

Assessing the Democratic Deficit of Regulatory Authorities: A Cross-country and Cross-sector Comparative Perspective

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Abstract:

Previous scholarship has been concerned about regulatory authorities' weak democratic and legitimacy deficits. At the same time, scholars identified increasing mechanisms that overcome these democratic deficiencies by conferring power to external actors: transparency, accountability, participation, and inclusiveness. This paper tests these arguments utilizing a novel database on the formal and de-facto institutional mechanisms of regulatory authorities covering 49 regulatory agencies in nine European countries over three different regulatory sectors: data protection, food safety and the financial sector. This database offers a unique opportunity to assess institutional designs in a systematic and quantitative way and to learn on formal/informal institutional decoupling. In this paper we validate measures of formal and de-facto transparency, participation, accountability, and inclusiveness using item response theory (IRT) and explore sectorial and country differences across the formal and de-facto dimensions. Moreover, we explore the relationship between formal political independence, formal managerial autonomy and the eight measures.

Keywords: democratic qualities, regulatory bodies, , agency independence, item response theory, Bayesian analysis.

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I. INTRODUCTION

Previous scholarship has been concerned about regulatory authorities' weak democratic and legitimacy deficits. On the one hand, many scholars suggest that independent and expert-based agencies are deficient from a democratic perspective (Balla and Gormley 2017). This sense of danger to democracy stems from a representative democracy view that opposes the idea that non-majoritarian institutions could have such a significant impact on society (Majone 1999; Vibert 2007). On the other hand, scholars identified institutional mechanisms that regulatory bodies include that reflect increased democratic qualities such as transparency, accountability, participation, and inclusiveness (Maman 2022). While the majority of the regulation literature focus on accountability as the only legitimacy increasing quality for regulatory bodies (Jordana, Fernández-i-Marín, and Bianculli 2018; Brandsma and Schillemans 2013; Scott 2015), other scholars are increasingly studying transparency (Grimmelikhuijsen et al. 2021), participation (Beyers and Arras 2020; Braun and Busuioc 2020) and inclusiveness (Arras and Braun 2018; Perez-Duran 2018), in the context of regulatory bodies, showing how these mechanisms increase the openness of these bodies to external stakeholders and the public, and making regulatory decision making more responsive (Koop & Lodge 2020).

This paper aims to explore the prevalence of these mechanism across regulatory bodies in different countries and sectors and to explore the relationship between the political independence, managerial autonomy of regulatory authorities and such mechanisms for external involvement. This will contribute to the ongoing discussion on the democratic legitimacy of these bodies (Gilardi 2009). To do so, this paper utilizes a novel database that includes data on the transparency, participation, inclusiveness, accountability, political independence, and managerial autonomy of 49 regulatory bodies in eight countries and in the EU level. The data refers both to the formal and legal obligations of agencies, and to the extent to which these mechanisms work in practice (Maman et al. 2021). The dataset covers public bodies (agencies, ministries, and ministerial units) that regulate three sectors: Food safety, financial bodies, and data protection.

This paper has three aims: (1) Validating a measure for the formal and de-facto dimensions of these institutional mechanisms as employed by regulatory authorities; (2) Exploring how these mechanisms differ in different countries and sectors and between the two dimensions; and (3) Exploring the relationship between political independence and managerial autonomy and these mechanisms. It utilizes Bayesian methods of measure development (Item Response Theory) to validate the eight measures (Hanretty & Koop 2011; Iborra et al. 2018).

This article continues as follows. The next section provides information about our dataset and the criteria we followed to build it. Then, we detail our measurement validation analysis and results. In the fourth section we report some results in terms of the measures' scores and how they diverge across

sectors, countries and between formal and de-facto dimensions. Finally, we explore the relationship between formal political independence, formal managerial autonomy, and our eight measures.

II. DATABASE ON DEMOCRATIC QUALITIES OF REGULATORY BODIES

A. *General characteristics*

The database on which this paper builds on was built on a two-way cross-classification (Jordana & Levi-Faur 2005; Iborra et al.; 2018) focusing on regulatory bodies in two overlapping categories: countries and sectors. Overall, our database includes data on 49 public regulatory organizations in three sectors: Finance, Data protection and Food safety, operating at the European Union level, in a number of Member States (Spain, Germany, Belgium, Denmark, Netherlands and Poland) and non-Member States (Israel, Norway and Switzerland). The dataset also includes a sample of sub-national level institutions in countries where regulatory powers are decentralised (In the case of Spain, Germany and Switzerland). The institutions were identified as the core regulatory bodies that deal with supervision and enforcement in each of the three sectors. These institutions are diverse in terms of their institutional design and include either agencies, ministries, or ministerial units. Figure 1 summarizes the distribution of organizations across these characteristics.

B. *Operationalization and indicators*

The data was collected and coded according to a list of indicators which were developed to assess the legal obligations of regulatory bodies and de-facto practice of transparency, participation, inclusiveness (Maman, Jordana, Perez-Duran, Triviño and Gómez-Díaz, 2021). These have been formerly conceptualized as the democratic qualities of regulatory agencies as they are organisational practices and mechanisms that confer power to external actors and democratize regulatory governance (Maman 2022).

Despite the conceptual overlap that exists among these concepts in the literature (Scott 2015), the indicators we built upon derive from conceptually separated definitions. **Transparency** is defined as the disclosure of information by agencies about their characteristics, operational processes, and decisions they make to external actors. **Participation** refers to procedures aimed for external actors to become involved within agency's decisional, deliberative, or consultative processes related to agency's responsibilities. **Inclusiveness** is how various groups are represented in agencies (market oriented and societal oriented). In addition, this dimension examines rules and practices about how human diversity (gender, ethnic, linguistic, age, experience, territories) is considered in agencies. Finally, **accountability** refers to how the agency reports, answers, and justifies its actions to external actors. This involves some possibilities of punishment to them, or feedback with consequences to the agency (Table 1 summarizes these concepts and offers some examples for indicators).

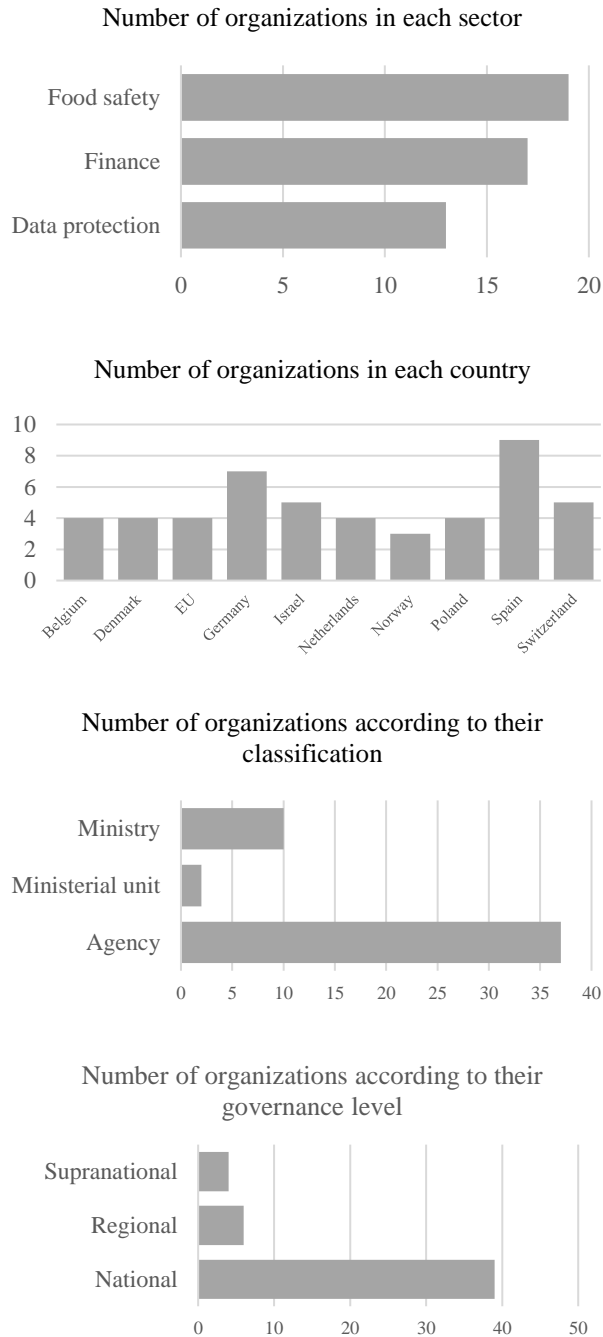


Figure 1: Distribution of the number of agencies by country, sector, organization type and governance level

For each quality, we constructed a list of indicators based on previous attempts (mostly Jordana et. al 2018 and Maman 2022). The indicators vary in their measurement scale, yet most are ordinal and only few are continuous. The ordinal items also vary between dichotomous items (0 signifying absence of the mechanism and 1 its presence) and polytomous items (with more than 2 response options where the higher score reflects a higher level of the quality). The indicators and their response categories are detailed in Appendix 1. During the data collection, we also coded the independent variables that,

according to our hypotheses, we expected to play a role as drivers of the democratic qualities, political independence and managerial autonomy.

Table 1: Conceptual clarification and separation

<i>Concept</i>	<i>Definition</i>	<i>Examples</i>
<i>Transparency</i>	The disclosure of information by agencies about their characteristics, operational processes, and decisions they make to external actors	<i>Publishing the strategic plans for the next years, publishing internal guidelines for the enforcement of existing rules, publishing the organizational structure of the body.</i>
<i>Participation</i>	Procedures aimed for external actors to become involved within agency’s decisional, deliberative, or consultative processes related to agency’s responsibilities	<i>Holding hearings in the rule-making stage, having the board meetings open to the public, performing round tables and other qualitative practices.</i>
<i>Inclusiveness</i>	How various groups are represented in agencies, rules and practices about how human diversity (gender, ethnic, linguistic, age, experience, territories) is considered in agencies	<i>Having gender equality rules for the board or the organization in general, website including various languages, having representation of different groups in the boards.</i>
<i>Accountability</i>	How the agency reports, answers, and justifies its actions to external actors. This involves some possibilities of punishment to them, or feedback with consequences to the agency	<i>Reporting annual plans to the legislative or executive, having a board of appeal, having a system to submit complaints on the website</i>

C. Coding procedure and data sources

The collection of the data and the coding was performed by coders from the different countries covered in the dataset. The coding scheme was executed using an online collaboration platform called “Ragic!” and guided through a detailed codebook (Maman et al. 2021). The coding was done based on a variety of data sources, depending on the indicators. The indicators for the formal qualities were based on the analysis of national (and/or regional) legislation. Two types of legal documents were included: a) general legislation (legislation that regulates government agencies on general practices or on transparency legislation) and b) agency specific or sector specific legislation (which regulates a specific agency or a specific sector). In some cases, coders have consulted with a legal scholar or expert with experience in the field for advice on the correct coding.

For the de-facto indicators, on the other hand, other sources were utilized. De-facto transparency and inclusiveness was coded based on an analysis of the information available on agencies’ official websites. De-facto participation and accountability was mostly coded based on information we collected in interviews with agency officials and only for some indicators based on information available on agency

websites. Interview questions are detailed in Appendix 2. In some cases, the interview questions were sent by email, filled independently by agency officials and sent back to the coding team which then coded them into the database.

Only 23 agencies responded to our request for a written or in-person interview. This yields a difference in the number of agencies in our database for which we have information on the de-facto participation and accountability and makes these two qualities with a smaller sample. Data collection was completed between spring 2021 and summer of 2022; the information included in our database refers to 2021-2022.

III. MEASUREMENT VALIDATION

In this study, we use a Bayesian regression model to validate the measures, based on item-response modeling technique. We use the indicator scores to estimate a score of each quality. But, instead of adding up all the indicators and counting the raw number, or simply calculating a mean, we employ a more refined measure using IRT. This method has been used by scholars to measure regulatory agencies independence, accountability, and governance complexity (Hanretty & Koop 2012; Iborra et al. 2018; Jordana et al. 2018).

Developed in psychology, item-response models allow us to generate a scores of formal and de-facto transparency, participation, inclusiveness and accountability (8 measures in total) that gives different weights (or discrimination) to each of the indicators included. So, instead of assuming that the significance of each indicator is equal to its score, we let the model estimate the discrimination, based on the number of agencies that have such an indicator (difficulty) and their relative position in the final score (discrimination) (Iborra et al. 2018).

Formally, we are interested in ξ_n , which represents the quality score of each agency (n) in a standardized scale that has, by definition, mean 0 and standard deviation 1. The Bayesian inference process specifies prior distributions for unknown parameters and updates these to become posterior distributions using observed data contained in the standard likelihood function (Quinn, 2004; Gill and Witko 2013). The posterior distribution represents the most informed set of knowledge about the phenomenon of interest because it is the most updated version available.

We use Bayesian inference following Gill and Witko (2013) for several reasons. First, the number of agencies included in our dataset is small (n=49), and Bayesian inference is particularly appropriate for such cases. Second, we wish to not assume that the items and their response intervals have equal weights and intervals since this introduces arbitrariness to the measure and ignores variant contribution of items to the measure (Hanretty & Koop 2012). Instead, we prefer a data-base validation strategy to construct this measure and chosen to use the IRT method.

Figures 2-9 plot the median of the estimated discrimination value along with the 95 percent credible interval for each measure model. The median value of the parameters indicates how strongly is the relative impact of each item on the quality measured. High discrimination means that the indicator conveys more information about the quality (Iborra et al.; 2018). For example, we see that the item “organ_struc_for”, which is the obligation to publish the organizational structure conveys a larger amount of information about formal transparency than the indicator “manag_board_min_for, that measures whether managing boards have the obligation to publish minutes from their meetings. Formerly, measures included the latter, and not the former, which emphasized the contribution of this analysis.

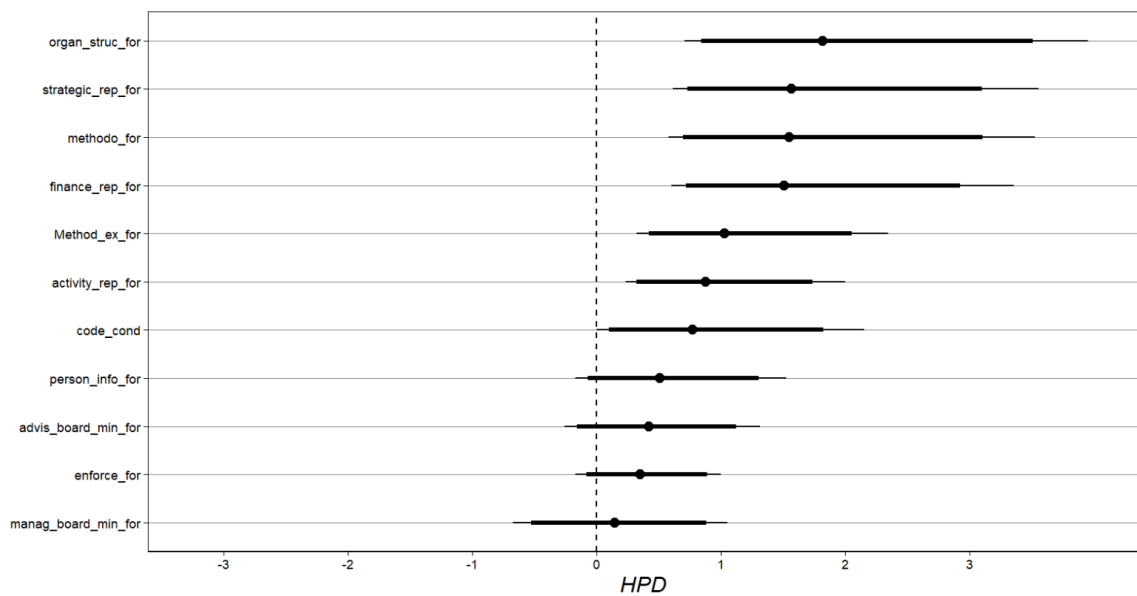


Figure 2: Formal Transparency - Discrimination Weight Assigned to Each Item in the Model (a).

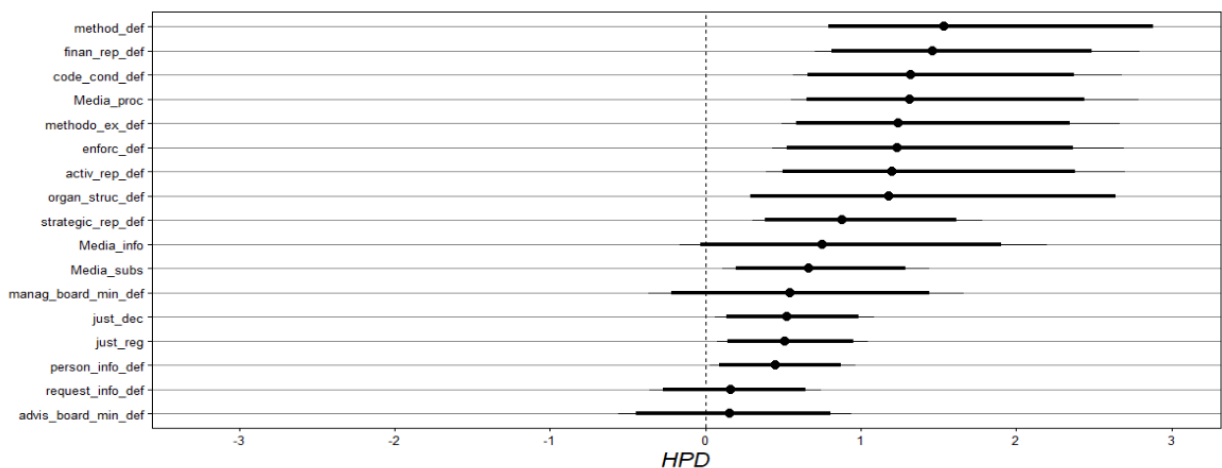


Figure 3: Transparency de-facto - Discrimination Weight Assigned to Each Item in the Model (a).

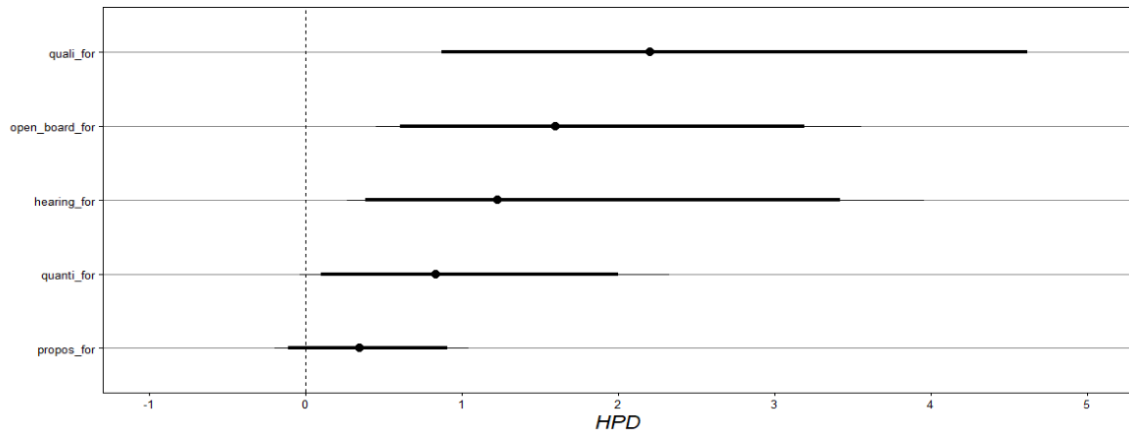


Figure 4: Formal Participation- Discrimination Weight Assigned to Each Item in the Model (α).

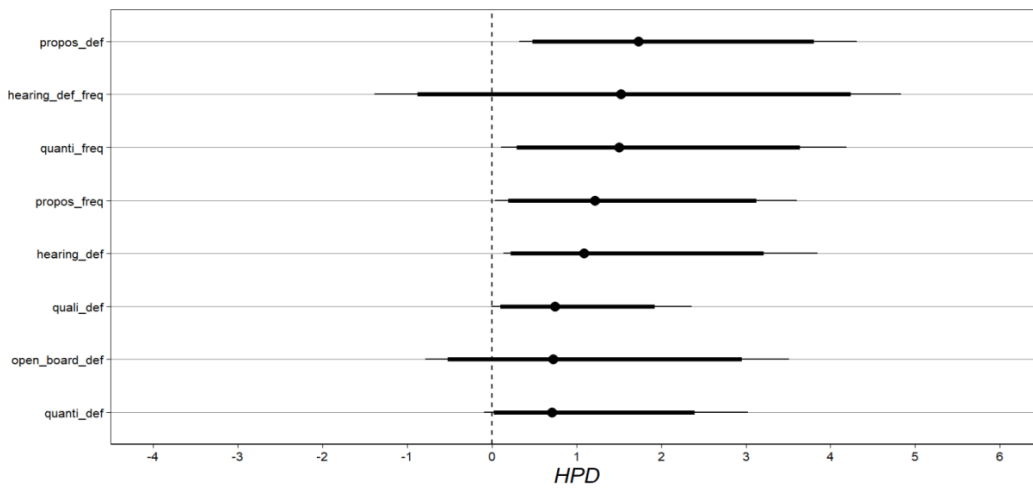


Figure 5: Participation de-facto- Discrimination Weight Assigned to Each Item in the Model (α).

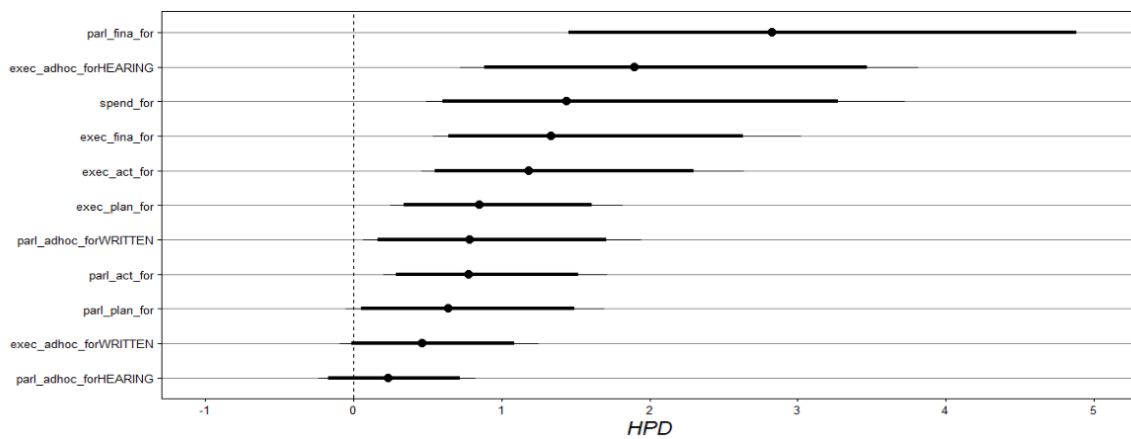


Figure 6: Formal Accountability - Discrimination Weight Assigned to Each Item in the Model (α).

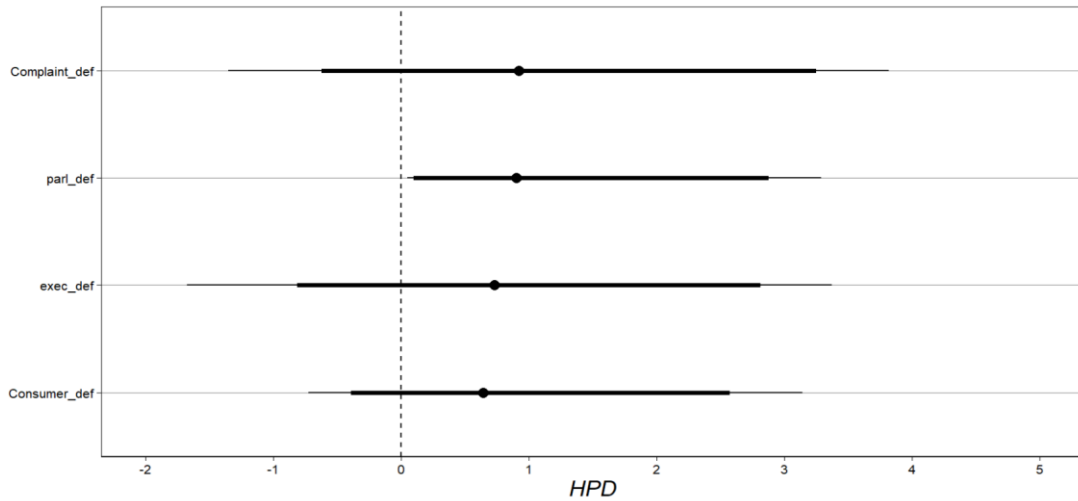


Figure 7: Accountability de-facto - Discrimination Weight Assigned to Each Item in the Model (α).

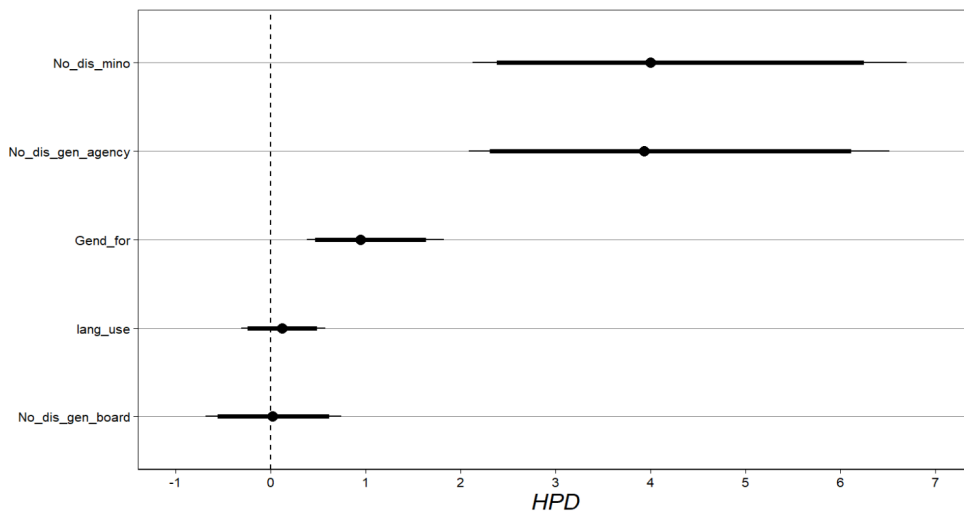


Figure 8: Formal Inclusiveness - Discrimination Weight Assigned to Each Item in the Model (α).

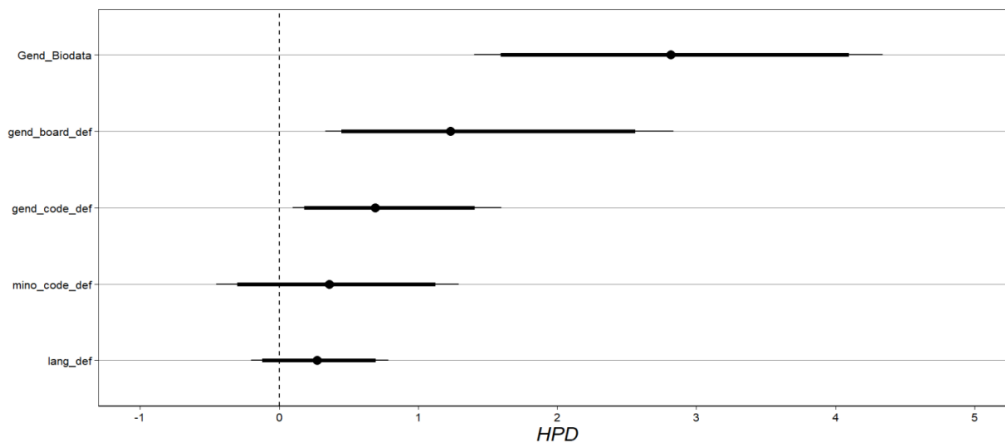


Figure 9: Inclusiveness de-facto - Discrimination Weight Assigned to Each Item in the Model (α).

Since some indicators turned to have a negative discrimination score, we removed them and then ran the model including only the remaining indicators. This was done to avoid interpretative failure and ensuring that the overall score reflects only the intended concept (Hanretty and Koop 2012). Here we include the results for the revised models only and Appendix 3 includes the information for both the full and revised models as well as the code we ran for each measure using the MCMC package in R (Martin et al. 2022).

Moreover, by applying the discrimination scores to the items each agency has, the model produces scores for the estimated latent mechanism of each agency. Appendix 4 shows the medians of estimated scores for each regulatory body in our database for all the measures along with the 95 percent credible interval. The scores have an arbitrary scale restricted to having a mean of zero and standard deviation of 1. Note that since 2 measures include full data only for 49% of the full sample (accountability de-facto and participation de-facto), many agencies scored 0 for them.

IV. EXPLORING SECTORIAL AND COUNTRY VARIANCE AND FORMAL/DE-FACTO DECOUPLING

In this section we will explore the variance between countries and sectors in terms of their formal and de-facto institutional mechanisms. While formal dimension refers to the legal obligation that the regulatory body includes the different mechanisms, de-facto measures the extent that the body includes them in practice.

A. Country differences

First, we compare the mean scores and standard deviation of the formal measures in the different countries. Figure 10 shows a great variance between countries and within countries. We see that some countries score clearly lower than other. These countries include Norway, Poland, Netherland and Germany. In Israel, formal inclusiveness acts as an outlier. While it scores relatively high in this quality, the other three score very low. On the other hand, regulatory bodies in Denmark have the highest formal scores. Again, if ignoring inclusiveness, the EU bodies also have very high scores.

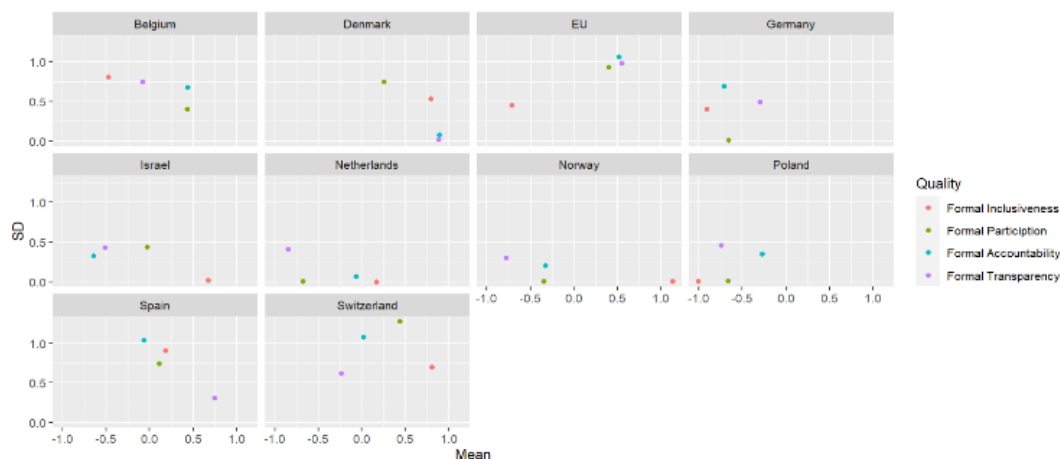


Figure 10: Association between formal quality means and standard deviations, by country

When we examine the de-facto mechanisms (Figure 11), we see now that Israel scores the lowest in terms of inclusiveness, and Germany the highest. We also see that Denmark again scores higher in de-facto institutional mechanisms. The EU scores the highest in terms of transparency de-facto, though Denmark and Switzerland both are very close. Poland is the least transparent country in terms of transparency de-facto.

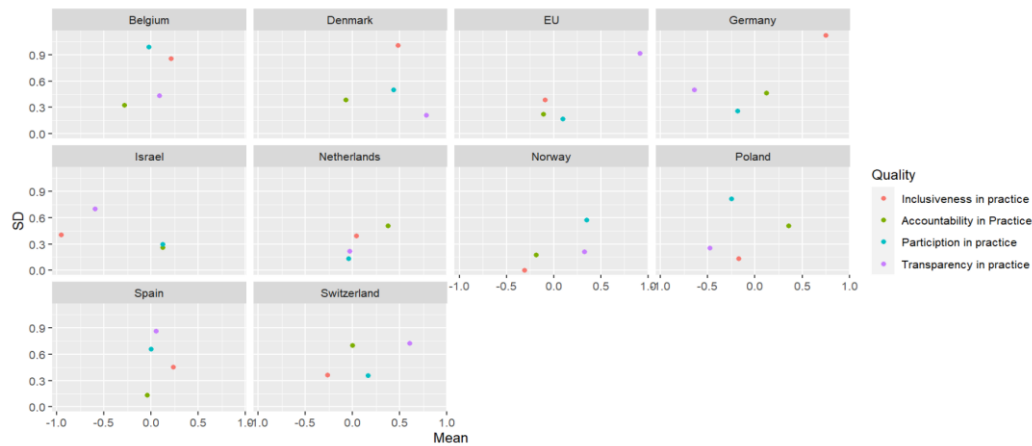


Figure 11: Association between de-facto quality means and standard deviations, by country

B. Sectorial differences

Now, we compare the mean scores and standard deviation of the formal measures across the different sectors. Figure 12 shows that the bodies in the food safety sector have lower formal accountability comparing to the data protection and financial sector. This sector also has the lowest transparency de-facto levels (Figure 13). The highest level of transparency de-facto is found in the financial sector which also is high on formal transparency, participation and accountability.

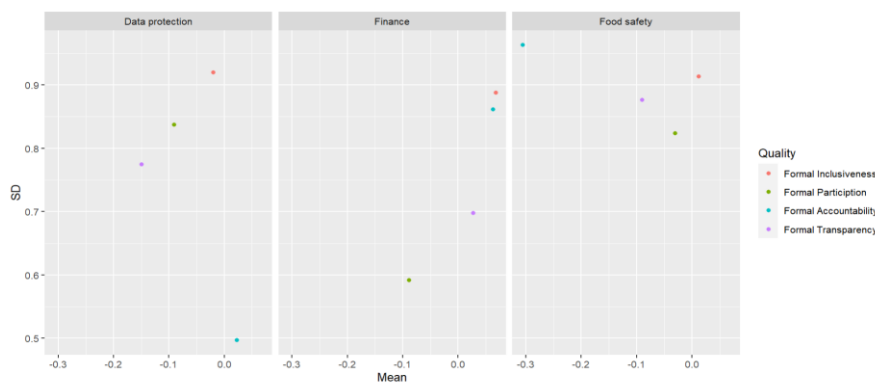


Figure 12: Association between formal quality means and standard deviations, by sector

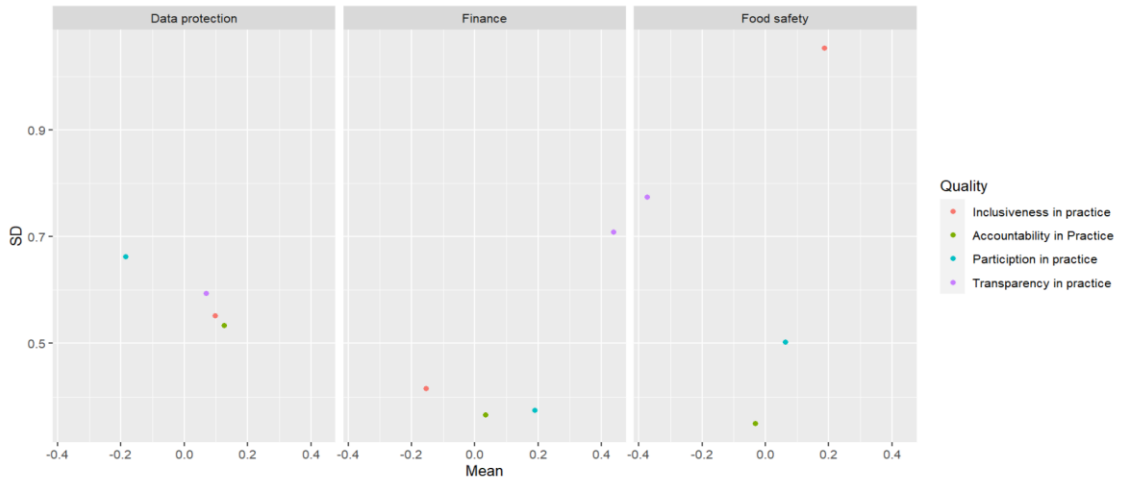


Figure 13: Association between de-facto mechanism means and standard deviations, by sector

Figures 14-17 includes a side-by-side comparison of formal and de-facto qualities by countries. It assists us in exploring formal/de-facto decoupling.

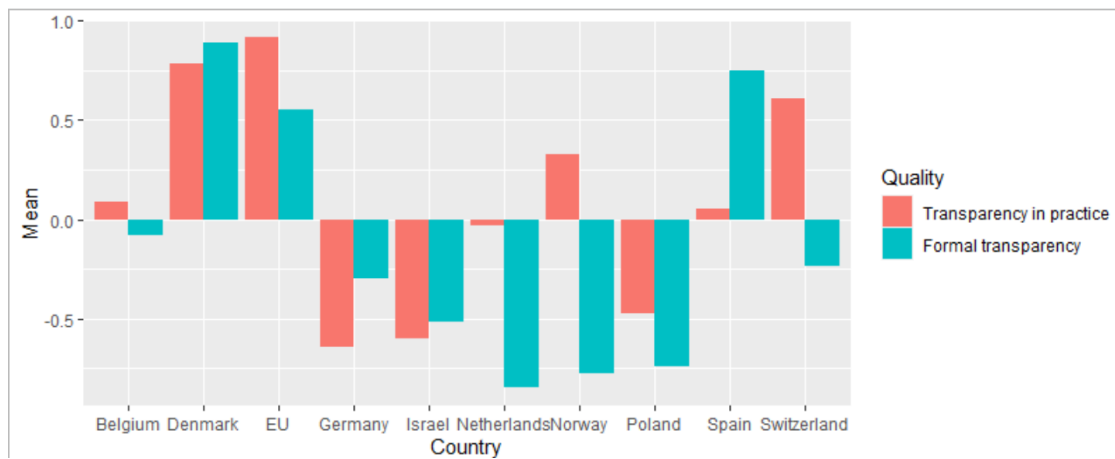


Figure 14: Transparency formal/de-facto decoupling

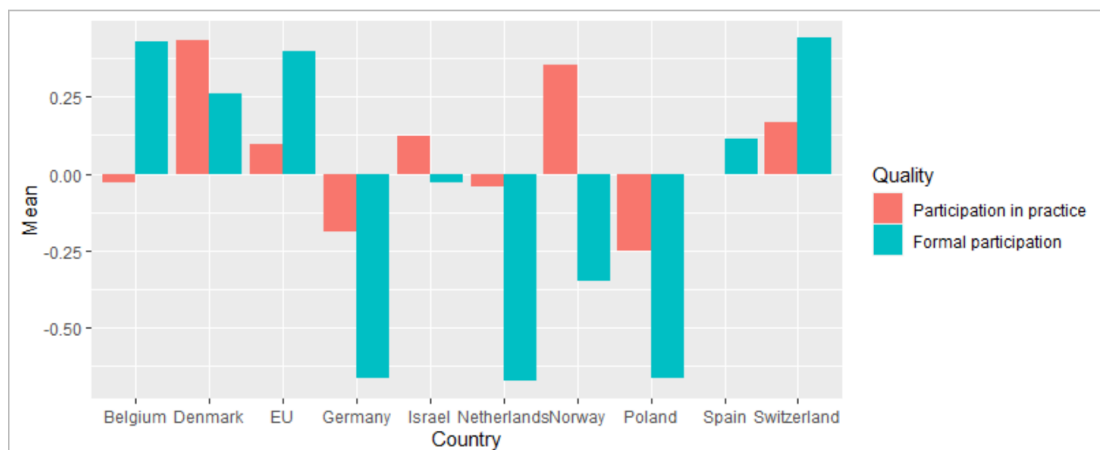


Figure 15: Participation formal/de-facto decoupling

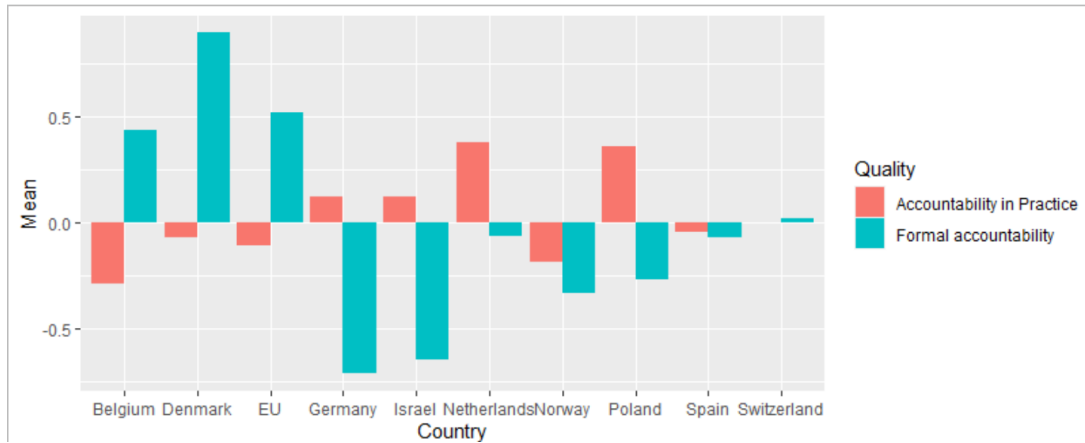


Figure 16: Accountability formal/de-facto decoupling



Figure 17: Inclusiveness formal/de-facto decoupling

These figure shows that in some countries there is a **positive decoupling** as in higher scores in formal mechanisms come with higher scores in de-facto. For example – this positive decoupling occurs in Denmark (Inclusiveness, participation and transparency), Spain (inclusiveness and accountability), Switzerland (participation), and the EU bodies (participation and transparency).

In some countries there is a **negative decoupling** (lower scores in formal mechanisms come with lower de-facto scores). Such as Poland (inclusiveness), Norway (accountability), Germany (participation and transparency) and Israel (transparency).

On the other hand, in some cases we observe a trade-off dynamic. In some cases, this dynamic implies a **compensation** – when there is less formal obligation and more de-facto institutional mechanisms of democratic qualities. Such compensation is visible in Germany and Belgium for inclusiveness, Poland, Germany and Israel for accountability, Norway for transparency and participation and Switzerland for transparency.

Sometimes there is a **derailing** trade-off, where the agency has a positive score on the formal dimension and a negative score on the de-facto dimension. Implying that the regulatory body is doing less than it is obliges to do. This is not found at all in transparency and almost never for participation

(except of Belgium). It is found in several cases in accountability (Belgium, Denmark, EU) and inclusiveness (Switzerland, Norway and Israel).

V. EXPLORING RELATIONSHIP BETWEEN FORMAL AND DE-FACTO QUALITIES AND POLITICAL INDEPENDENCE AND MANAGERIAL AUTONOMY

In this section we will explore the relationship between political independence and managerial autonomy and democratic qualities. Figures 15-18 shows the association between formal mechanisms and Independence_Autonomy, which is the mean score of political independence and managerial autonomy for each regulatory body estimated through an IRT analysis similar to the democratic qualities measure. These graphs show no special relationship between formal transparency and participation and political independence and managerial autonomy. However, for formal accountability there is a slightly positive relationship (Figure 17) and for formal inclusiveness there is a slightly negative relationship (Figure 18).

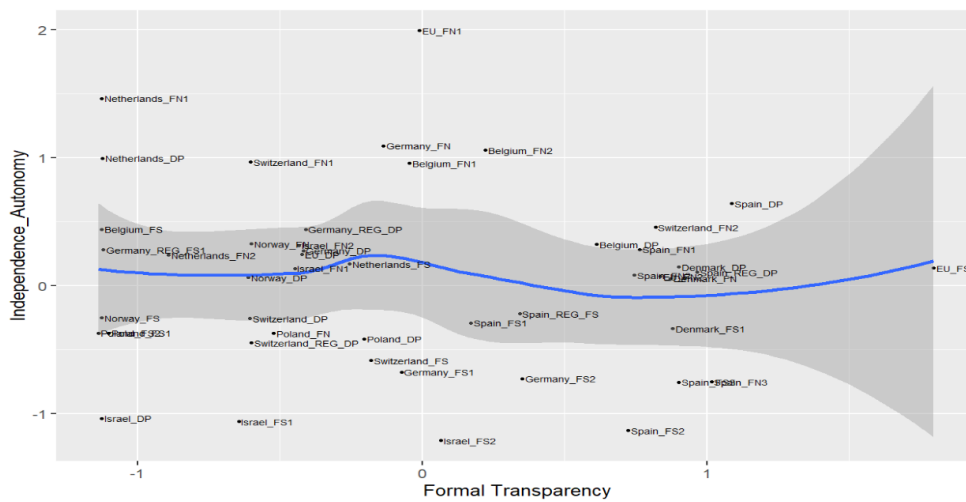


Figure 18: Association between formal transparency and the mean of political independence and managerial autonomy

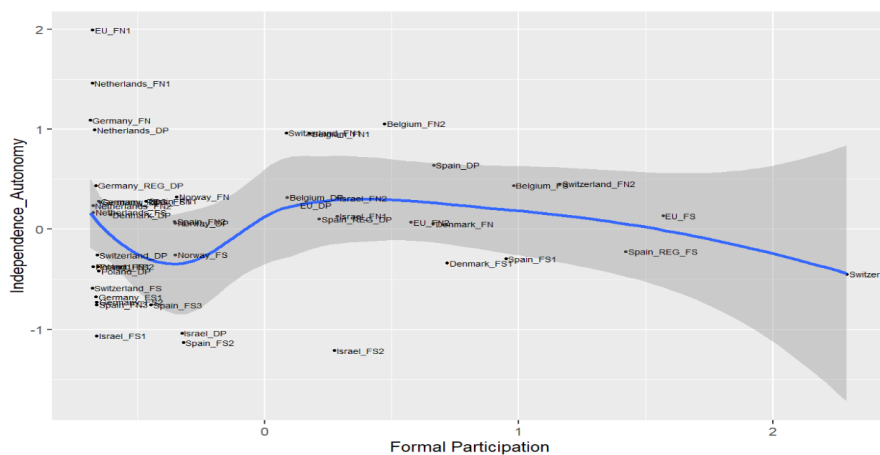


Figure 19: Association between formal participation and the mean of political independence and managerial autonomy

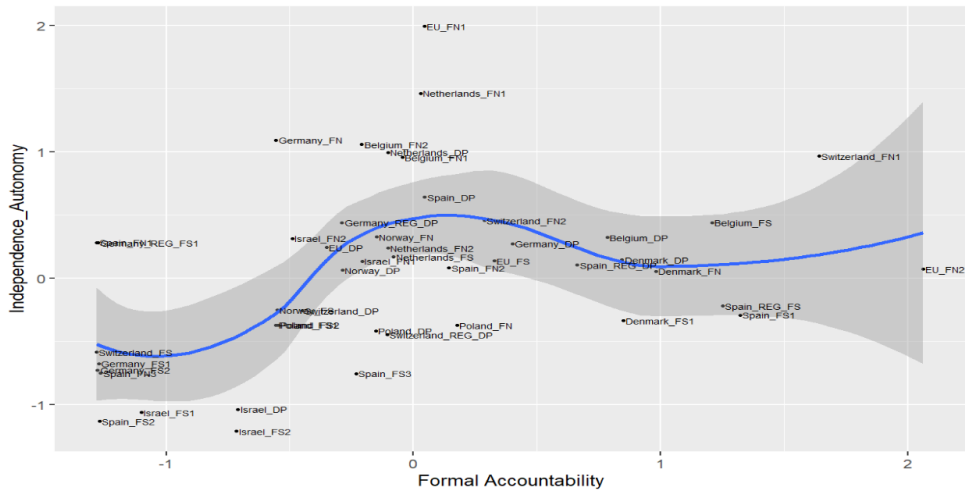


Figure 20: Association between formal accountability and the mean of political independence and managerial autonomy

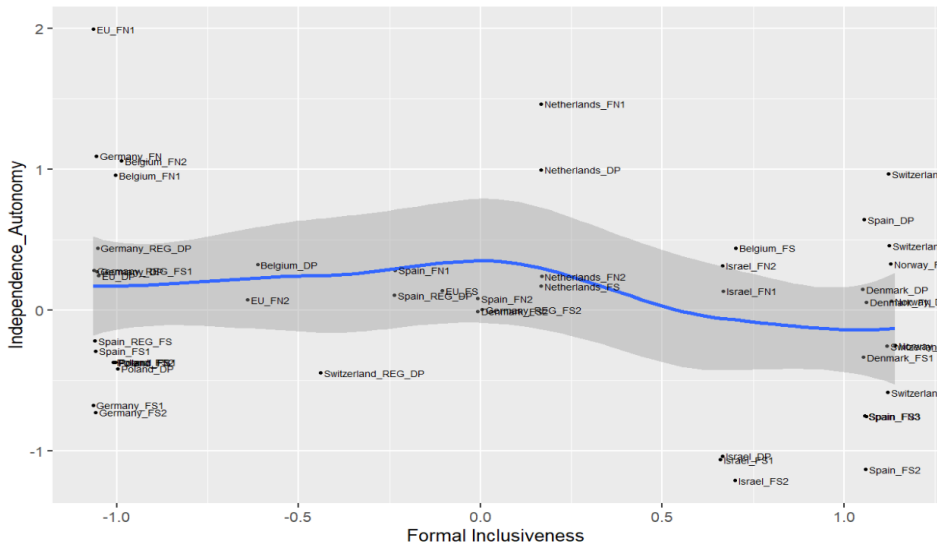


Figure 21: Association between formal inclusiveness and the mean of political independence and managerial autonomy

When we observe the relationship between de-facto democratic qualities and the mean of political independence and managerial autonomy (Figure 19-22), we see a positive relationship for transparency, and inclusiveness.

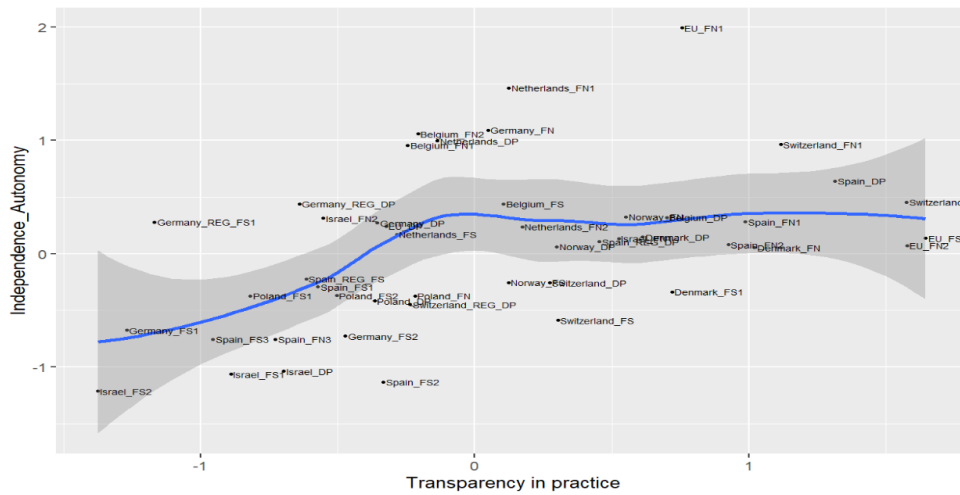


Figure 22: Association between transparency de-facto and the mean of political independence and managerial autonomy

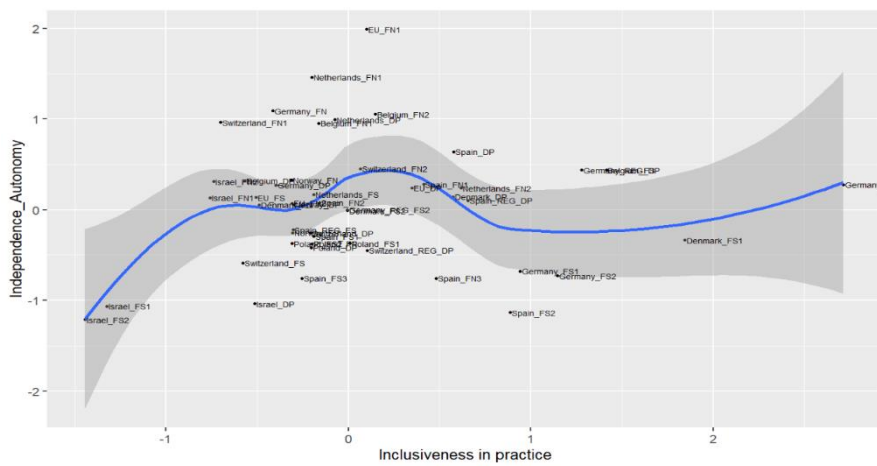


Figure 23: Association between inclusiveness de-facto and the mean of political independence and managerial autonomy

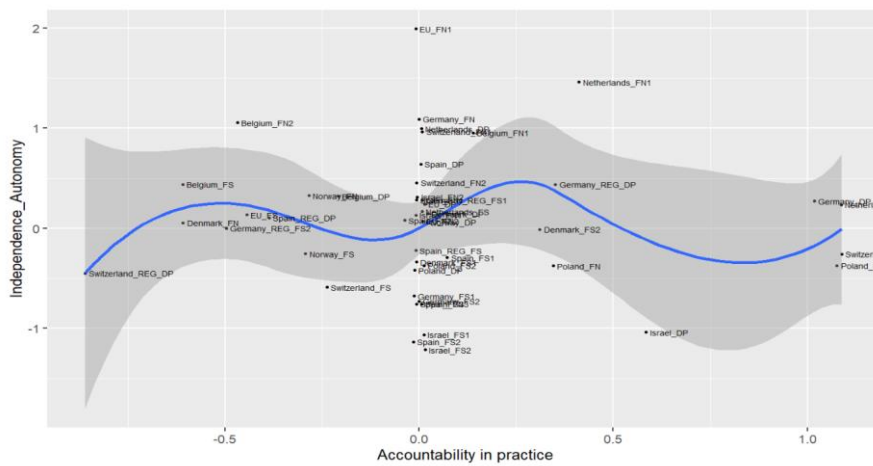


Figure 24: Association between accountability de-facto and the mean of political independence and managerial autonomy

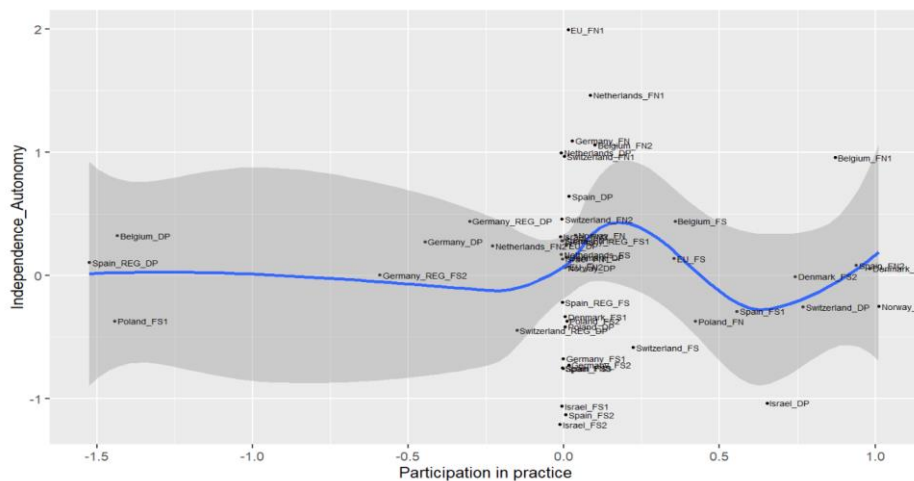


Figure 25: Association between participation de-facto and the mean of political independence and managerial autonomy

VI. CONCLUSIONS

This paper validates eight measures of formal and de-facto transparency, accountability, inclusiveness and participation of regulatory bodies. The validation was done using a Bayesian analysis and data from a novel database covering 49 regulatory bodies in 9 different countries and 3 sectors. Our analysis revealed that despite our prior expectations (previous measures), some index items are unrelated to a single unidimensional latent trait of the democratic qualities. After removing these items and re-modeling the data, we were able to compute an estimated score for each regulatory body in our database for each of the eight qualities. This enables to compare the qualities within and between agencies and to explore the difference between formal obligations and de-facto practice of these qualities by agencies.

An exploration of the findings shows that Israel, Norway, Poland, Netherland, and Germany – have lower formal democratic qualities and EU and Denmark have the highest formal ones We also find that there are sectorial differences. Formal obligation for transparency and transparency de-facto is the highest in the financial sector. Transparency de-facto is the lowest for food safety. Formal accountability is the lowest in the food safety sector and Data protection sector have the lowest participation de-facto.

We also explored Formal/ de-facto decoupling and found 4 main dynamics. A positive decoupling, a negative decoupling a compensation trade-off and a derailing trade-off. The data shows that all four decoupling dynamics occur, though in different extents.

Finally, in terms of the relationship between these mechanisms and political independence and managerial autonomy, we find mostly no special relationship. However, we did find a positive relationship in the case of formal accountability and de-facto transparency and inclusiveness. We also find a negative relationship in the case of formal inclusiveness.

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Appendices

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VII. APPENDIX 1: INDICATORS FOR DATABASE ON DEMOCRATIC QUALITIES

A. Formal transparency

VARIABLE	LABEL	MEASURING LEVEL
STRATEGIC_REP_DEF	The website includes strategic plans	Polytomous (3)
ACTIV_REP_DEF	The website includes annual reports	Polytomous (3)
FINAN_REP_DEF	The website includes financial reports	Polytomous (3)
ENFORC_DEF	The website includes board resolutions /enforcement decisions	Dichotomous
ORGAN_STRUC_DEF	The website includes the organizational structure of the organization	Dichotomous
PERSON_INFO_DEF	The website includes information on agency personnel	Polytomous (5)
REQUEST_INFO_DEF	The website includes a system for the public to request information on the organization	Dichotomous
METHOD_DEF	The website includes methodological guidelines that should guide the agency in the development of new regulations	Dichotomous
METHODO_EX_DEF	The website includes methodological guidelines that should guide the agency in the enforcement of existing rules	Dichotomous
CODE_COND_DEF	The website includes the organization's code of conduct	Dichotomous
MEDIA_INFO	The agency produces and publishes on its website media briefs regarding informational data.	Dichotomous
MEDIA_PROC	The agency produces and publishes on its website media briefs regarding procedural data.	Dichotomous
MEDIA_SUB	The agency produces and publishes on its website media briefs regarding substantive – justification data	Dichotomous
MANAG_BOAR D_MIN_DEF	The website includes the minutes or records of the managing board	Polytomous (5)
ADVIS_BOARD_MIN_DEF	The website includes the minutes or records of the advisory board/stakeholder group	Polytomous (5)
JUST_REG	The agency includes explanatory material to the publication of new regulations	Polytomous (3)
JUST_DEC	The agency includes explanatory material to the publication of new decisions	Polytomous (3)
SOCIAL_MEDIA_TOTAL	The number of social platform accounts that the agency holds	Numerical

TWITTER	Does the agency hold a Twitter account?	Dichotomous
FACEBOOK	Does the agency hold a Facebook account?	Dichotomous
YOUTUBE	Does the agency hold a Youtube account?	Dichotomous
INSTAGRAM	Does the agency hold an Instagram account?	Dichotomous
LINKEDIN	Does the agency hold a LinkedIn account?	Dichotomous
SOCIAL_MEDIA_FOLLOWERS	Number of followers in overall accounts	Numerical

B. Transparency in practice

VARIABLE	LABEL	MEASURING LEVEL
STRATEGIC_REP_DEF	The website includes strategic plans	Polytomous (3)
ACTIV_REP_DEF	The website includes annual reports	Polytomous (3)
FINAN_REP_DEF	The website includes financial reports	Polytomous (3)
ENFORC_DEF	The website includes board resolutions /enforcement decisions	Dichotomous
ORGAN_STRUC_DEF	The website includes the organizational structure of the organization	Dichotomous
PERSON_INFO_DEF	The website includes information on agency personnel	Polytomous (5)
REQUEST_INFO_DEF	The website includes a system for the public to request information on the organization	Dichotomous
METHOD_DEF	The website includes methodological guidelines that should guide the agency in the development of new regulations	Dichotomous
METHODO_EX_DEF	The website includes methodological guidelines that should guide the agency in the enforcement of existing rules	Dichotomous
CODE_COND_DEF	The website includes the organization's code of conduct	Dichotomous
MEDIA_INFO	The agency produces and publishes on its website media briefs regarding informational data.	Dichotomous
MEDIA_PROC	The agency produces and publishes on its website media briefs regarding procedural data.	Dichotomous
MEDIA_SUB	The agency produces and publishes on its website media briefs regarding substantive – justification data	Dichotomous
MANAG_BOARD_MIN_DEF	The website includes the minutes or records of the managing board	Polytomous (5)
ADVIS_BOARD_MIN_DEF	The website includes the minutes or records of the advisory board/stakeholder group	Polytomous (5)

JUST_REG	The agency includes explanatory material to the publication of new regulations	Polytomous (3)
JUST_DEC	The agency includes explanatory material to the publication of new decisions	Polytomous (3)
SOCIAL_MEDIA_TOTAL	The number of social platform accounts that the agency holds	Numerical
TWITTER	Does the agency hold a Twitter account?	Dichotomous
FACEBOOK	Does the agency hold a Facebook account?	Dichotomous
YOUTUBE	Does the agency hold a Youtube account?	Dichotomous
INSTAGRAM	Does the agency hold an Instagram account?	Dichotomous
LINKEDIN	Does the agency hold a LinkedIn account?	Dichotomous
SOCIAL_MEDIA_FOLLOWERS	Number of followers in overall accounts	Numerical

C. Formal Participation

VARIABLE	LABEL	MEASURING LEVEL
HEARING_FOR	There is a legal obligation to consult actors on enforcement decisions	Polytomous (4)
QUALI_FOR	There is a legal obligation to perform qualitative practices that include external actors in the decision making	Polytomous (4)
QUANTI_FOR	There is a legal obligation to perform quantitative practices that include external actors in the decision making	Polytomous (4)
PROPOS_FOR	There is a legal obligation to consult actors on regulations before their adoption	Polytomous (4)
OPEN_BOARD_FOR	There is a legal obligation to have open board meetings	Polytomous (4)

D. Participation in practice

VARIABLE	LABEL	MEASURING LEVEL
HEARING_DEF	The agency consults actors on enforcement decisions	Polytomous (4)
HEARING_DEF_FREQ	The frequency of this practice	Polytomous (3)
QUALI_DEF	The agency performs qualitative practices that include external actors in the decision making	Polytomous (4)
QUALI_FREQ	The frequency of this practice	Polytomous (3)

QUANTI_DEF	The agency performs quantitative practices that include external actors in the decision making	Polytomous (4)
QUALI_FREQ	The frequency of this practice	Polytomous (3)
PROPOS_DEF	The agency consults actors on regulations before their adoption	Polytomous (4)
PROPOS_FREQ	The frequency of this practice	Polytomous (3)
OPEN_BOARD_DEF	The agency has open board meetings	Polytomous (4)
OPEN_BOARD_FREW	The frequency of this practice	Polytomous (3)

E. Formal accountability

VARIABLE	LABEL	MEASURING LEVEL
PARL_PLAN_FOR	There is a legal obligation to submit a strategic plan to the executive branch	Polytomous (3)
PARL_ACT_FOR	There is a legal obligation to submit an annual activity report to the legislative	Dichotomous
PARL_FINA_FOR	There is a legal obligation to submit an annual finance report to the legislative	Dichotomous
PARL_ADHOC_FORWRITTEN	There is a legal obligation to report the actions of the agency on an ad-hoc basis (on request) to the legislative in a WRITTEN format	Dichotomous
PARL_ADHOC_FORHEARING	There is a legal obligation to report the actions of the agency on an ad-hoc basis (on request) to the legislative in a HEARING format	Dichotomous
EXEC_PLAN_FOR	There is a formal obligation to submit a strategic plan to the executive	Polytomous (3)
EXEC_ACT_FOR	There is a legal obligation to submit an annual activity report to the executive	Dichotomous
EXEC_FINA_FOR	There is a legal obligation to submit an annual finance report to the executive	Dichotomous
EXEC_ADHOC_FORWRITTEN	There is a legal obligation to report the actions of the agency on an ad-hoc basis (on request) to the executive in a WRITTEN format	Dichotomous
EXEC_ADHOC_FORHEARING	There is a legal obligation to report the actions of the agency on an ad-hoc basis (on request) to the executive in a HEARING format	Dichotomous
SPEND_FOR	The agency is obliged to report public spending's to an audit office	Dichotomous

F. Accountability in practice

VARIABLE	LABEL	MEASURING LEVEL
APPEAL_DEF	Does the agency have a board of appeal operative	Dichotomous
COMPLAINT_DEF	Does the agency have a system to submit complaints on the website	Dichotomous
PARL_DEF	How frequent does the agency appear for parliamentary hearings	Polytomous (5)
EXEC_DEF	How frequent does the agency meet with parent ministry	Polytomous (5)
CONSUMER_DEF	Is there a consumer protection/complaint unit on regulated firms in the agency?	Dichotomous

G. Formal inclusiveness

VARIABLE	LABEL	MEASURING LEVEL
LANG_USE	There is a legal obligation to use some languages	Dichotomous
GEND_FOR	There is a legal obligation to promote gender equality in the agency personnel	Dichotomous
NO_DIS_MINO	The legal framework emphasizes non-discrimination (related to minorities) in the appointment procedures of agency officials	Polytomous (3)
NO_DIS_GEN_AGENCY	The legal framework emphasizes non-discrimination (related to gender) in the appointment procedures of agency officials	Dichotomous
NO_DIS_GEN_BOARD	The legal framework emphasizes non-discrimination (related to gender) in the appointment procedures of board members	Dichotomous
GEO_BOARD_FOR	Is there a legal obligation for geographical representation in the management board	Dichotomous
CIT_REP_BOARD_FOR	There is a legal obligation to include citizens/consumers groups/NGOs representatives in the management board	Dichotomous
PERCENTAGE_CIT_BOARD_FOR	Please specify the percentage of citizens/consumers groups/NGOs representatives the managing board should have according to legal obligation	Numerical
REG_REP_BOARD_FOR	There is a legal obligation to include firms/business associations/employers representation in the agency board	Dichotomous
PERCENTAGE_REG_BOARD_FOR	Please specify the percentage of firms/business associations/employers representatives the managing board should have according to legal obligation	Numerical
PRO_REP_BOARD_FO	There is a legal obligation to include scientific or professional organizations representation in the management board	Dichotomous
PERCENTAGE_PRO_BOARD_FOR	Please specify the percentage of scientific or professional organizations representatives the management board should have according to legal obligation	Numerical
TRADE_REP_BOARD_FO	There is a legal obligation to include trade unions representation in the managing board	Dichotomous

PERCENTAGE _TRADE_BOARD_FOR	Please specify the percentage of trade unions representatives the management board should have according to legal obligation	Numerical
GEND_ADVIS_FOR	There is a legal obligation for gender equality in the advisory board/stakeholder group	Dichotomous
GEO_ADVIS_FOR	Is there a legal obligation for geographical representation in the advisory board/stakeholder group	Dichotomous
CIT_REP_ADVIS_FOR	There is a legal obligation to include citizens/consumers groups/NGOs representatives in the advisory board/stakeholder group	Dichotomous
PERCENTAGE _CIT_ADVIS_FOR	Please specify the percentage of citizens/consumers groups/NGOs representatives the advisory board/stakeholder group should have according to legal obligation	Numerical
REG_REP_ADVIS_FOR	There is a legal obligation to include firms/business associations/employers representation in the advisory board/stakeholder group	Dichotomous
PERCENTAGE _REG_ADVIS_FOR	Please specify the percentage of firms/business associations/employers representatives the advisory board/stakeholder group should have according to legal obligation	Numerical
PRO_REP_ADVIS_FO	There is a legal obligation to include scientific or professional organizations representation in the advisory board/stakeholder group	Dichotomous
PERCENTAGE _PRO_ADVIS_FOR	Please specify the percentage of scientific or professional organizations representatives the advisory board should have according to formal obligation	Numerical
TRADE_REP_ADVIS_FO	There is a formal obligation to include trade unions representation in the advisory board	Dichotomous
PERCENTAGE _TRADE_ADVIS_FOR	Please specify the percentage of trade unions representatives the advisory board should have according to legal obligation	Numerical

H. Inclusiveness in practice

VARIABLE	LABEL	MEASURING LEVEL
LANG_DEF	The agency website has information in more than one language - the mean score of the polytomous scores for each language: 0-No 1 -Only on main website page, or on very few pages 2-Yes-on regulations and official documents 3- Yes – extensively	Numerical
PERCENTAGE_GEN_BOARD	The percentage of women in agency management board	Numerical
GEND_BOARD_DEF	The percentage of women in agency other boards - advisory etc	Numerical
GEND_BIODATA	Percentage of women in overall agency - boards and managerial level (from biographical dataset)	Numerical
GEND_CODE_DEF	The agency has additional regulations to ensure gender equality	Dichotomous

MINO_CODE_DEF	The agency has additional regulations to ensure minority equality	Dichotomous
----------------------	---	-------------

I. Political independence

VARIABLE	LABEL	MEASURING LEVEL
BO_REQ	Agency board membership professional requirement	Dichotomous
HED_RED	Agency head professional requirement	Dichotomous
MB_TERM	Agency board term of office	Numerical
HE_TERM	Agency head term of office	Numerical
MB_AP	Agency board membership appointment	Polytomous (7)
MB_DIS	Agency board membership dismissal	Polytomous (4)
MB_REN	Agency board membership renewal	Polytomous (4)
HEAD_APP	Agency head appointment	Polytomous (4)
HEAD_DIS	Agency head dismissal	Polytomous (4)
HEAD_REN	Agency head renewal	Polytomous (4)
HOLD_OF	Holding offices in government	Polytomous (4)

J. Managerial autonomy

VARIABLE	LABEL	MEASURING LEVEL
BUD_AP	Budget approval	Polytomous (4)
BUD_CON	Budget control	Polytomous (5)
BUD_INC	Budget income	Polytomous (4)
ORG_STRUC	Organizational structure	Polytomous (3)
PERS_STA	Personal status	Polytomous (3)
PERS_POL	Personnel policy	Polytomous (3)

VIII. APPENDIX 2: INTERVIEW QUESTIONS FOR AGENCY OFFICIALS



MODULE 5. Questionnaire for external relations or communication officers in the regulatory agency

Note: this is a questionnaire to be answered **ONLY** by external relations or communication officers of each regulatory agency (one per agency)

In the questionnaire that we present below, we ask you to please provide us with information regarding the dynamics of participation, consultation and decision-making within your regulatory agency in one of the following sectors: data protection , finances or food security.

1. How frequent does the agency head appear for parliamentary hearings?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

2. How frequent does the agency head meet with the parent ministry?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

3. Does the agency consult different actors on proposed regulations before their formal adoption?

- Yes*
- No*

a) Which are the channels employed?

For instance, open consultation, hearings or other formal channels (Note to interviewer: only mention these examples for clarification)

b) Which actors are usually invited/consulted?

- No external actors are invited*
- Regulated firms / Parties of interest*
- Business interest groups*
- Consumer/Citizens' interest groups*
- General public*

c) How frequent do these consultations occur?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

4. Does the agency consult stakeholders before making an enforcement decision?

- Yes
- No

a) Which are the channels employed?

For instance, open consultation, hearings or other formal channels (Note to interviewer: only mention these examples for clarification)

b) Which actors are usually invited/consulted?

- No external actors are invited*
- Regulated firms / Parties of interest*
- Business interest groups*
- Consumer/Citizens' interest groups*
- General public*

c) How frequent do these consultations occur?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

5. Does the agency perform interactive practices that include external actors in the decision making (such as focus groups, round tables, deliberative procedures)?

- Yes
- No

a) Which are these practices?

b) Which actors are usually invited to participate in these practices?

- No external actors are invited*
- Regulated firms / Parties of interest*

- Business interest groups*
- Consumer/Citizens' interest groups*
- General public*

c) How frequent do these practices occur?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

6. Does the agency conduct surveys to obtain information from stakeholders and regulated firms as an input for its decision-making?

- Yes*
- No*

a) On which issues does the agency perform surveys?

b) Which actors are usually invited to participate in these surveys?

- No external actors are invited*
- Regulated firms / Parties of interest*
- Business interest groups*
- Consumer/Citizens' interest groups*
- General public*

c) How frequent do these surveys occur?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

7. Does the agency have open board meetings?

- Yes*

No

a) Which actors are usually invited to participate in these meetings?

- No external actors are invited*
- Regulated firms / Parties of interest*
- Business interest groups*
- Consumer/Citizens' interest groups*
- General public*

b) How frequent do these meetings occur?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

8. Does the agency have an advisory/consultation board?

- Yes
- No

a) How often do they meet?

- Never*
- Less than once per year*
- Once a year*
- 2-3 times a year*
- 4-6 times a year*
- More than 6 times a year*

b) How is attendance on average?

- 50% of the invited stakeholders*
- 75% of the invited stakeholders*
- 100% of the invited stakeholders*

9. Is there a consumer protection/complaint unit on regulated firms in the agency?

- Yes
- No

a) How does it operate, please detail (responsible unit? Are there resources exclusively dedicated to this element? Is there monitoring on complaints?)

b) How is this unit coordinated with the rest of the agency?

10. Is there a process to complain on the agency's performance?

- Yes
- No

a) How does it operate, please detail (responsible unit, resources, monitoring)

11. How social media is managed within the agency?

How does it operate? please detail (Is there a responsible unit? Are there resources exclusively dedicated to this element? Is there monitoring on social media activity?)

Additional questions on trust and stakeholders (control questions)

12. How would you describe the relationship between your agency and stakeholders (i.e., regulated firms, business interest groups, consumer/citizen interest groups)? Please specify to which type of stakeholder you are referring to.

(Note for the interviewer, only for clarification) Are these relationships cooperative? Are they conflictive?

IX. APPENDIX 3: ITEM DISCRIMINATION FOR EACH QUALITY (AND RELATED CODE)

A. Formal transparency full model

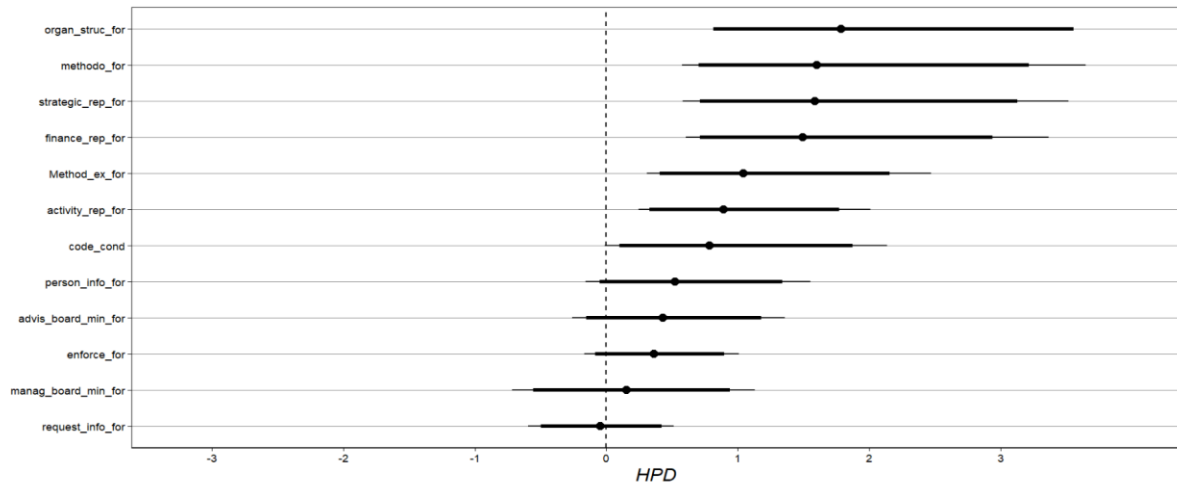
```

10.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
             0.5,
             1,
             0.5,
             0.5,
             0.5,
             0,
             0.5,
             0,
             0.5,
             0,
             0,
             0
            )
dim(10.prior) <- c(12,2)

FT.mcmc <- MCMCordfactanal(~strategic_rep_for+
                           activity_rep_for+
                           finance_rep_for+
                           enforce_for+
                           organ_struct_for+
                           person_info_for+
                           request_info_for+
                           methodo_for+
                           Method_ex_for+
                           code_cond+
                           manag_board_min_for+
                           advis_board_min_for,
                           lambda.constraints =
list(activity_rep_for = list(2,"+")), # Constrain λ2 for
      'activity_rep_for' to be positive

      seed = 1090,
      factors = 1,
      data= FTsubset,
      burnin = 10000,
      mcmc = 1000000,
      thin=100,
      verbose = 10000,
      L0 = 0.25,
      store.lambda = TRUE,
      store.scores = TRUE,
      tune = .25,
      10.prior = 10.prior
      )

```

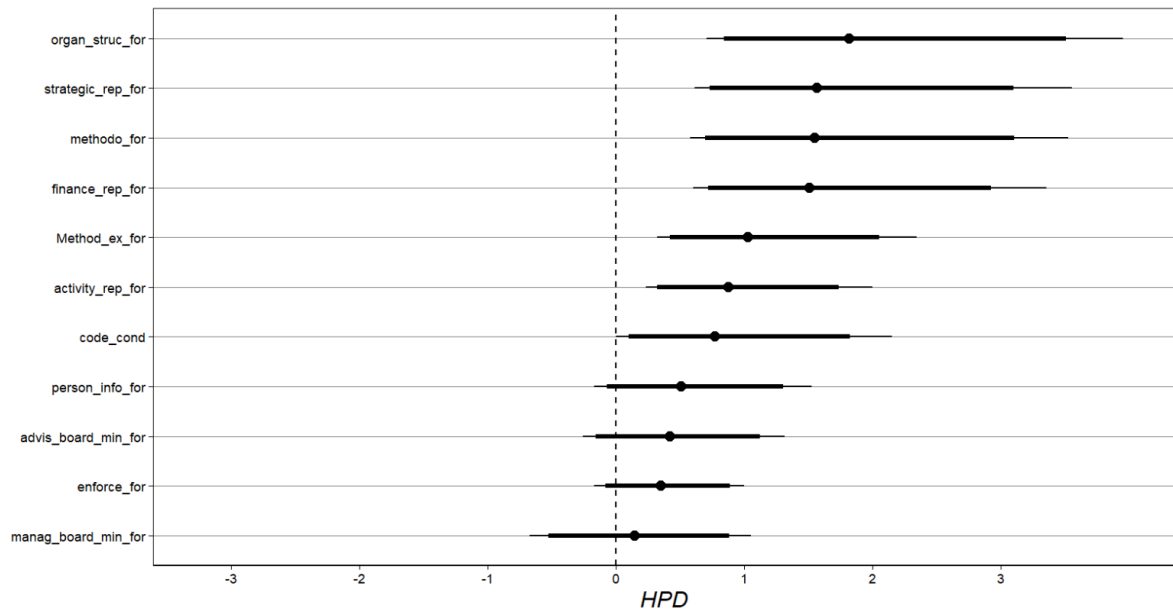



B. Formal transparency revised model

```

FT.mcmc <- MCMCordfactanal(~strategic_rep_for+
  activity_rep_for+
  finance_rep_for+
  enforce_for+
  organ_struc_for+
  person_info_for+
  methodo_for+
  Method_ex_for+
  code_cond+
  manag_board_min_for+
  advis_board_min_for,
  lambda.constraints =
    list(activity_rep_for = list(2,"+")), # Constrain  $\lambda_2$ 
    for 'activity_rep_for' to be positive
  seed = 1090,
  factors = 1,
  data= FTsubset,
  burnin = 10000,
  mcmc = 1000000,
  thin=100,
  verbose = 10000,
  L0 = 0.25,
  store.lambda = TRUE,
  store.scores = TRUE,
  tune = .25,
  10.prior = 10.prior
)

```



C. Transparency in practice full model

```

# Priors
10.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
             0, 0, 0, 0,
             2,
             2,
             2.5,
             1,
             1,
             3,
             0.5,
             0.5,
             0.5,
             1,
             1,
             0.5,
             0,
             0,
             0,
             1.5,
             1.5,
             0.5,
             1,
             0,
             0.5,
             0,
             2,
             7513.2
             )
dim(10.prior) <- c(24,2)

# Chain

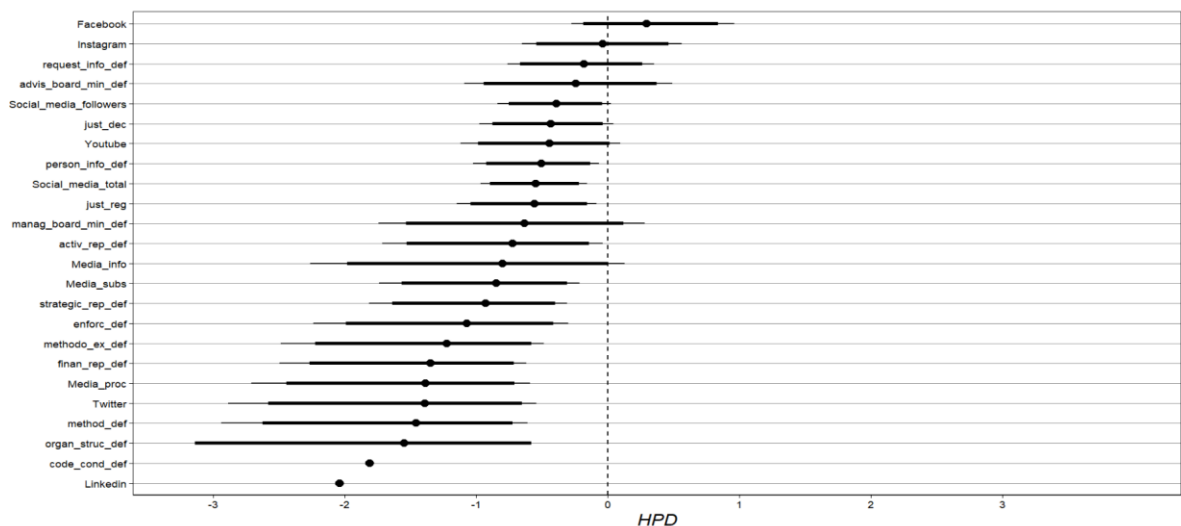
TP.mcmc <- MCMCmixfactanal(~strategic_rep_def+
                           activ_rep_def+
                           finan_rep_def+
                           enforc_def+
                           organ_struc_def+
                           person_info_def+

```

```

request_info_def+
method_def+
methodo_ex_def+
code_cond_def+
Media_info+
Media_proc+
Media_subs+
manag_board_min_def+
advis_board_min_def+
just_reg+
just_dec+
Social_media_total+
Twitter+
Facebook+
Youtube+
Instagram+
Linkedin+
Social_media_followers,
lambda.constraints =
list(stratategic_rep_def_ =
list(2, "+"),
Social_media_total=list(1,0), Social_media_followers= list(1,0)),
seed = 1090,
factors = 1,
data= TPsubset,
burnin = 10000,
mcmc = 1000000,
thin=100,
verbose = 10000,
L0 = 0.25,
store.lambda = TRUE,
store.scores = TRUE,
tune = .25,
10.prior = 10.prior
)

```



D. Transparency in practice revised model

```

# Priors
10.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
2,
2,
2.5,

```

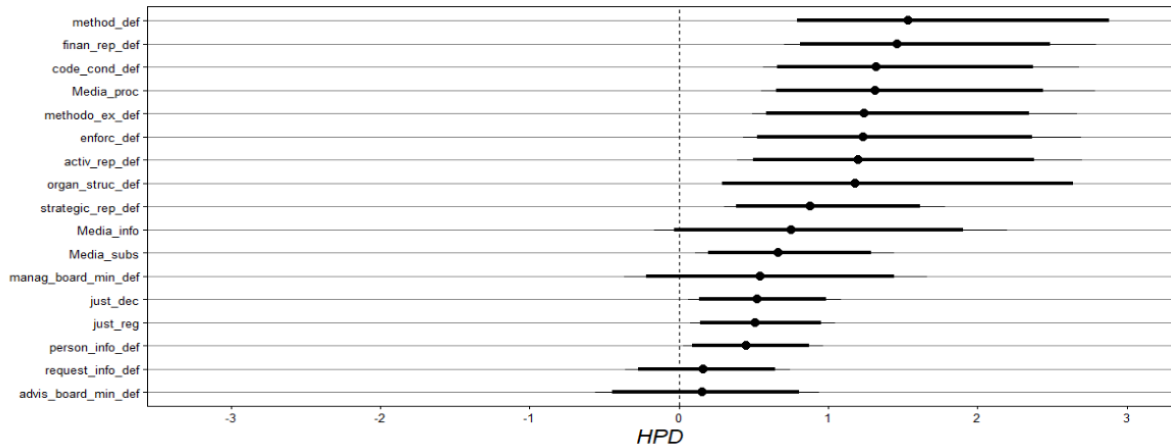
```

1,
1,
3,
0.5,
0.5,
0.5,
1,
1,
0.5,
0,
0,
0,
1.5,
1.5
)
dim(l0.prior) <- c(17,2)

# Chain

TP.mcmc <- MCMCordfactanal(~strategic_rep_def+
  activ_rep_def+
  finan_rep_def+
  enforc_def+
  organ_struc_def+
  person_info_def+
  request_info_def+
  method_def+
  methodo_ex_def+
  code_cond_def+
  Media_info+
  Media_proc+
  Media_subs+
  manag_board_min_def+
  advis_board_min_def+
  just_reg+
  just_dec,
  lambda.constraints =
  list(finan_rep_def =
  list(2,"+")), # Constrain  $\lambda_2$  for
'finan_rep_def' to be positive
  seed = 1090,
  factors = 1,
  data= TPsubset,
  burnin = 10000,
  mcmc = 1000000,
  thin=100,
  verbose = 10000,
  L0 = 0.25,
  store.lambda = TRUE,
  store.scores = TRUE,
  tune = .25,
  l0.prior = l0.prior
)

```



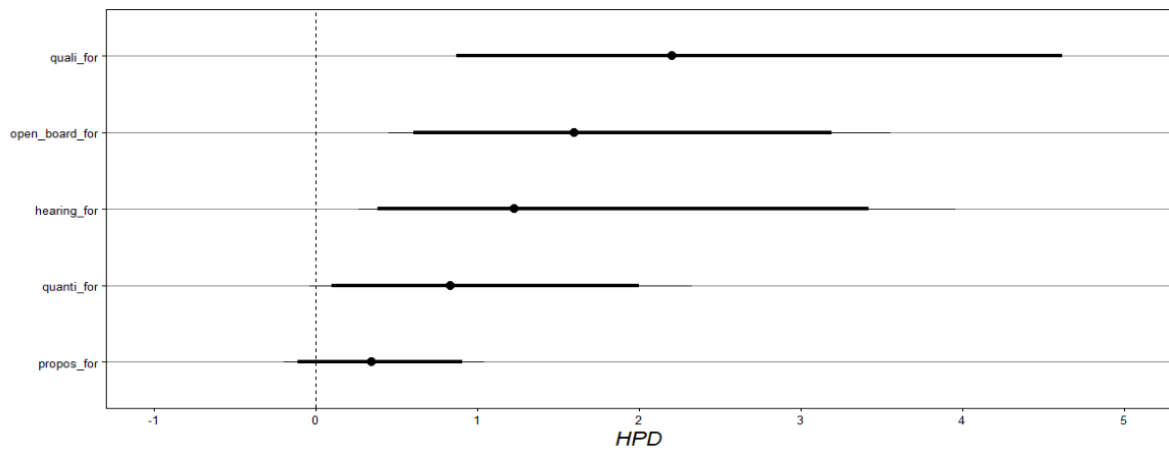
E. Formal participation full model (no revisions needed)

```

# Priors
10.prior <- c(0, 0, 0, 0, 0,
             0,
             0,
             0,
             1.5,
             0
            )
dim(10.prior) <- c(5,2)

# Chain
FP.mcmc <- MCMCordfactanal(~hearing_for+
                           quali_for+
                           quanti_for+
                           propos_for+
                           open_board_for,
                           lambda.constraints =
                             list(quali_for =
                                   list(2,"+")), # Constrain λ2 for
'quali_for' to be positive
                           seed = 1090,
                           factors = 1,
                           data= FPsubset,
                           burnin = 10000,
                           mcmc = 1000000,
                           thin=100,
                           verbose = 10000,
                           L0 = 0.25,
                           store.lambda = TRUE,
                           store.scores = TRUE,
                           tune = .25,
                           10.prior = 10.prior
                           )

```



F. Participation in practice full model

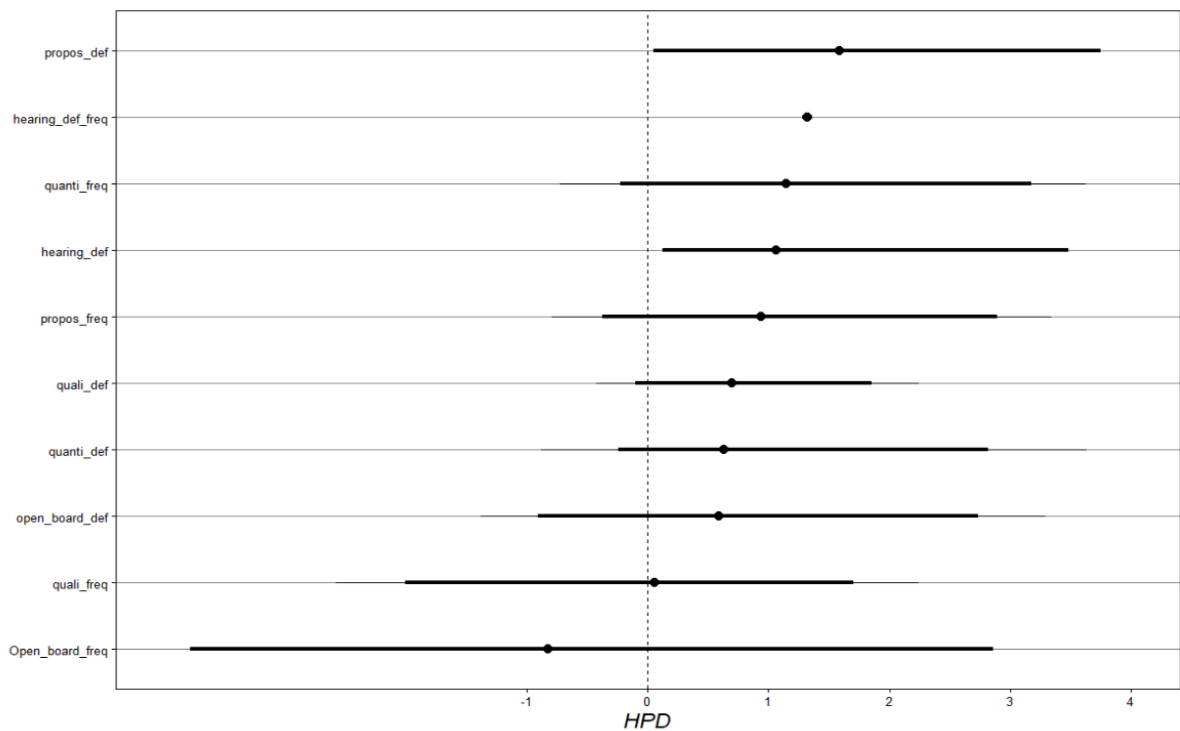
```

10.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
             1.5,
             2,
             1.5,
             2,
             0.5,
             1,
             3,
             2,
             1,
             1
            )
dim(10.prior) <- c(10,2)

# Chain

PP.mcmc <- MCMCordfactanal(~hearing_def+
                          hearing_def_freq+
                          quali_def+
                          quali_freq+
                          quanti_def+
                          quanti_freq+
                          propos_def+
                          propos_freq+
                          open_board_def+
                          Open_board_freq,
                          lambda.constraints =
                            list(hearing_def =
                                  list(2,"+")), # Constrain λ2 for
'hearing_def' to be positive
                          seed = 1090,
                          factors = 1,
                          data= PPsubset,
                          burnin = 10000,
                          mcmc = 1000000,
                          thin=100,
                          verbose = 10000,
                          L0 = 0.25,
                          store.lambda = TRUE,
                          store.scores = TRUE,
                          tune = .25,
                          10.prior = 10.prior
                          )

```



G. Participation in practice revised model

```

10.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
             1.5,
             2,
             1.5,
             0.5,
             1,
             3,
             2,
             1
             )

dim(10.prior) <- c(10,2)

# Chain

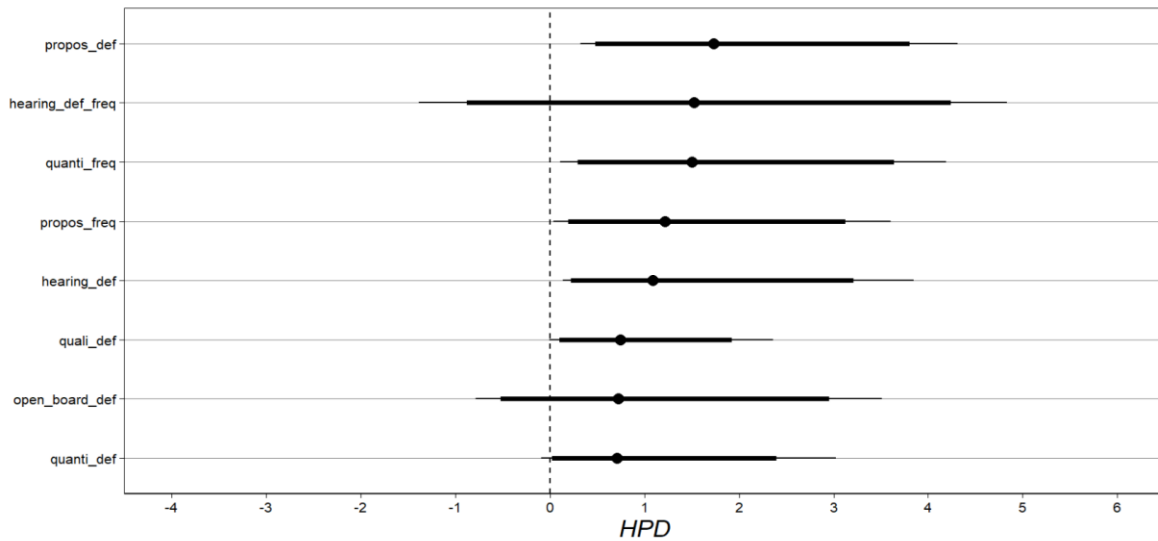
PP.mcmc <- MCMCordfactanal(~hearing_def+
                           hearing_def_freq+
                           quali_def+
                           quanti_def+
                           quanti_freq+
                           propos_def+
                           propos_freq+
                           open_board_def,
                           lambda.constraints =
                             list(hearing_def =
                                   list(2,"+")), # Constrain λ2 for
'hearing_def' to be positive
                           seed = 1090,
                           factors = 1,
                           data= PPsubset,
                           burnin = 10000,
                           mcmc = 1000000,
                           thin=100,
                           verbose = 10000,
                           L0 = 0.25,
                           store.lambda = TRUE,

```

```

store.scores = TRUE,
  tune = .25,
  l0.prior = l0.prior
)

```



H. Formal accountability full model (no revisions needed)

```

l0.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
              0,
              0.5,
              0,
              0.5,
              0,
              0.5,
              1,
              0,
              0,
              0.5,
              0,
              0,
              0
            )
dim(l0.prior) <- c(13,2)

```

Chain

```

FA.mcmc <- MCMCordfactanal(~parl_plan_for+
  parl_act_for+
  parl_fina_for+
  parl_adhoc_forWRITTEN+
  parl_adhoc_forHEARING+
  spend_for+
  exec_plan_for+
  exec_act_for+
  exec_fina_for+
  exec_adhoc_forWRITTEN+
  exec_adhoc_forHEARING,
  lambda.constraints =
  list(parl_adhoc_for =
    list(2, "+")), # Constrain λ2 for
'parl_adhoc_for' to be positive
  seed = 1090,

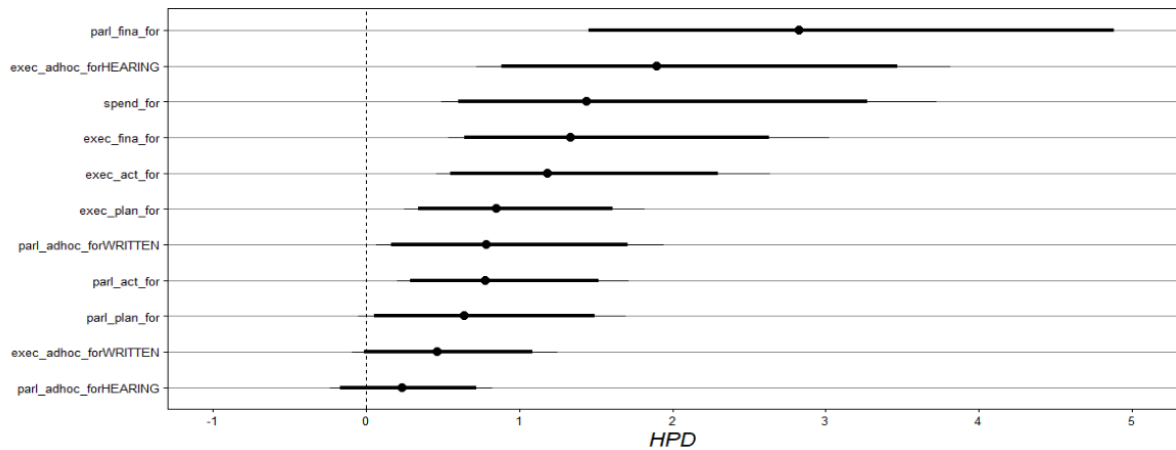
```



```

factors = 1,
data= FASubset,
burnin = 10000,
mcmc = 1000000,
thin=100,
verbose = 10000,
L0 = 0.25,
store.lambda = TRUE,
store.scores = TRUE,
tune = .25,
10.prior = 10.prior
)

```



I. Accountability in practice full model

```

# Priors
10.prior <- c(0, 0, 0, 0, 0,
              3,
              4,
              1,
              0,
              0.5
              )
dim(10.prior) <- c(5,2)

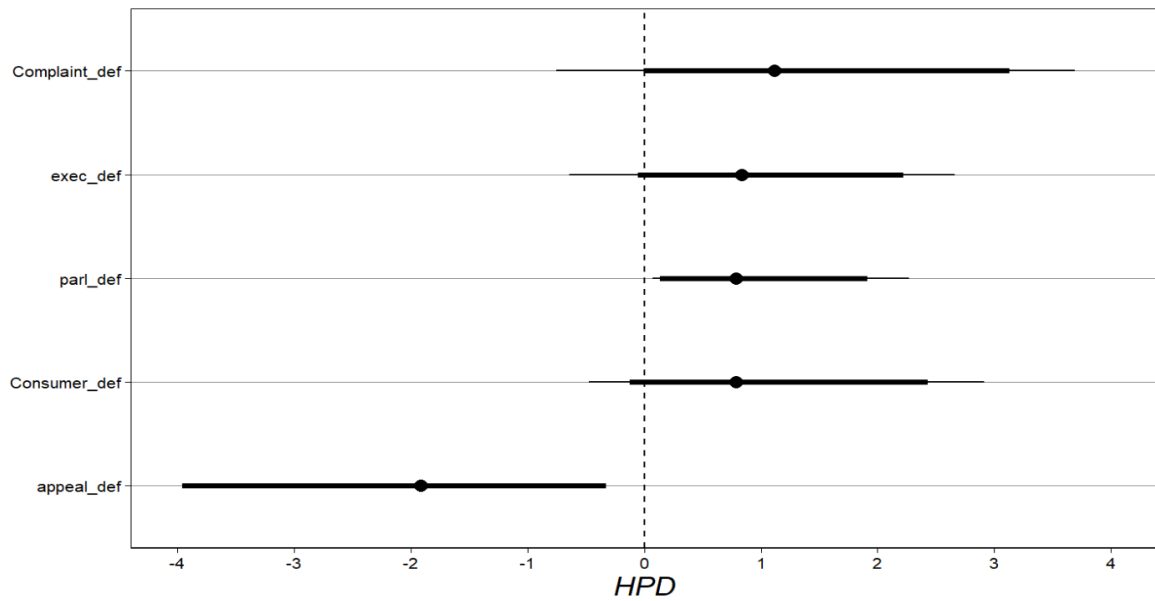
# Chain
AP.mcmc <- MCMCordfactanal(~ parl_def+
                           exec_def+
                           Consumer_def+
                           appeal_def+
                           Complaint_def,
                           lambda.constraints =
                             list(parl_def =
                                   list(2,"+")), # Constrain λ2 for
'parl_def' to be positive
                           seed = 1090,
                           factors = 1,
                           data= APsubset,
                           burnin = 10000,
                           mcmc = 1000000,
                           thin=100,
                           verbose = 10000,
                           L0 = 0.25,
                           store.lambda = TRUE,
                           store.scores = TRUE,

```

```

tune = .25,
10.prior = 10.prior
)

```



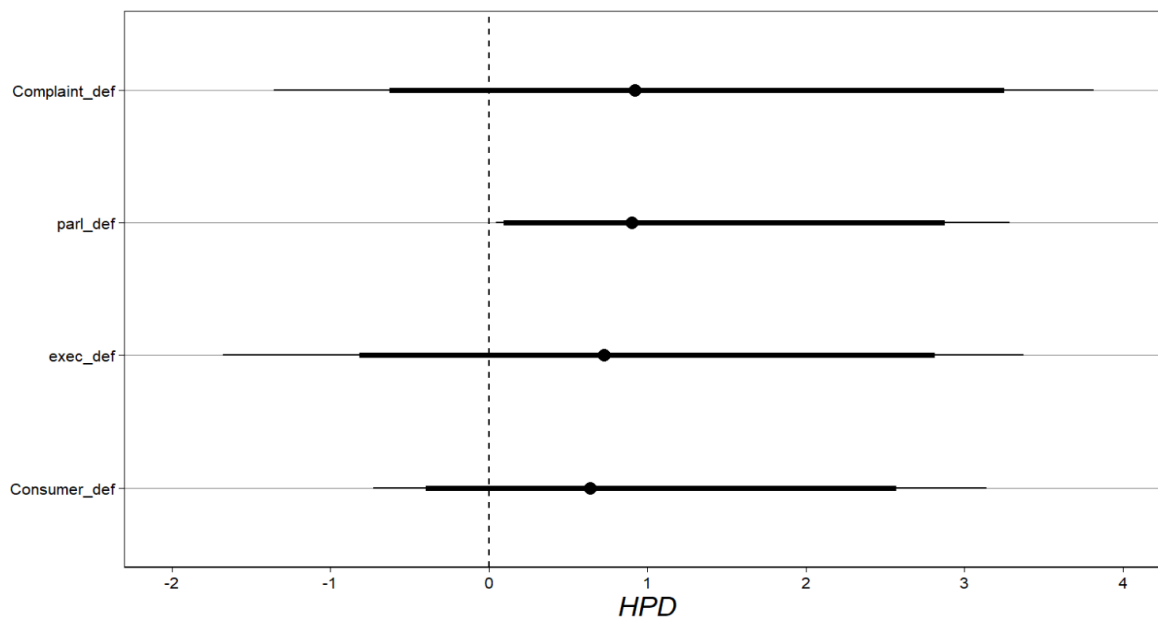
J. Accountability in practice revised model

```

# Priors
10.prior <- c(0, 0, 0, 0,
             3,
             4,
             1,
             0.5
             )
dim(10.prior) <- c(4,2)

# Chain
AP.mcmc <- MCMCordfactanal(~ parl_def+
                          exec_def+
                          Consumer_def+
                          Complaint_def,
                          lambda.constraints =
                            list(parl_def =
                                list(2, "+")), # Constrain λ2 for
'parl_def' to be positive
                          seed = 1090,
                          factors = 1,
                          data= APsubset,
                          burnin = 10000,
                          mcmc = 1000000,
                          thin=100,
                          verbose = 10000,
                          L0 = 0.25,
                          store.lambda = TRUE,
                          store.scores = TRUE,
                          tune = .25,
                          10.prior = 10.prior
)

```



K. Formal inclusiveness full model

```

# Priors
10.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
             0, 0, 0,
             0,
             0.5,
             0.5,
             0,
             0,
             0.5,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             0,
             1,
             0,
             0,
             1,
             1
             )
dim(10.prior) <- c(22,2)

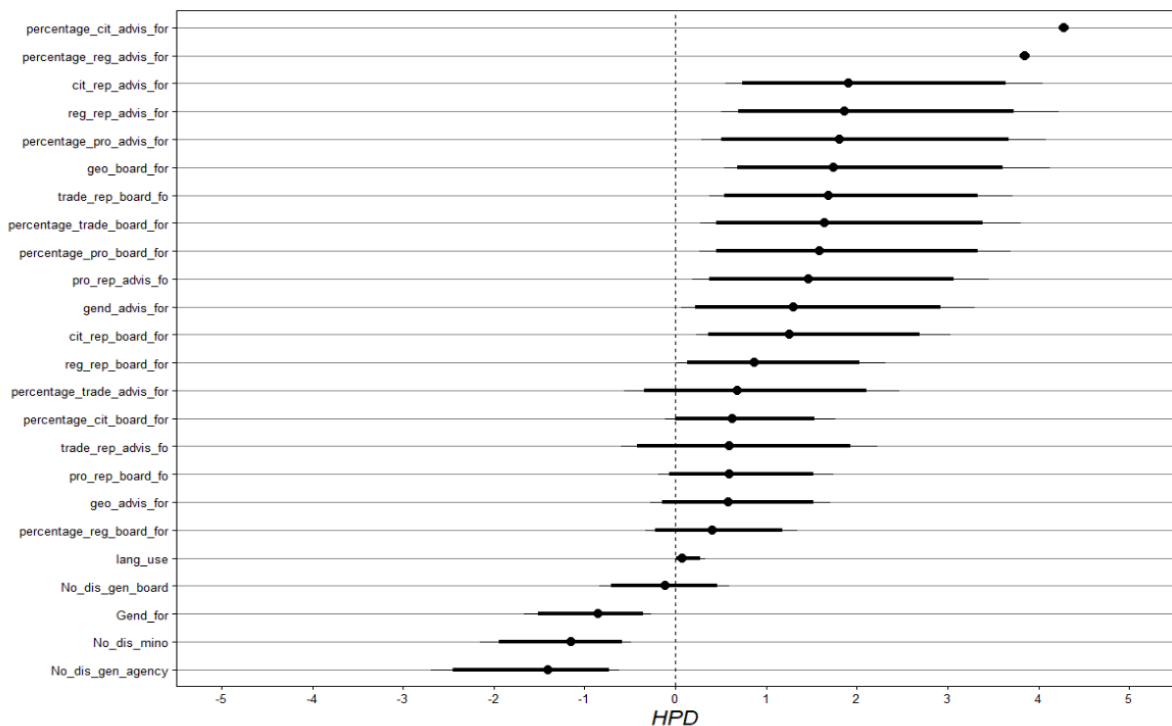
# Chain
FI.mcmc <- MCMCmixfactanal(~ lang_use+
                          Gend_for+
                          No_dis_gen_agency+
                          No_dis_minor+
                          geo_board_for+
                          No_dis_gen_board+
                          cit_rep_board_for+
                          reg_rep_board_for+

```

```

percentage_cit_board_for+
percentage_reg_board_for+
  pro_rep_board_fo+
  trade_rep_board_fo+
percentage_pro_board_for+
percentage_trade_board_for+
  gend_advis_for+
  geo_advis_for+
  cit_rep_advis_for+
  reg_rep_advis_for+
percentage_cit_advis_for+
percentage_reg_advis_for+
  pro_rep_advis_fo+
  trade_rep_advis_fo+
percentage_pro_advis_for+
percentage_trade_advis_for,
lambda.constraints =
  list(lang_use =
    list(2,"+")), # Constrain  $\lambda_2$  for
'lang_use' to be positive
  seed = 1090,
  factors = 1,
  data= FISubset,
  burnin = 10000,
  mcmc = 1000000,
  thin=100,
  verbose = 10000,
  L0 = 0.25,
store.lambda = TRUE,
store.scores = TRUE,
  tune = .25,
  10.prior = 10.prior
)

```



When we ran the model only with the items that received a positive lambda2, then all items turned negative. We then ran the original model testing for 2 factors which yielded the following:

```

                                # Priors
10.prior <- c(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
                                0,0,0,
                                     0,
                                     0.5,
                                     0.5,
                                     0,
                                     0,
                                     0.5,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     0,
                                     1,
                                     0,
                                     0,
                                     1,
                                     1
                                )
                                dim(10.prior) <- c(22,2)

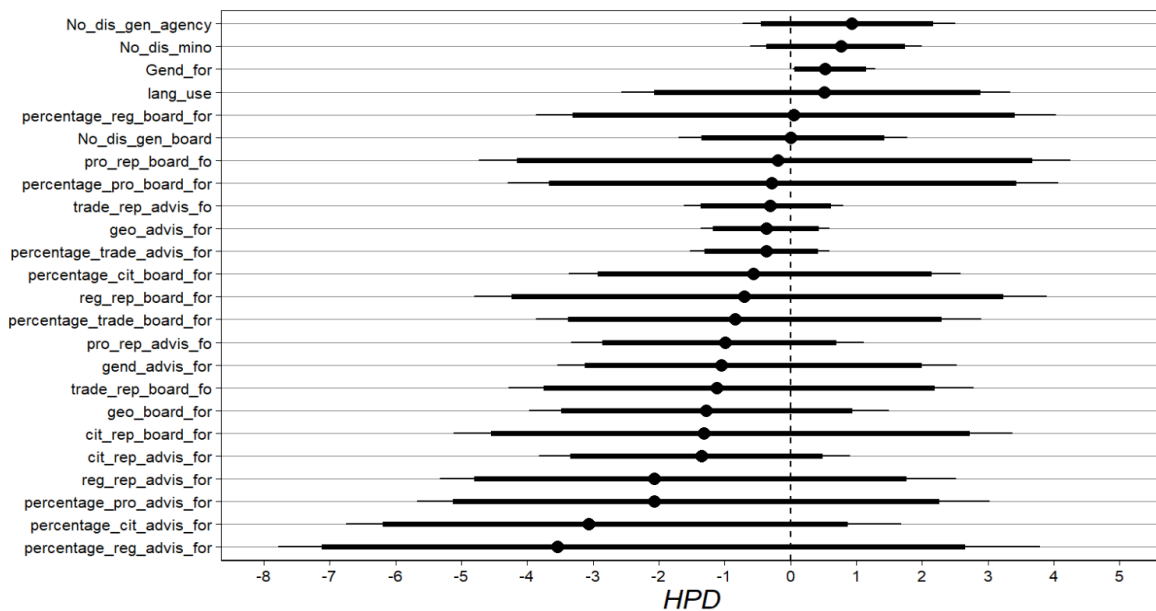
                                # Chain
                                FI.mcmc <- MCMCmixfactanal(~ lang_use+
                                                            Gend_for+
                                                            No_dis_gen_agency+
                                                            No_dis_minor+
                                                            geo_board_for+
                                                            No_dis_gen_board+
                                                            cit_rep_board_for+
                                                            reg_rep_board_for+
                                                            percentage_cit_board_for+
                                                            percentage_reg_board_for+
                                                            pro_rep_board_for+
                                                            trade_rep_board_for+
                                                            percentage_pro_board_for+
                                                            percentage_trade_board_for+
                                                            gend_advis_for+
                                                            geo_advis_for+
                                                            cit_rep_advis_for+
                                                            reg_rep_advis_for+
                                                            percentage_cit_advis_for+
                                                            percentage_reg_advis_for+
                                                            pro_rep_advis_for+
                                                            trade_rep_advis_for+
                                                            percentage_pro_advis_for+
                                                            percentage_trade_advis_for,
                                                            lambda.constraints =
                                                            list(Gend_for =
                                                                  list(2,"+"),
                                                            percentage_trade_advis_for =list(1,0),
                                                            percentage_pro_advis_for =list(1,0),
                                                            percentage_reg_advis_for =list(1,0),
                                                            percentage_cit_advis_for =list(1,0),

```

```

percentage_trade_board_for =list(1,0),
percentage_pro_board_for =list(1,0),
percentage_reg_board_for=list(1,0),
percentage_cit_board_for=list(1,0)), #
Constrain  $\lambda_2$  for 'lang_use' to be positive
  seed = 1090,
  factors = 2,
  data= FIsubset,
  burnin = 10000,
  mcmc = 1000000,
  thin=100,
  verbose = 10000,
  L0 = 0.25,
  store.lambda = TRUE,
  store.scores = TRUE,
  tune = .25,
  10.prior = 10.prior
)

```



L. Formal inclusiveness revised model

```

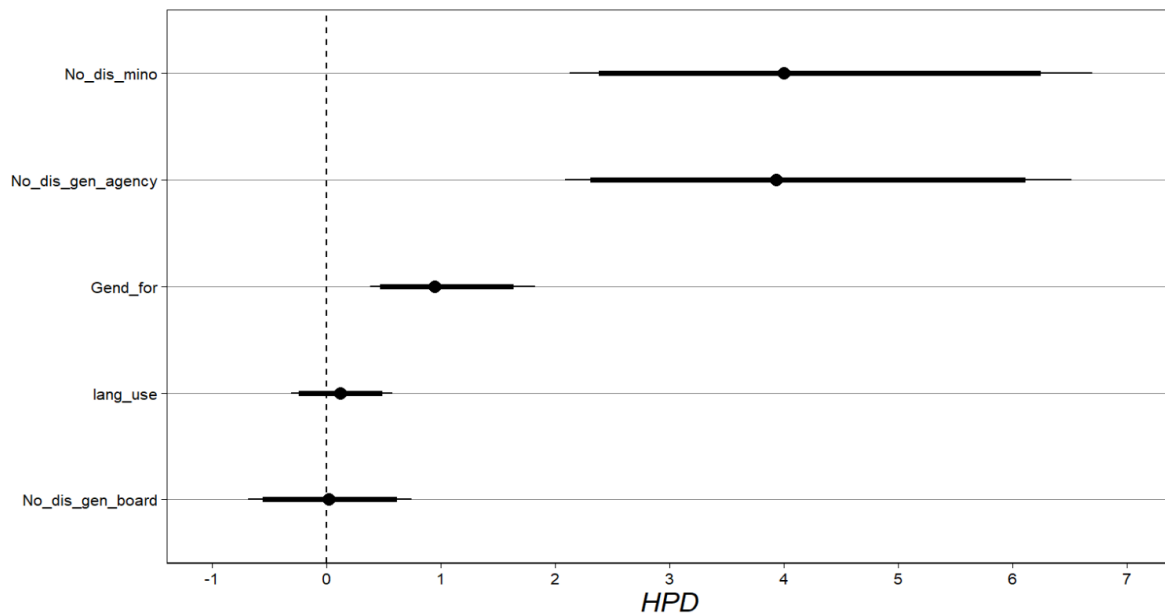
10.prior <- c(0, 0, 0, 0, 0,
             0,
             0.5,
             0.5,
             0,
             0.5
             )
dim(10.prior) <- c(5,2)

# Chain

FI.mcmc <- MCMCordfactanal(~ lang_use+
                           Gend_for+
                           No_dis_gen_agency+
                           No_dis_mino+
                           No_dis_gen_board,
                           lambda.constraints =
                           list(Gend_for =

```

```
list(2,"+")), # Constrain  $\lambda_2$  for  
'lang_use' to be positive  
  seed = 1090,  
  factors = 1,  
  data= FISubset,  
  burnin = 10000,  
  mcmc = 1000000,  
  thin=100,  
  verbose = 10000,  
  L0 = 0.25,  
  store.lambda = TRUE,  
  store.scores = TRUE,  
  tune = .25,  
  10.prior = 10.prior  
  )
```



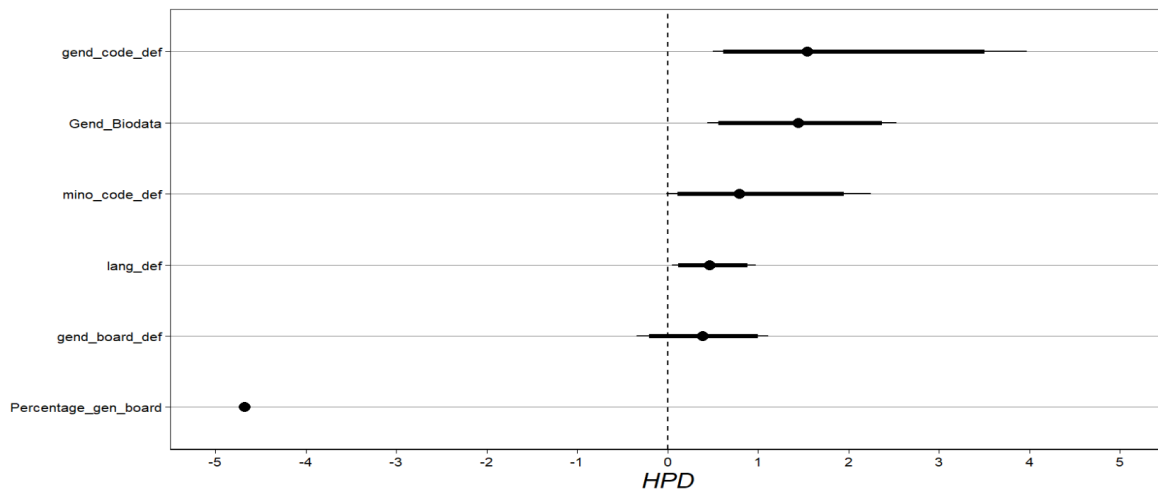
M. Inclusiveness in practice full model

```

# Priors
10.prior <- c(0, 0, 0, 0, 0, 0,
             2.5,
             0.4,
             0.485,
             0.5,
             0,
             0.287
             )
dim(10.prior) <- c(6,2)

# Chain
IP.mcmc <- MCMCmixfactanal(~ lang_def+
                          Percentage_gen_board+
                          gend_board_def+
                          gend_code_def+
                          mino_code_def+
                          Gend_Biodata,
                          lambda.constraints =
                            list(Gend_Biodata =
                                  list(2,"+")), # Constrain λ2 for
'Gend_Biodata' to be positive
                          seed = 1090,
                          factors = 1,
                          data= IPsubset,
                          burnin = 10000,
                          mcmc = 1000000,
                          thin=100,
                          verbose = 10000,
                          L0 = 0.25,
                          store.lambda = TRUE,
                          store.scores = TRUE,
                          tune = .25,
                          10.prior = 10.prior
                          )

```

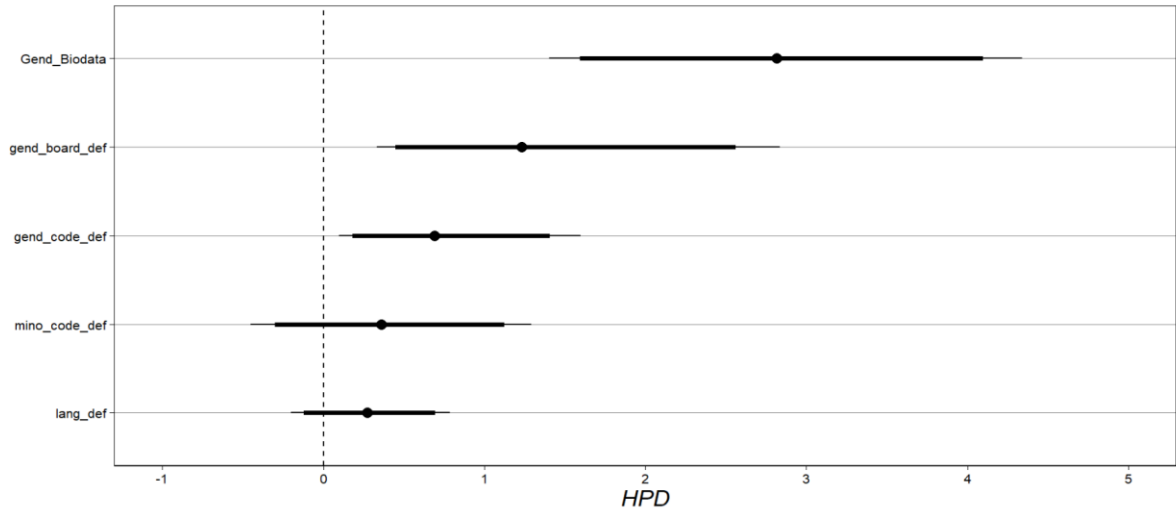
N. Inclusiveness in practice revised model

```

# Priors
l0.prior <- c(0, 0, 0, 0, 0,
             2.5,
             0.485,
             0.5,
             0,
             0.287
            )
dim(l0.prior) <- c(5,2)

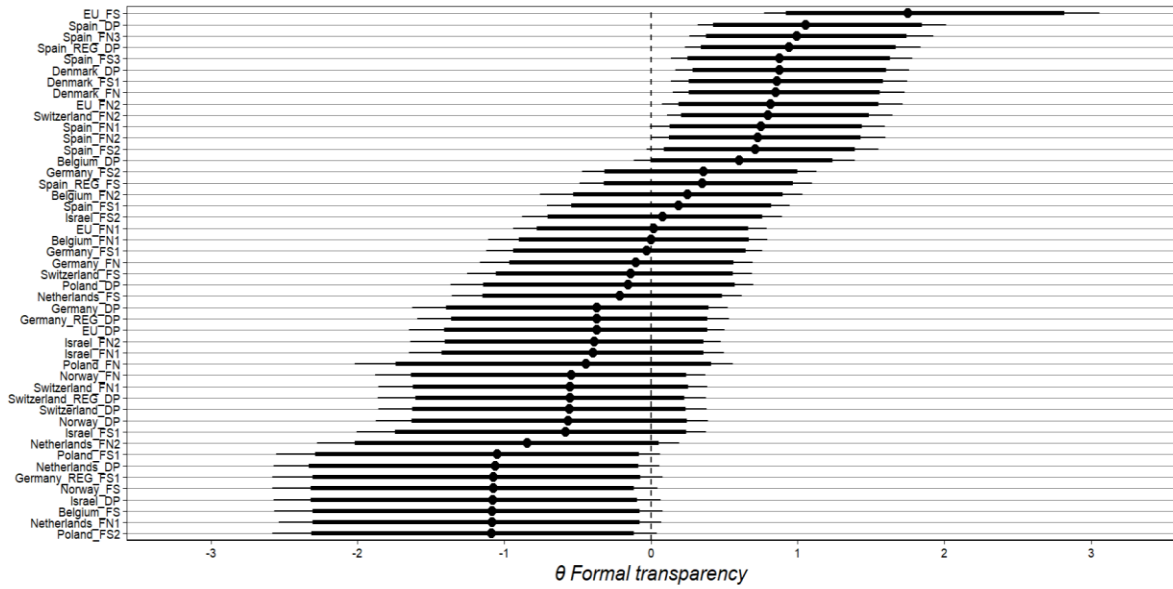
# Chain
IP.mcmc <- MCMCmixfactanal(~ lang_def+
                          gend_board_def+
                          gend_code_def+
                          mino_code_def+
                          Gend_Biodata,
                          lambda.constraints =
                            list(Gend_Biodata =
                                  list(2,"+")), # Constrain λ2 for
'Gend_Biodata' to be positive
                          seed = 1090,
                          factors = 1,
                          data= IPsubset,
                          burnin = 10000,
                          mcmc = 1000000,
                          thin=100,
                          verbose = 10000,
                          L0 = 0.25,
                          store.lambda = TRUE,
                          store.scores = TRUE,
                          tune = .25,
                          l0.prior = l0.prior
                          )

```

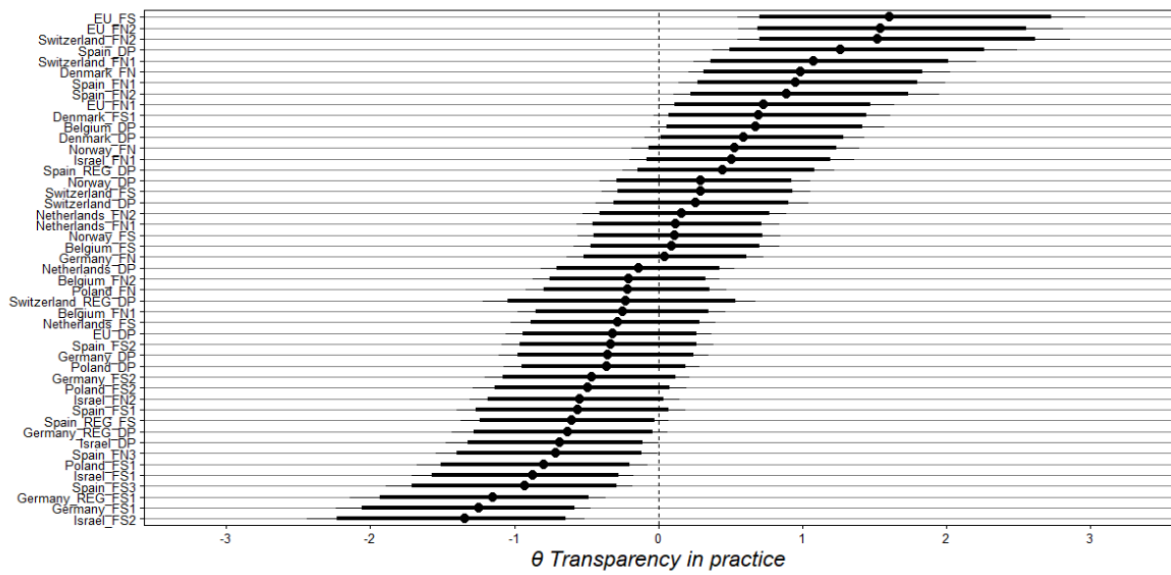


X. APPENDIX 4: AGENCIES RANKED ACCORDING TO THEIR DEMOCRATIC QUALITY

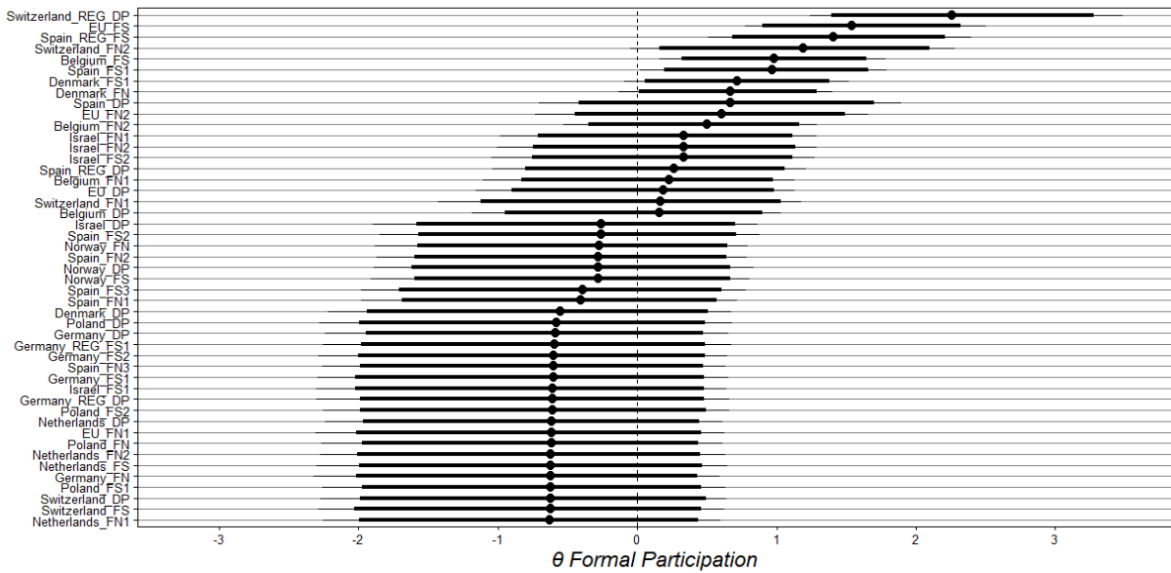
A. Formal transparency



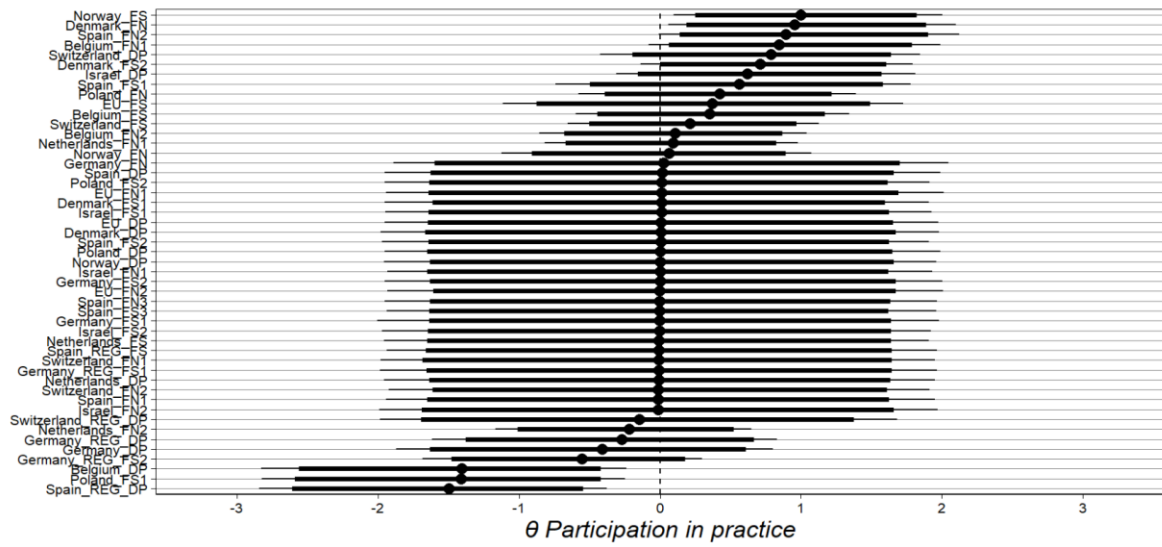
B. Transparency in practice



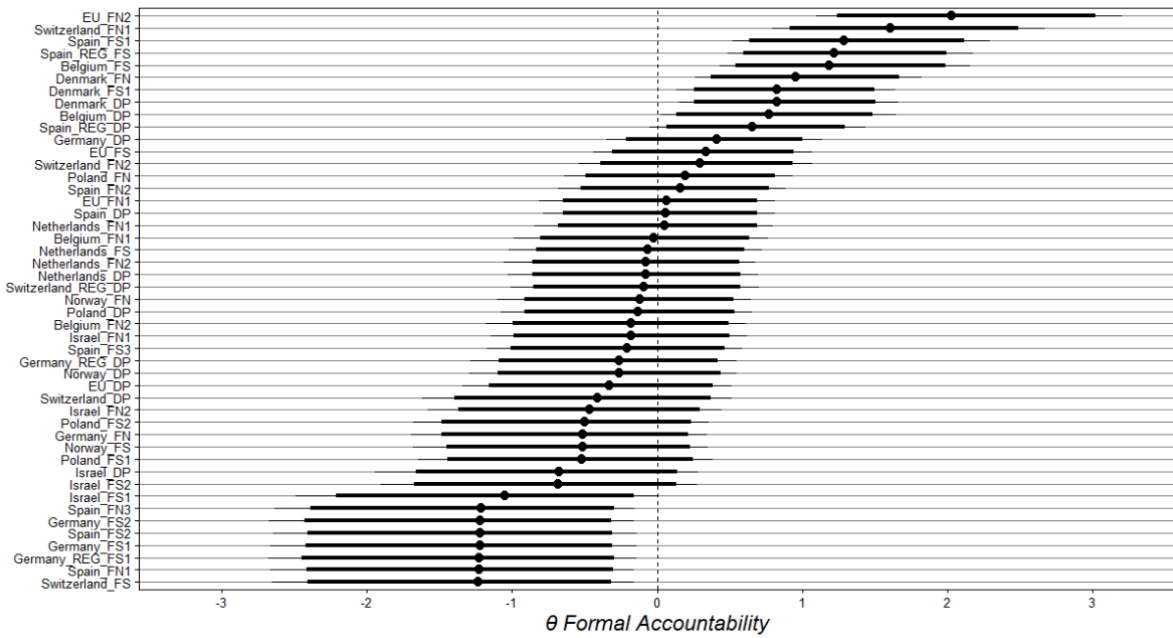
C. Formal participation



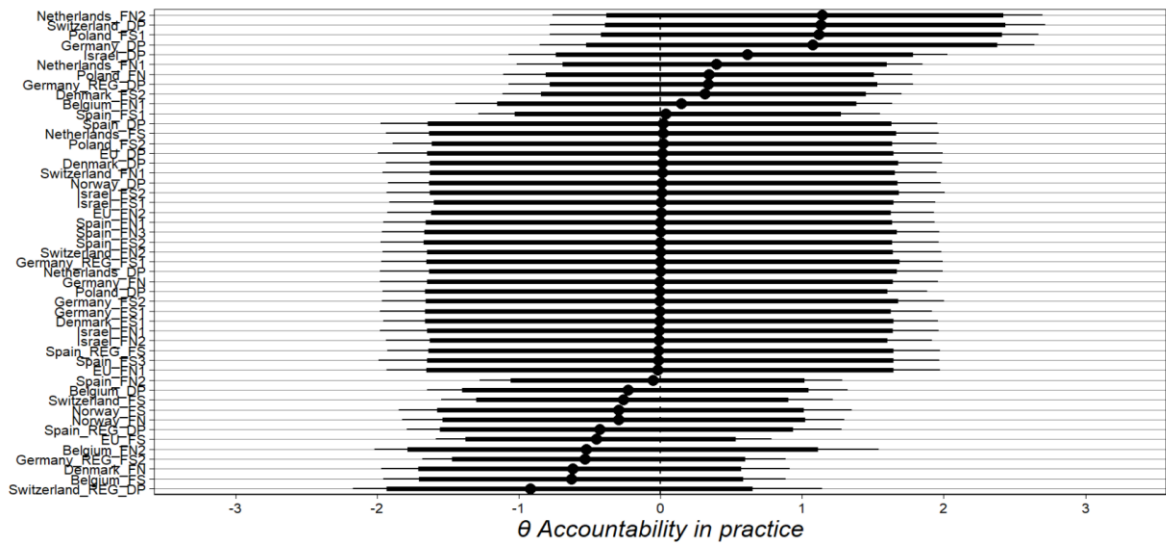
D. Participation in practice



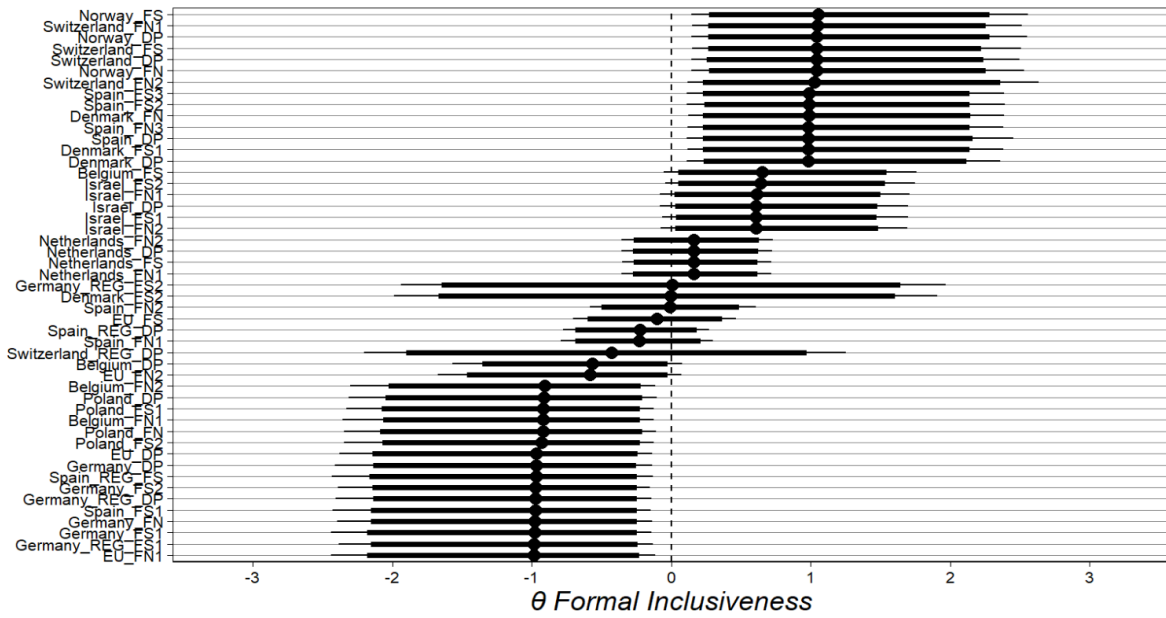
E. Formal accountability



F. Accountability in practice



G. Formal inclusiveness



H. Inclusiveness in practice

