Measuring Financial Regulatory Transparency

Mark Copelovich

University of Wisconsin, Madison

Christopher Gandrud and Mark Hallerberg

*Hertie School of Governance**

March 19, 2014

Abstract

Early working draft. Comments welcome.

For financial supervision to be effective, regulators need have accurate information about financial sector activities. For the public to be able to hold supervisors accountable then need access to the information financial supervisors have about the health of the banking system. In this paper we use Bayesian item response theory techniques to create a global and comparable Financial Regulatory Transparency (FRT) Index. The Index captures high income country's reporting to the World Bank and International Monetary Fund's Global Financial Development data set.

In previous research we have found that even within the relatively homogeneous European Union with supranational authorities tasked with gathering and reporting aggregate financial data from member states there is considerable variation in what is actually reported (see Gandrud and Hallerberg, 2014). We currently lack a comparable cross-national way of measuring country's level of financial regulatory transparency. In this paper we use a Bayesian Item Response Theory (IRT) approach

1 Creating the FRT Index

We treat financial regulatory transparency as an unobserved latent variable that effectively summarizes countries likelihood of reporting yearly data that is included in the World Bank's Global Financial Development data (GFDD) set first created by Čihák et al. (2012).[1]

*Friedrichstraße 180. 10117 Berlin, Germany. Contact email: gandrud@hertie-school.org. All material for replicating the FRT Index and the analysis in this paper can be found at: https://github.com/FGCH/FRTIndex.

[1] Access to the most updated version of the data set is available through http://data.worldbank.org/data-catalog/global-financial-development Accessed February 2014.

1.1 Included indicators

To measure financial supervisory transparency we first gathered data on whether or not governments reported data on a subset of indicators that are included in the World Bank's Global Financial Development data set. We followed Hollyer et al.'s (2014) criteria for inclusion of variables and countries. First, we only include indicators that are reported by at least one country for each year in the period 1998-2011. This gave us the greatest coverage of indicators that are comparable across countries. Second, we excluded all indicators that were explicitly gathered for only a subset of countries. As such we avoided including data where the primary source was the Bank for International Settlements. Third, we did not include any indicator that was primarily from a non-governmental source. This included both indicators from World Bank Sponsored surveys, such as the Global Financial Inclusion Survey and the Enterprise Survey. It also included data primarily derived from sources such as Swiss Re's Sigma Reports, Standard & Poor, Bankscope, and Bloomberg. Fourth, we did not include variables that are linear combinations of other variables. Fifth, we did not include variables that were simply references to the same quantity in different units. [CHECK TO SEE IF 4 AND 5 ARE RELEVANT] Sixth, we aim to focus on countries that have relatively highly developed banking systems. As such we include only countries and jurisdictions that the World Bank classifies as 'high income'.[2] Countries with levels of income this low likely do not have financial systems sophisticated enough to have the quantities reported in the indicators.

Using these criteria our model has 60 countries, 21 items, and 12 years (1998-2011). Table 1 shows the list of indicator items and descriptions.

Table 1: Indicators included in the FRT Index from the World Bank's Global Financial Development data set

SeriesCode	Indicator.Name	Source	Periodicity
GFDD.DI.01	Private credit by deposit money banks to GDP (%)	IFS/IMF	1961-2011
GFDD.DI.02	Deposit money banks' assets to GDP (%)	IFS/IMF	1961-2011
GFDD.DI.03	Nonbank financial institutions assets to GDP (%)	IFS/IMF	1961-2011
GFDD.DI.04	Deposit money bank assets to deposit money bank assets and central bank assets (%)	IFS/IMF	1960-2011
GFDD.DI.05	Liquid liabilities to GDP (%)	IFS/IMF	1961-2011
GFDD.DI.06	Central bank assets to GDP (%)	IFS/IMF	1961-2011
GFDD.DI.07	Mutual fund assets to GDP (%)	World Bank	1980-2011
GFDD.DI.08	Financial system deposits to GDP (%)	IFS/IMF	1961-2011
GFDD.DI.11	Insurance company assets to GDP (%)	World Bank	1980-2011
GFDD.DI.12	Private credit by deposit money banks and other financial institutions to GDP (%)	IFS/IMF	1961-2011
GFDD.DI.13	Pension fund assets to GDP (%)	World Bank	1990-2011
GFDD.DI.14	Domestic credit to private sector (% of GDP)	World Bank	Annual:
GFDD.EI.02	Bank lending-deposit spread	IFS/IMF	1980-2011
GFDD.EI.08	Credit to government and state owned enterprises to GDP (%)	IFS/IMF	1980-2011
GFDD.OI.02	Bank deposits to GDP (%)	IFS/IMF	1961-2011
GFDD.OI.07	Liquid liabilities in millions USD (2000 constant)	IFS/IMF	1960-2011
GFDD.SI.02	Bank nonperforming loans to gross loans (%)	IFSI/IMF	1998-2011
GFDD.SI.03	Bank capital to total assets (%)	IFSI/IMF	1998-2011
GFDD.SI.04	Bank credit to bank deposits (%)	IFS/IMF	1960-2011
GFDD.SI.05	Bank regulatory capital to risk-weighted assets (%)	IFSI/IMF	1998-2011
GFDD.SI.07	Provisions to nonperforming loans (%)	IFSI/IMF	1998-2011

Sources:

IFS = International Financial Statistics

IMF = International Monetary Fund

[2] We include both OECD and non-OECD high income countries.

1.2 The model

As in Hollyer, Rosendorff and Vreeland (2014) we let $y_{j,c,t} \in \{0,\ 1\}$ indicate a variable that is 1 when a country c reports a GFDD variable j in year$t$. It is 0 otherwise. We then estimate the model:

$$\Pr(y_{j,c,t} = 1 | transparency_{c,t} = \text{logit}(\delta_j + \beta_j transparency_{c,t})$$

The following parameters are estimated in the model:

- δ_j is the difficulty parameter of item j,
- β_j the discrimination parameter for item j,
- $transparency_{c,t}$ is the estimated propensity of a given country-year c, t to disclose financial regulatory data

2 Description and Validity

2.1 The FRT Index

Figures 1, 2, and 3 provide snapshots of the Financial Regulatory Transparency Index in the years 1998 (the Index's first year), 2007, and 2011 (the Index's current end year). Higher scores on the FRT Index indicate higher financial regulatory transparency.

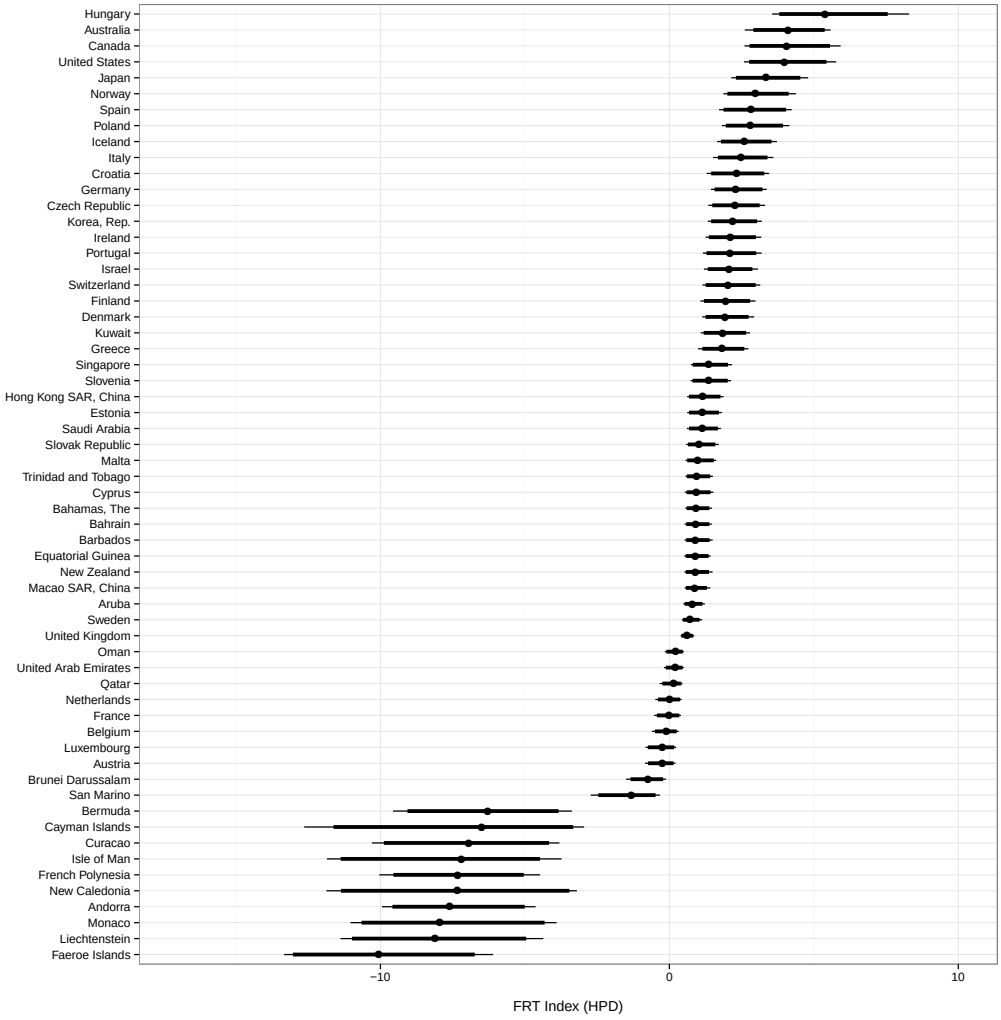
We should first notice that the index passes a face validity test. There is a noticeable cluster of countries with very low FRT scores. These countries include the Bermuda, Cayman Islands, the Isle of Man, and Monaco. All of these jurisdictions are known for their banking secrecy, often as explicit policy decisions to attract capital. At the high end of the scale we also see countries that have been known for their transparency. Gandrud and Hallerberg (2014) noted a high level of financial regulatory transparency in the United States' financial regulatory reporting practices relative to practices among many European Union countries. As we would expect from this work, the United States is regularly placed among the countries with the highest FRT score.

2.2 Indicator difficulty

2.3 Indicator discrimination

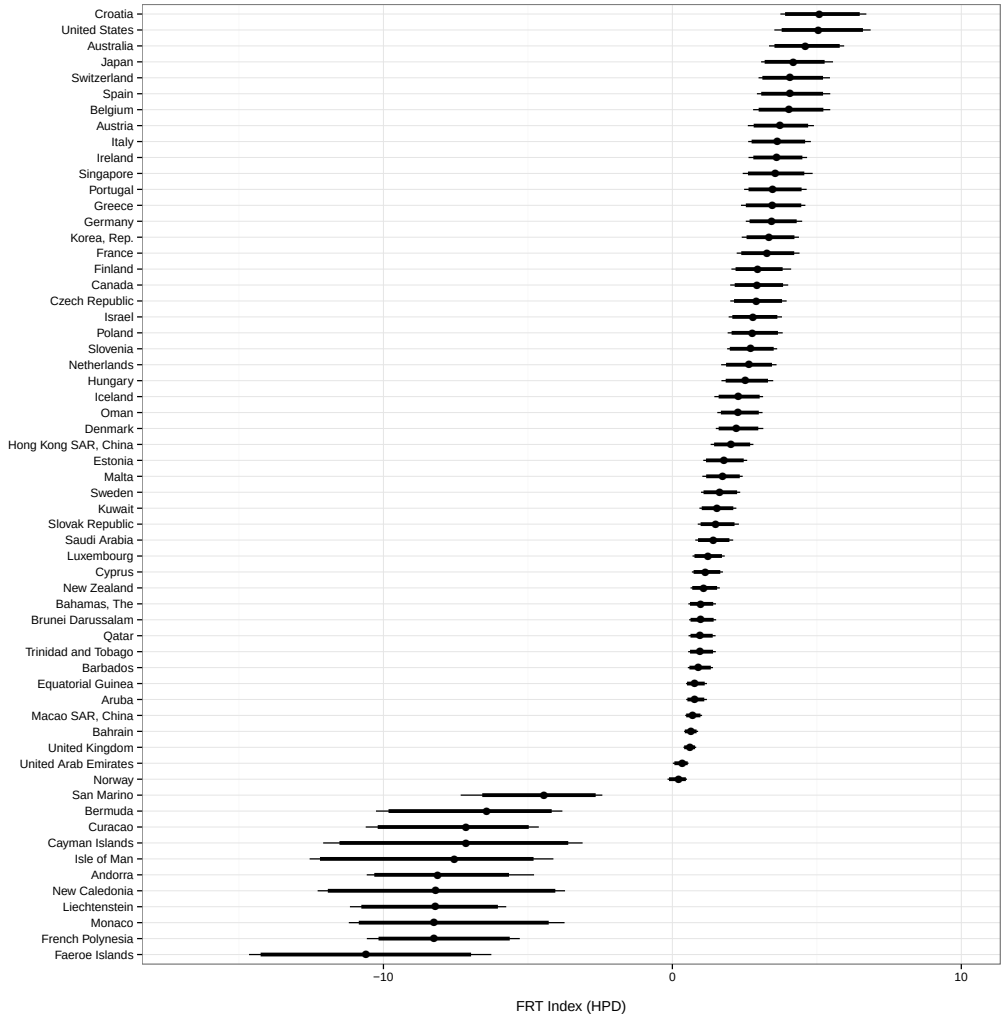
[OTHER TRANSPARENCY INDICATORS TO COMPARE AGAINST?]

Figure 1: Financial Regulatory Transparency Index in 1998



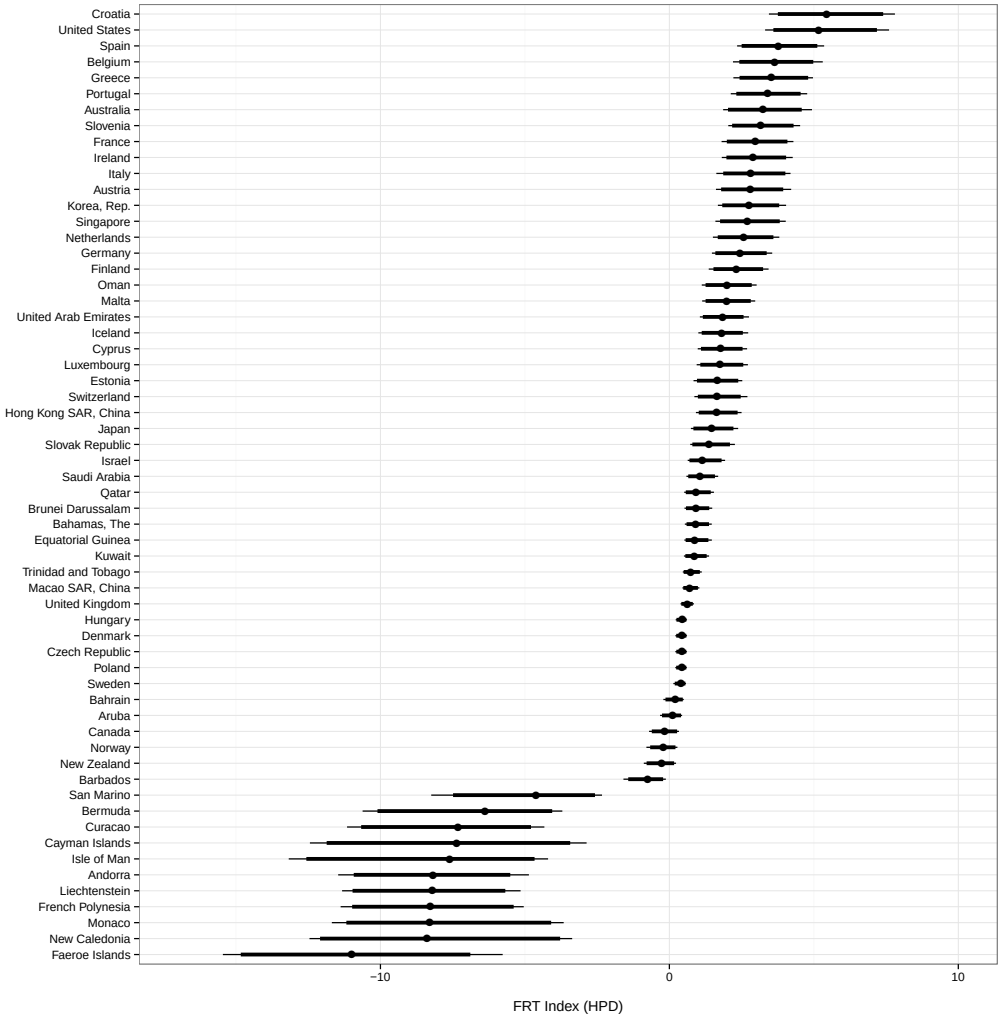
Thin lines represent the 95% highest posterior density interval. Thick lines represent the 90%.

Figure 2: Financial Regulatory Transparency Index in 2007



Thin lines represent the 95% highest posterior density interval. Thick lines represent the 90%.

Figure 3: Financial Regulatory Transparency Index in 2011



Thin lines represent the 95% highest posterior density interval. Thick lines represent the 90%.

3 Preliminary Associations

To demonstrate the potential usefulness of the FRT Index we examine a number of associations between the Index and the occurrence and potential occurrence of financial crisis.

[ASSOCIATION WITH ECONOMIC BUREAUCRATIC CAPACITY] [Z-SCORE (PROB. OF BANK DEFAULT) AS DEPENDENT VARIABLE]

References

Čihák, Martin, Asli Demirgüç, Erik Feyen and Ross Levine. 2012. "Benchmarking Financial Systems Around the World." *World Bank Policy Research Working Paper* (6175). Available at: http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2012/08/31/000158349_20120831220007/Rendered/PDF/wps6175.pdf. Accessed February 2014.

Gandrud, Christopher and Mark Hallerberg. 2014. "Supervisory Transparency in the European Banking Union." *Bruegel Policy Contribution* (01).

Hollyer, James R., B. Peter Rosendorff and James Raymond Vreeland. 2014. "Measuring Transparency." *Political Analysis* . doi: 10.1093/pan/mpu001.

Supplementary Materials