

# Measuring International Financial Supervisory Transparency

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# Why financial supervisory transparency?

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- ▶ financial system stability,
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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**.
- ▶ Show that **missing financial system data is often endogenous** to financial system difficulties and policymaker's aspirations.

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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**.
- ▶ **No estimation of uncertainty**.

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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

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

Estimate (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  $k$
- ▶  $\beta_k$  is the **difficulty** parameter for item  $k$
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## Priors (1)

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

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

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)

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

where

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

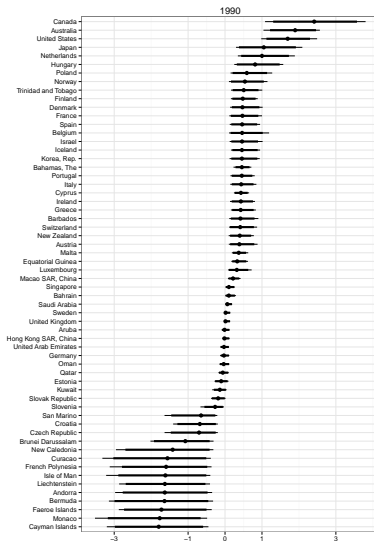
# Estimation

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

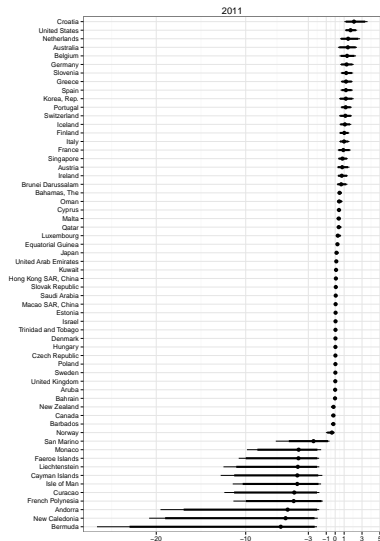
# What are we actually measuring?

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

# FRT Index Overview (1990)

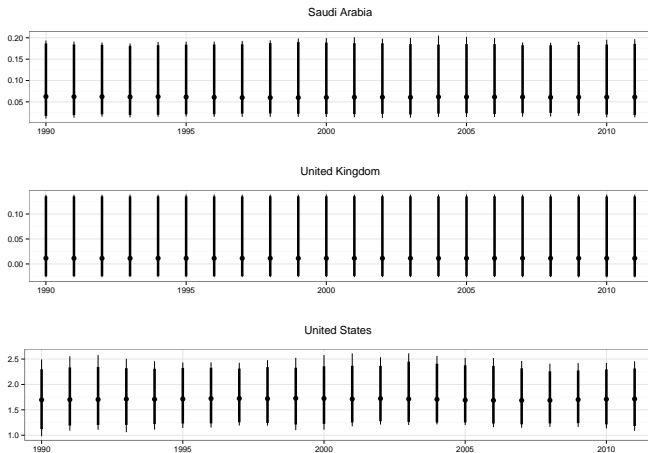


# FRT Index Overview (2011)

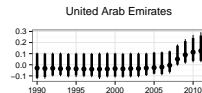
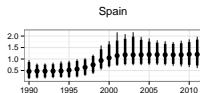
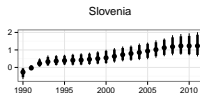
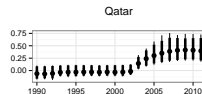
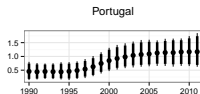
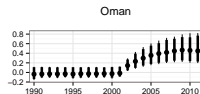
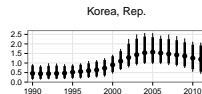
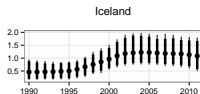
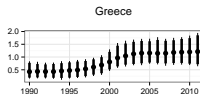
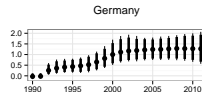
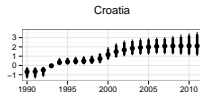
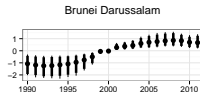




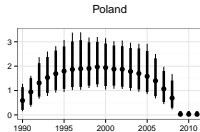
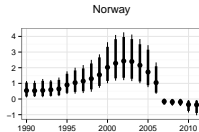
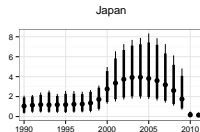
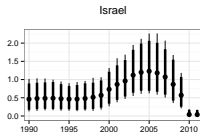
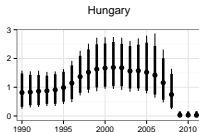
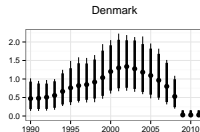
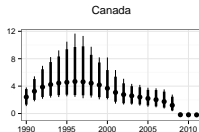
# Stable Countries



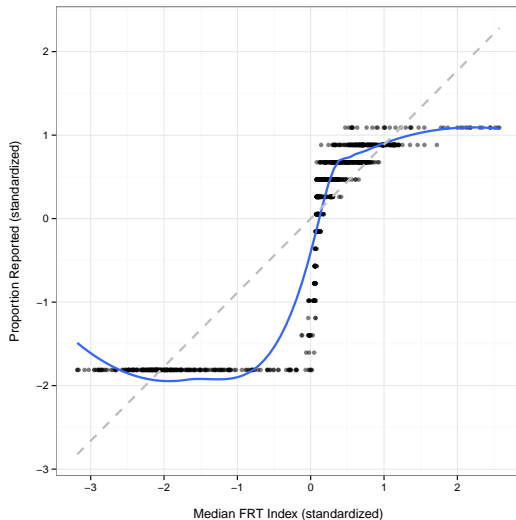
# Improving Countries



# Declining Countries

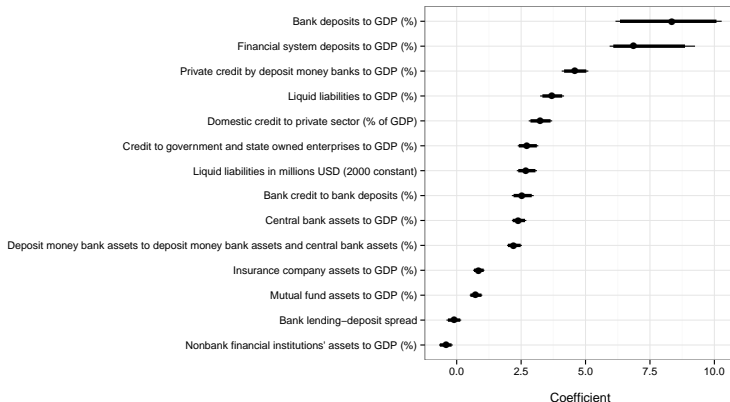


# Comparison to frequency measure



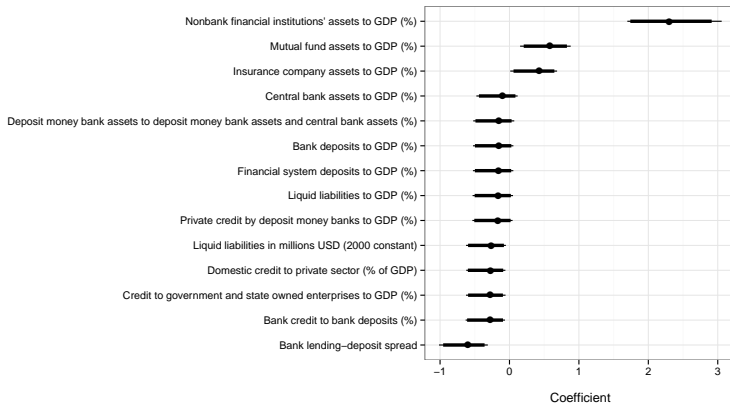
# Discrimination parameter

How well reporting an item predicts reporting other items.



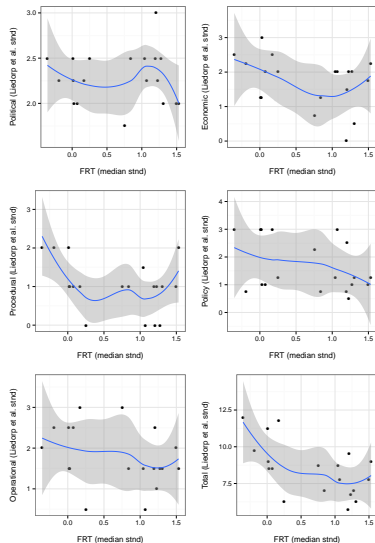
# Difficulty parameter

On average how well reported is the item.



# Comparison to survey/frequency measures

## Comparison 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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