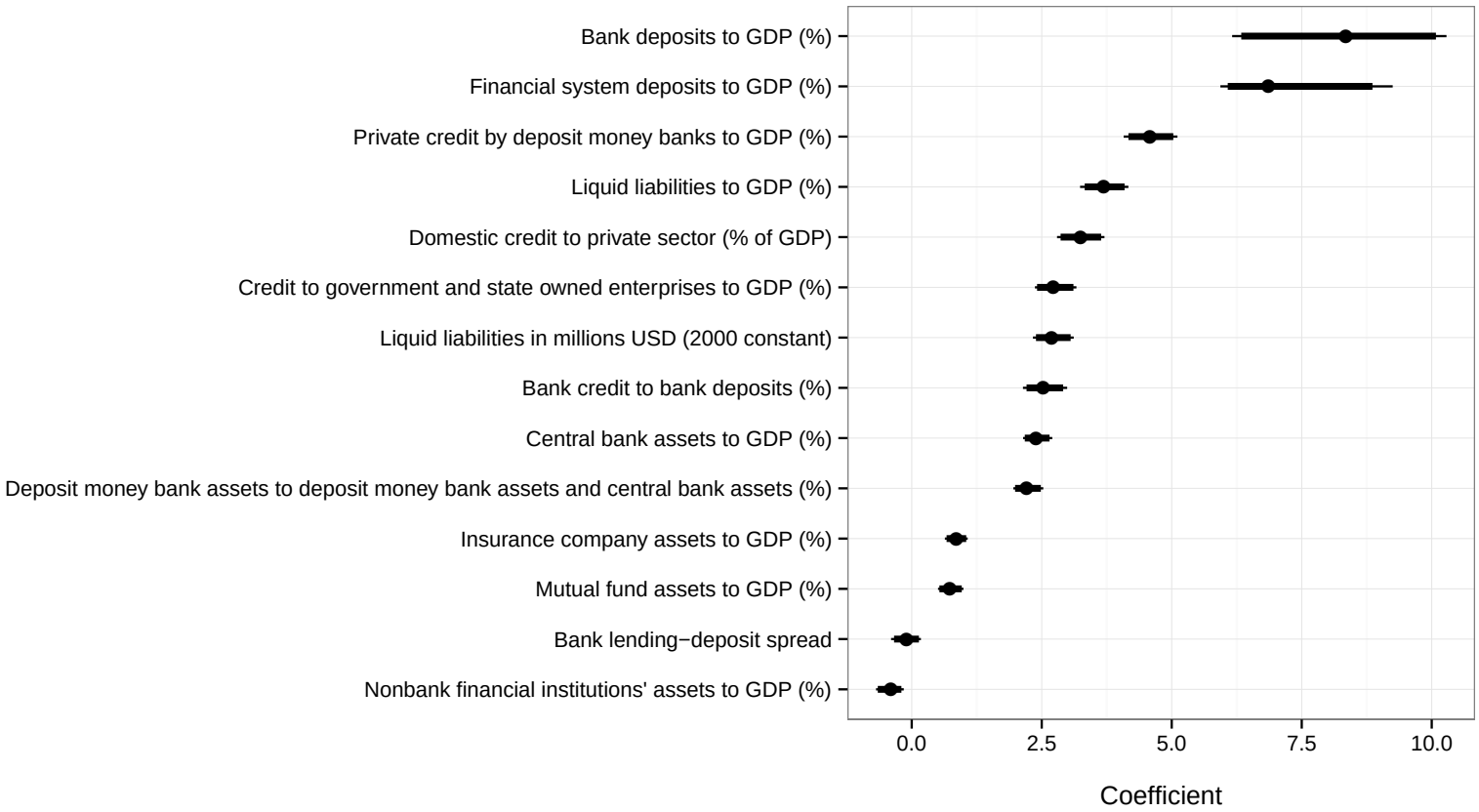


Comparison to frequency measure



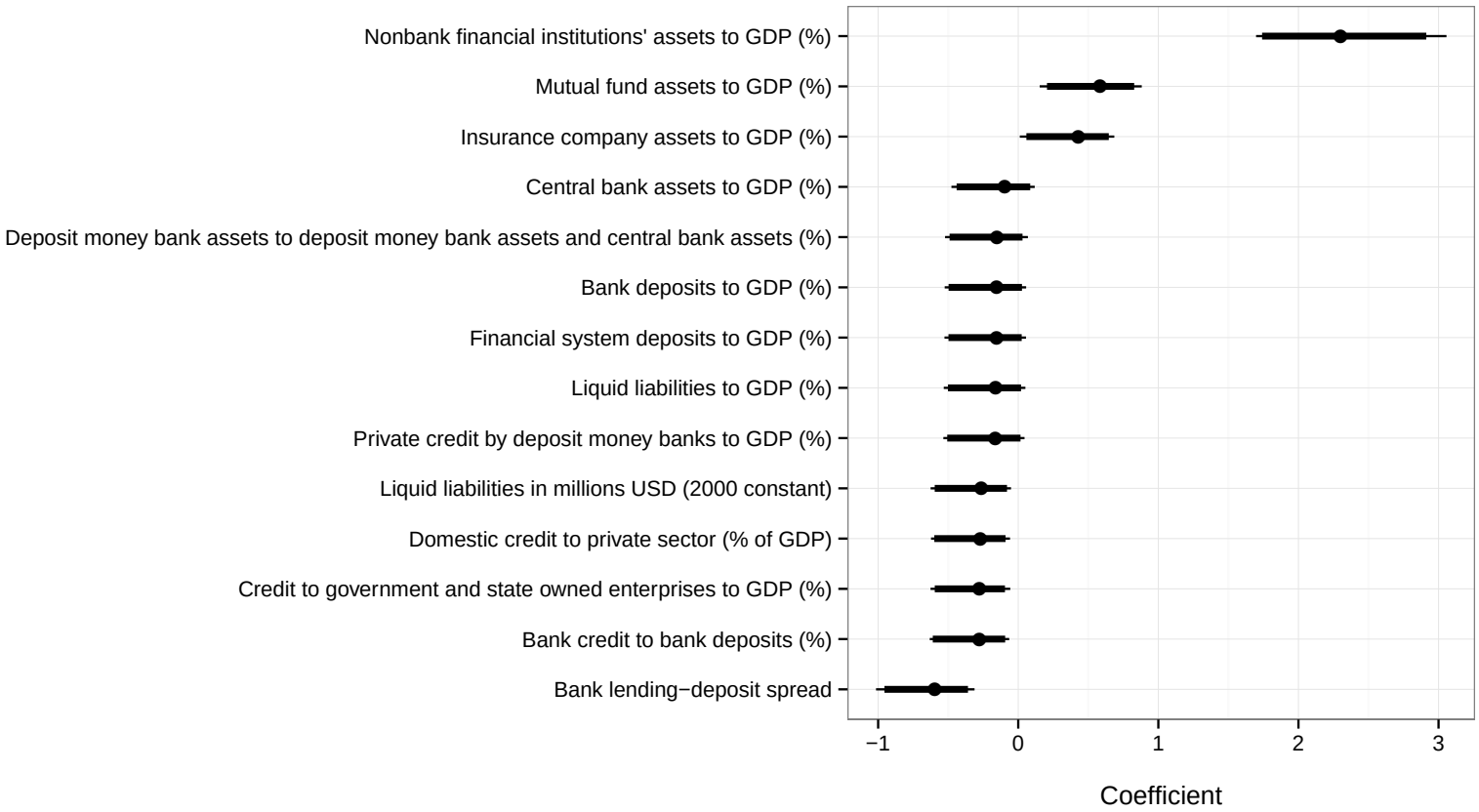
Discrimination parameter

How well reporting an item predicts reporting other items.



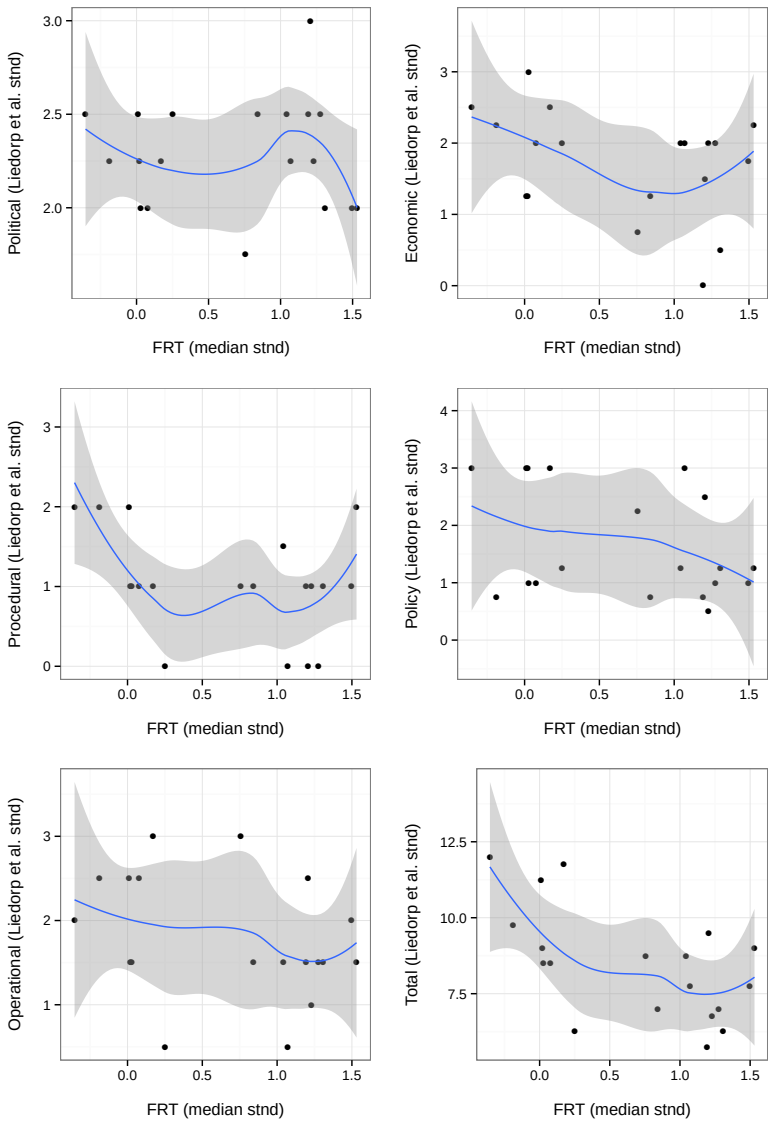
Difficulty parameter

On average how well reported is the item.



Comparison to survey/frequency measures

Comparision to Liedorp et al. (2013)



One annoying issue...

There is a possibility that **missing-ness** is sometimes caused by World Bank **data handling errors** rather than countries' willingness to report.

For example, Bank Deposits to GDP (%) is not reported for the UK. However, a **mirror** of the GFDD (FRED) **does have** the data.

`http://research.stlouisfed.org/fred2/series/DDOI02GBA156NWDB`

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- Examine how reporting is associated with economic outcomes:
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