Supplemental online material for "Studying Policy Design Quality in Comparative Perspective"

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Abstract

Technical documentation of the article "Studying Policy Design Quality in Comparative Perspective" published at *American Political Science Review*.

Contents

1 Coding manual (excerpt)

1.1 Basic Coding Procedure and Main Concepts

At the most basic level, the coders have to identify single events of policy change in the collected legal documents and, for each single event, assess the direction of change, i.e., whether the event of policy change represents the introduction or abolishment of a given target-instrument-combination.

To come into consideration, a policy change has to meet the following requirements in form and content. Formally, a relevant policy change is any measure or provision in the collected legislation (and where necessary respective administrative circulars specifying these rules) that

- was published during the observation period, which starts on **January 1, 1975**, and ends on **December 31, 2005**
- was adopted at the **national level**

The second point clearly excludes measures by sub-national jurisdictions such as regional or local bodies, even if the latter are state-like entities with far-reaching competencies as in federal states.

1.2 Coding Categories

The method used to assess and code policy change, is intended to be universally applicable, i.e. over a wide range of countries, irrespective of differing legal and administrative traditions. Thus, the coding rules comprise two invariant general categories. These are policy targets and policy instruments.

By means of these two categories, we seek to measure developments over time in a nuanced manner. Moreover, in order to assess whether a change represents the introduction or abolishment, we are interested in policy change relative to the previous state. Thus, as will be explained in more detail in this section, relative changes to the previous targets and instruments need to be coded. We are interested in the introduction and abolishment of (new) policy target (guiding question: *what is adressed?*), of policy instruments (*how is something addressed?*).

Recalling the observation period (January 1, 1975 to December 31, 2005), this stated focus on change has one important implication: Although the relevant information for deciding whether a legal act falls into the observation period is the date of publication, it might be the case that coders need to consult legislation originating from some year before 1980 in order to reconstruct the occurrence and the direction of change. For instance, if a law adopted in 2008 changes a law enacted in 1973, the latter legislation has to be considered in order to make a statement about the direction and nature of change taking place through the 2008 legislation.

1.3 Coding Category 1: Policy Targets

The first and most general coding category is policy targets. For analytical reasons, we use a very narrow conception of policy targets. By policy targets, we mean a very specific activity within a subarea of a policy field guided by the question: who or what is addressed? More specifically, a policy target is subject to state activities in order to achieve a political objective within a specific area. The tables below contain the policy targets this project is exclusively interested in. Thus, when screening the legislative acts, please identify the presence and/or abolishment of any policy targets from these lists and indicate these events of policy change as either introduction or termination.

One single target has to be coded only once per legislative act – it must not be coded multiple times. Any instrument concerning this specific target will be attributed to the one single target. If a policy target from the list is introduced for the first time, i.e. subject to governmental action for the first time, this particular event must be coded as policy introduction. If, by contrast, a policy target from the list is abolished, i.e. is not subject to governmental action anymore, this particular event must be coded as policy termination. Please note that the termination of a target entails the termination of all attached instruments, which have to be coded separately. The same is true when a target is addressed for the first time.

A table with the instruments can be obtained from the R' `PolicyPortfolios` package:

```
library(PolicyPortfolios)
data(consensus.targets)
consensus.targets
```

	Clean Air Policy
1.	Air quality standards for nitrogen oxides (NOx)
2.	Air quality standards for sulphur dioxide (SO_2)
3.	Air quality standard for carbon monoxide (CO)
4.	Air quality standard for particulate matter
5.	Air quality standard for ozone (O_3)
6.	Air quality standard for lead
7.	Nitrogen oxide (NOx) emissions from large combustion plants using coal
8.	Nitrogen oxide (NOx) emissions from passenger vehicles using unleaded gasoline
9.	Nitrogen oxide (NOx) emissions from heavy duty vehicles using diesel
10.	Sulphur dioxide (SO_2) emissions from large combustion plants using coal
11.	Sulphur dioxide (SO_2) emissions from passenger vehicles using unleaded gasoline
12.	Sulphur dioxide (SO_2) emissions from heavy duty vehicles using diesel
13.	Carbon dioxide (CO_2) emissions from large combustion plants using coal
14.	Carbon dioxide (CO_2) emissions from passenger vehicles using unleaded gasoline
15.	Carbon monoxide (CO) emissions from large combustion using coal
16.	Carbon monoxide (CO) emissions from passenger vehicles using unleaded gasoline

17. Particulate matter emissions from large combustion plants using coal
18. Arsenic emissions from stationary sources
19. Maximum permissible limit for the lead content of gasoline
20. Maximum permissible limit for the sulphur content of diesel

Water Protection Policy

1. Lead in continental surfaces water (i.e. waters that flow or which are stored on the surface, and include natural water channels like rivers, surface runoff, streams, lakes and others)
2. Copper in continental surfaces water
3. Nitrate (NO_3^-) in continental surfaces water
4. Phosphates in continental surfaces water
5. Zinc in continental surfaces water
6. Oils in continental surfaces water
7. Pesticides (fungicides, herbicides, insecticides, exempt DDT) in continental surfaces water
8. DDT (Dichloro-Diphenyl-Trichloroethane) in continental surfaces water
9. Phenols (as total C) in continental surfaces water
10. BOD (Biochemical Oxygen Demand) of continental surfaces water
11. Lead from industrial discharges into continental surfaces water
12. Copper from industrial discharges into continental surfaces water
13. Nitrate (NO_3^-) from industrial discharges into continental surfaces water
14. Phosphates from industrial discharges into continental surfaces water
15. Chloride (Cl^-) from industrial discharges into continental surfaces water
16. Sulphates from industrial discharges into continental surfaces water
17. Iron from industrial discharges into continental surfaces water
18. Zinc from industrial discharges into continental surfaces water
19. Oils and greases from industrial discharges into continental surfaces water
20. Pesticides and herbicides from industrial discharges into continental surfaces water
21. Phenols (as total C) from industrial discharges into continental surfaces water
22. Coliform bacteria from industrial discharges into continental surfaces water
23. BOD (Biochemical Oxygen Demand) from industrial discharges into continental surfaces water

24. COD (Chemical Oxygen Demand) from industrial discharges into continental surfaces water

	Conservation Policy
1.	Native Forests
2.	Nature protection areas and reserves
3.	Import and export of endangered species
4.	Import and export of endangered plants

1.4 Coding Category 2: Policy instruments

We define a policy instrument as a tool or means adopted to achieve the underlying political objective of the selected environmental policy target. A policy instrument thus describes the type of governmental action adopted for a given policy target. A policy instrument is intended to have a regulating and/or guiding effect on people's actions. The tables below contain all potential policy instruments for environmental policy. For each policy targets, if addressed, there is at least one policy instrument defined as a tool to achieve the underlying political objective. Yet, any policy target may be addressed by means of various policy instruments. For each addressed policy target, the coders are asked to identify all instruments. Please note that a given policy instrument belongs to one type/group only. The following table is exhaustive, containing the most common environmental policy instruments.

A table with the instruments can be obtained from the R' `PolicyPortfolios` package:

```
library(PolicyPortfolios}
data(consensus.instruments}
consensus.instruments
```

Instrument	Description	Example
Obligatory standards	A legally enforceable numerical standard, typically involving a measurement unit, e.g. mg/l	Limit value for lead emissions in surface water, e.g. 50 mg/l
Prohibition / Ban	A total or partial prohibition/ban on certain emissions, activities, products etc.	Ban on importation of products containing flurochlorocarbons
Technological prescription	A measure prescribing the use of a specific technology or process	Installations have to be operated in accordance with the principle of 'best available techniques' (BAT)
Tax / Levy	A tax or levy for a polluting product or activity	Tolls and road user charges for trucks depending on the emission class

Subsidy / Tax	A measure by which the state grants a financial advantage to a certain product or activity	Tax reduction for vehicles in series production complying with a regulation
Liability scheme	A measure that allocates the costs of environmental damage to those who have caused the damage	Establishment of an emission trading system
Planning instruments	A measure defining areas or times that deserve particular protection	Action plans indicating the measures to be taken during times when there is a risk of the limit being exceeded
Public investment	A specific public investment	Programs given financial support for the retrofitting of in-use vehicles and for scrapping old vehicles
Data collection / Monitoring	A specific programme for collecting data	Establishment of measuring stations designed to supply the data necessary for the application of a certain regulation
Voluntary instruments	Voluntary agreements or commitments between the state and private actors or by private actors alone	Manufacturers can apply for the CO_2 savings achieved as a result of eco-innovation (if approved can used to contribute to manufacturer's specific emissions target)
Information-based instruments	Information provided by the state or the polluters indicating the environmental externalities of a certain product or activity	Label on fuel economy and CO_2 emissions of a vehicle displayed at the point of sale.
Other	Any instrument that cannot be assigned to the other categories	(…)

2 Diversity

2.1 On how to calculate Average Instrument Diversity

Let M be a policy portfolio defined by T policy targets and I instruments, where each space in $M = T * I$ can either be occupied by a policy (1) or not covered by any policy (0).

In the example in the article (Figure 2 in the article and Figure 1 here), the portfolios for France and the US are compared. France is reported to have an AID=0.464 in 1976. The algorithm to arrive at such value is the following:

- The portfolio for France in 1976 contains 8 spaces filled in, with 8 policy targets covered and and 3 instruments.
- For each of the 8 policy spaces covered, perform the following operations:
- Excluding the current policy target, how many other instruments are being used?. For instance, in the case of Target=10/Instrument=7, there are two other instruments used.
- Calculate the probability that those two other policy spaces covered by a different instrument represent over the total of possible spaces excluding the space being examined. In this case 2 / 7 = 0.286.
- Take the average for all remaining combinations. In the case of instruments 10 and 11, the probability that the other spaces are covered by a different instrument is 1. Hence, the values are 0.286 six times and 1 two times, with an average of 0.464.

The function is implemented in the `R` package `PolicyPortfolios` Fernández-i-Marín 2020, as `diversity_aid()`.

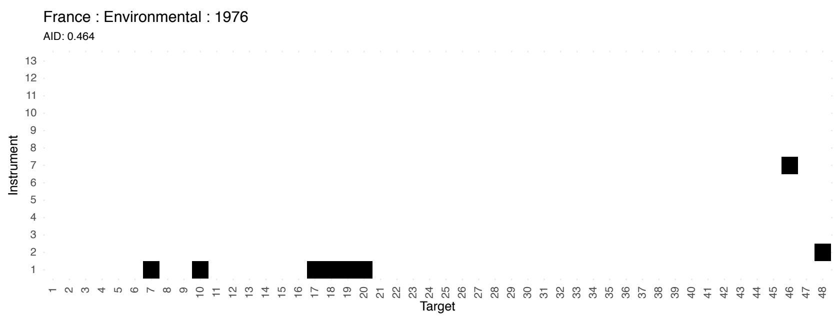

Figure 1: France, 1976. Environmental policy portfolio.

2.2 Description of Average Instrument Diversity

Figure 2 shows the time series of the main outcome of interest: Average Instrument Diversity (AID).

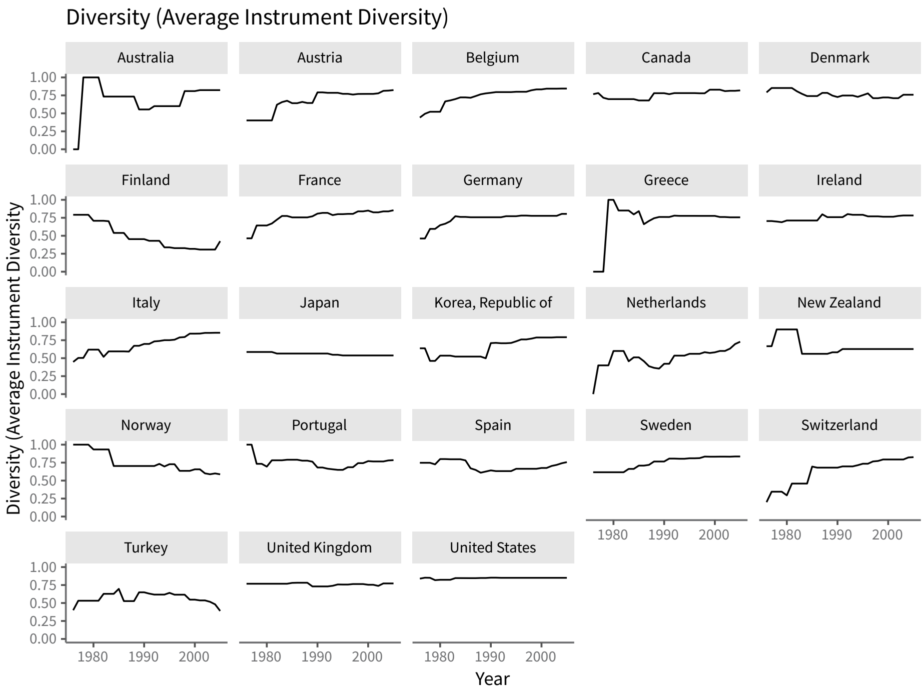

Figure 2: Temporal evolution of Average instrument diversity.

2.3 On the comparison between AID and other measures of diversity

Let M be a portfolio with $T = 9$ policy targets and $I = 4$ policy instruments. The number of all potential combinations of policy portfolios with a $9 * 4$ design is 8192. From all these possible combinations of portfolios, Figure 3 shows the comparison between the proposed Average Instrument Diversity and other measures:

Diversity (Gini-Simpson) Original Gini-Simpson measure of diversity.

Equality of instrument configurations Equality measure (reverse of Gini index) of the number of different instrument configurations in the portfolio.

Equitability (Shannon) Shannon's measure of equitability.

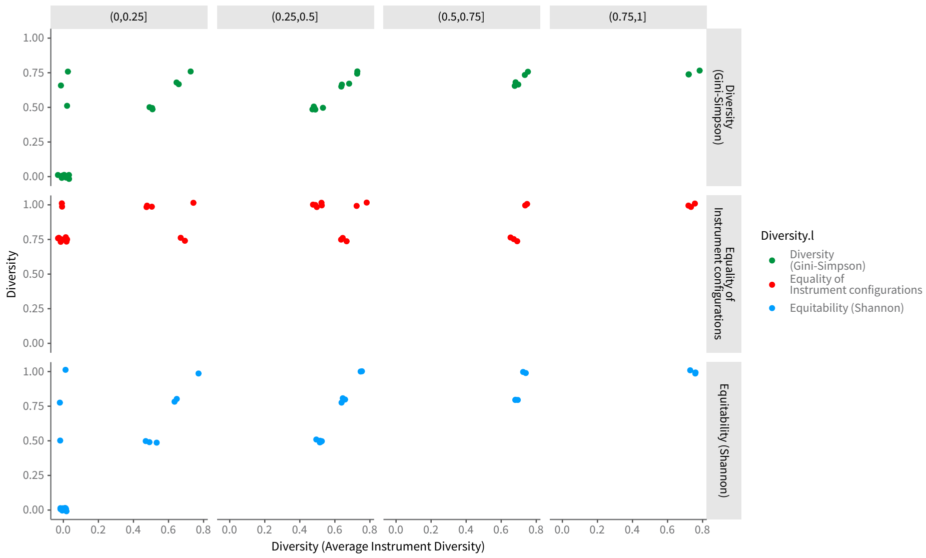

Figure 3: Average instrument Diversity against other measures of portfolio diversity, at different levels of portfolio size, for all possible combinations in a simulated policy space of 9 targets and 4 instruments.

Another way to compare the proposed AID measure and others is by looking at the cases analyzed in the paper. Figure 4 shows the values of AID vs Gini-Simpson for all environmental portfolios in the countries under analysis through all years.

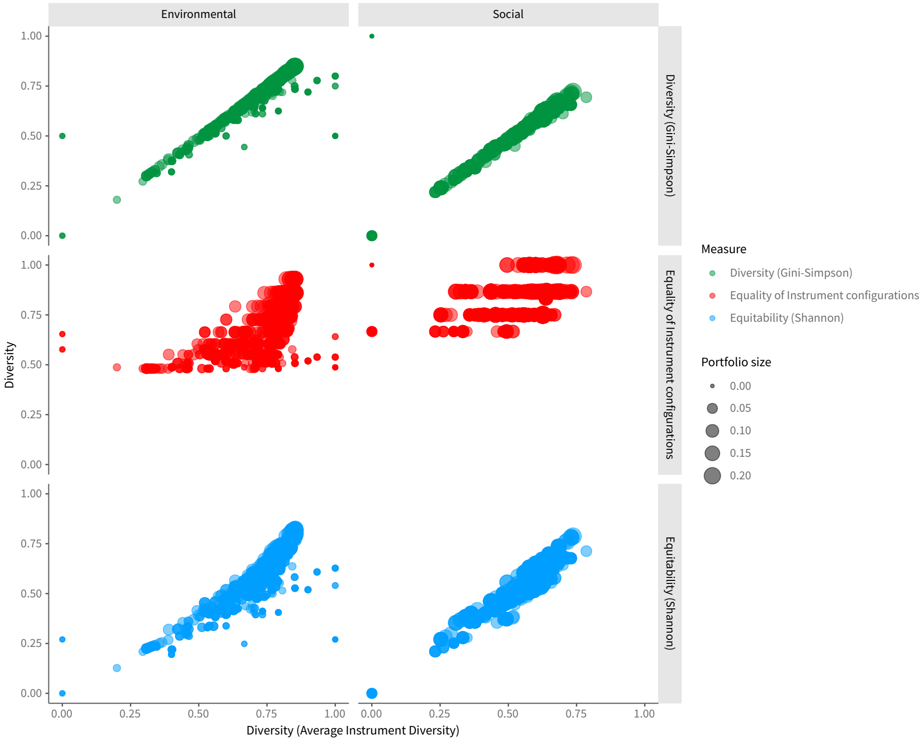

Figure 4: Average Instrument Diversity against Gini-Simpson Diversity, for the observations under analysis.

3 Results

This section contains the results of the main model in the article, but focuses on parameters that are not of main interest.

3.1 Variances

The model controls for heteroskedasticity in the portfolio size (differential variance on diversity at different stages of portfolio size), represented in Figure 5 and also clusters the errors by country, represented in Figure 6). Substantially, the results shown in Figure 5 indicate that the higher the portfolio size, the lower the variation on diversity, or the more certain we are about its value.

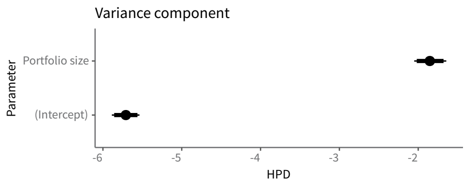

Figure 5: Parameters (λ) accounting for the effects on the variance of diversity (heteroskedasticity).

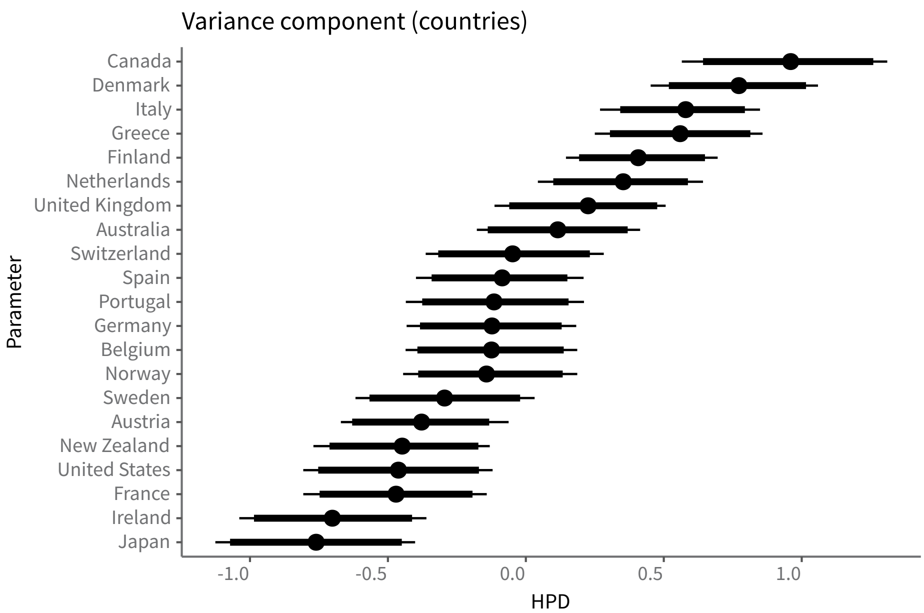

Figure 6: Parameters accounting for errors clustered by countries (γ_c).

3.2 Auto-regressive components

Figure 7 presents the ρ parameters that govern the auto-regressive (AR1) temporal dynamic in the model.

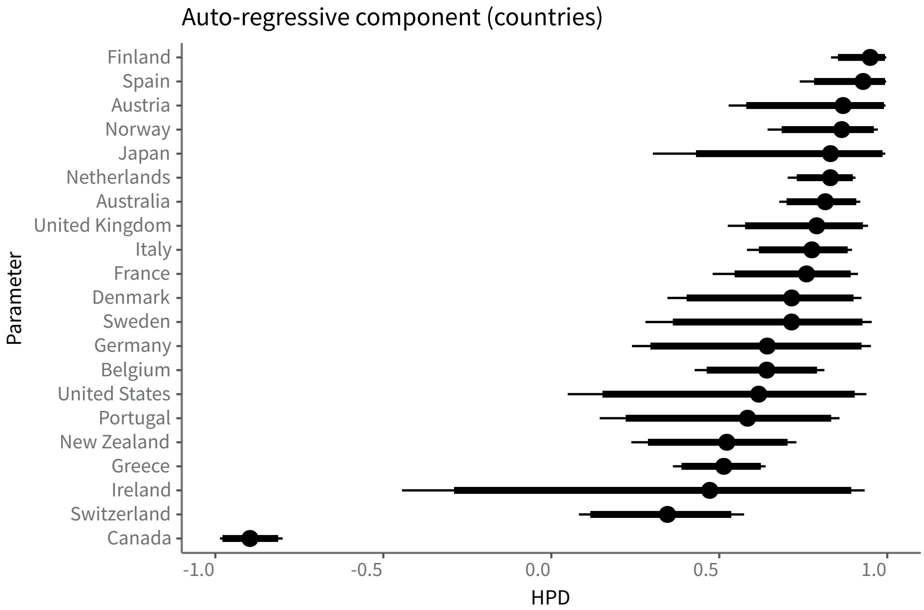

Figure 7: Auto-regressive (AR1) parameters (ρ_c).

4 Determinants of Environmental Performance

4.1 Interaction model

Figure 8 shows the determinants of Environmental Performance in in 21 OECD countries (1976–2005) with Interaction Effect.

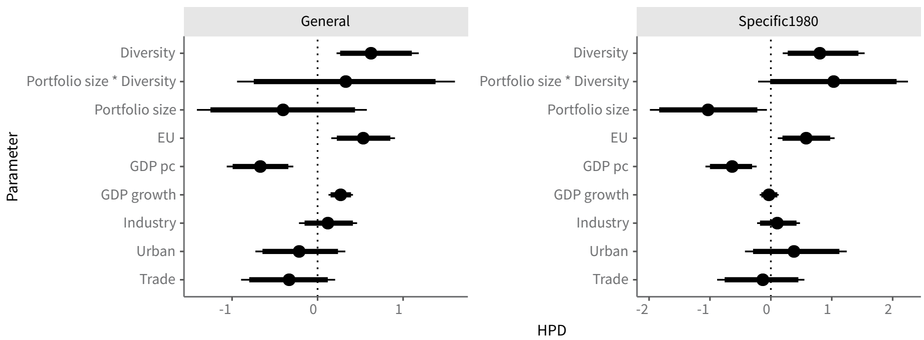

Figure 8: Highest posterior densities (HPD) of the parameters that control the time series variation (95% credible interval).

4.2 Structural Equation Model

This section describes the instrumental variable approach employed, using structural equation modelling. Figure 10 shows the determinants of general Environmental Performance. The model accounts for direct effects of general institutional variables on environmental performance, as well as indirect effects through the residuals on diversity. Environmental performance is explained by portfolio diversity directly, as well as by its own control variables. Also, the unexplained component of portfolio diversity that remains after having explained it by political constraints, portfolio size and a set of control variables, is added into the possible explanatory variables for performance. Therefore, we can get the direct effect of environmental portfolio diversity on environmental performance, ensuring that such direct effect controls for other variables that can themselves affect diversity.

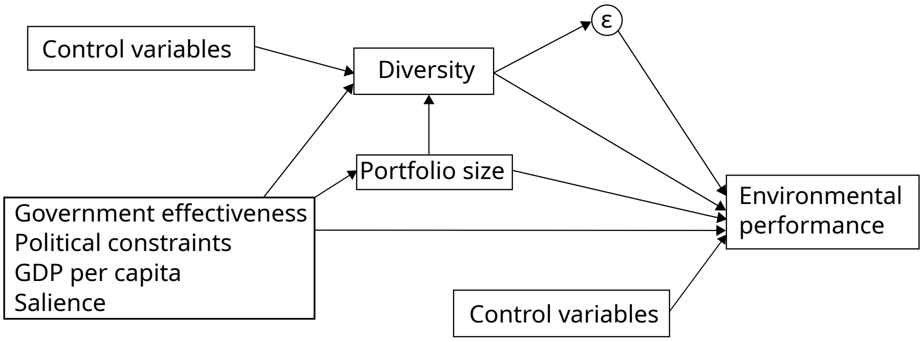

Figure 9: Determinants of Environmental performance.

Figure 10 shows the determinants of general Environmental Performance in in 21 OECD countries (1976–2005) using the structural equation model presented in Section 4.2.

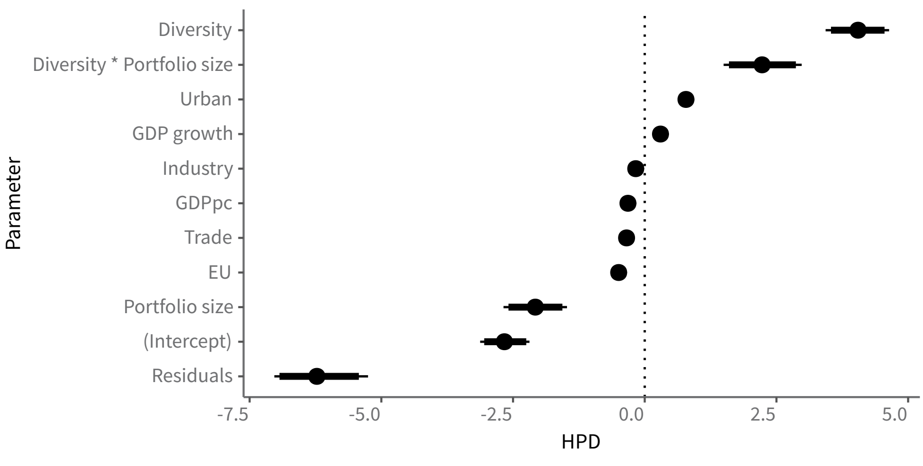

Figure 10: Direct effects on Environmental performance.

5 Mediated effects

Figure 11 shows the mediated effects on average instrument diversity (AID) in 21 OECD countries (1976–2005) through Portfolio Size. This correspond to the effects that, in Figure 9 go from government effectiveness, political constraints and GDP per capita to diversity *through* portfolio size.

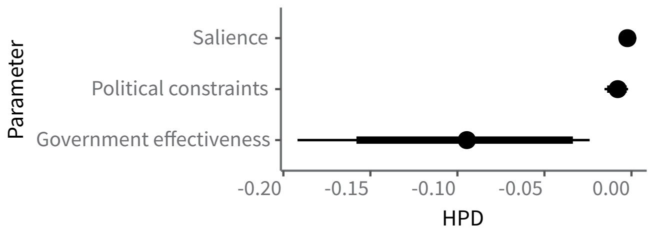

Figure 11: Highest posterior densities (HPD) of the mediated effects (95% credible interval).

6 Robustness

6.1 Model specification

Figure 12 shows the same parameters of the main model presented in the article (with government effectiveness) compared to using instead "Policy feedback", a dimension of vertical policy integration.

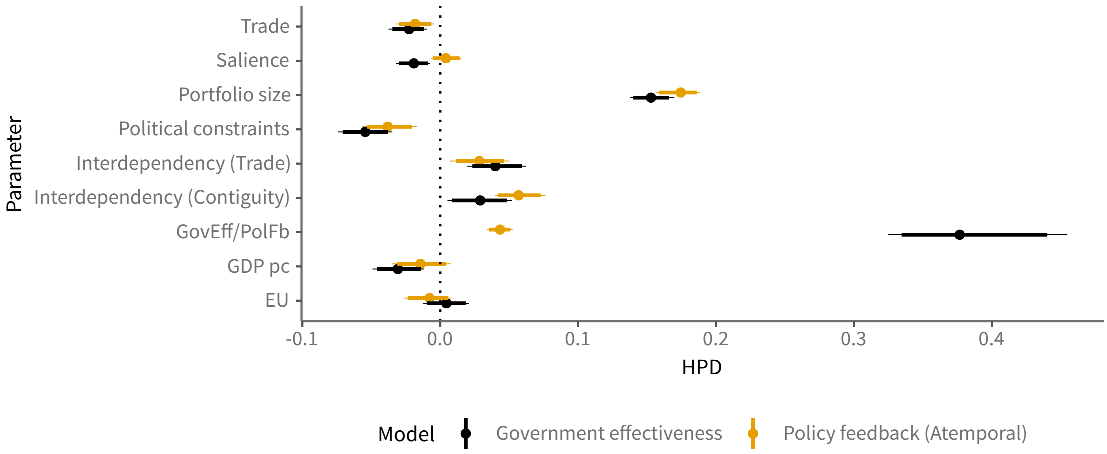

Figure 12: Comparison of the results on diversity, using Policy feedback or Government effectiveness.

6.2 Market-based instruments

Here, we replicate our analysis adding a new instrument type called 'market-based instruments'. It comprises the EU Emission Trading Programme for the EU member states for the year 2005 and the acid rain program in the US for the years 1995 onwards. Before, these policies were consistently coded as "liability schemes" given that the polluters had to offset the damage their created.

Figure 13 shows the same parameters of the main model presented in the article, compared to the a dataset with a new market-based instrument.

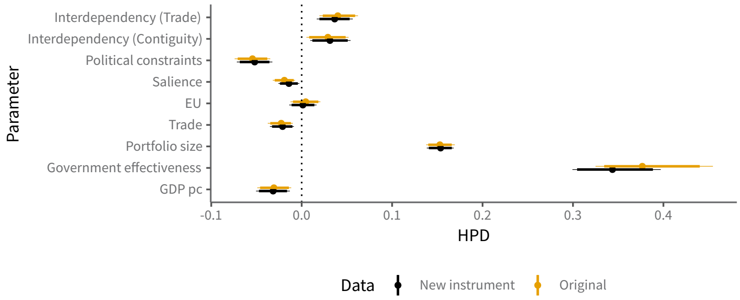

Figure 13: Comparison of the results on diversity, using the main dataset or one that contains a new market-based instrument.

6.3 Democracy

Here, we replicate our analysis adding a new control variable (”Democracy”) using the average of the 5 dimensions of the V-Dem democracy index.

Figure 14 shows the same parameters of the main model presented in the article, compared to the model with one more variable (Democracy).

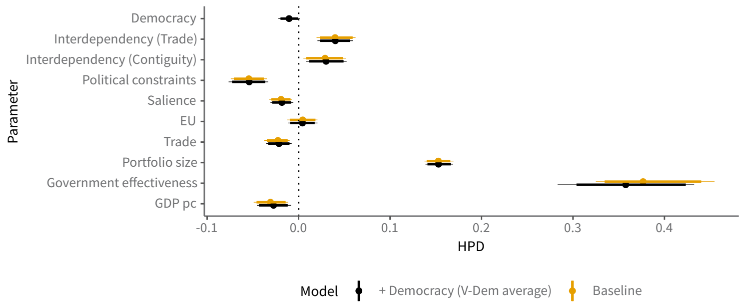

Figure 14: Comparison of the results on diversity, using the main model presented in the article and the one with a new control variable (Democracy).

7 Average Instrument Diversity in Social Policy

Figure 15 shows the same parameters of the main model presented in the article (with the Environmental sector) compared to the Social sector.

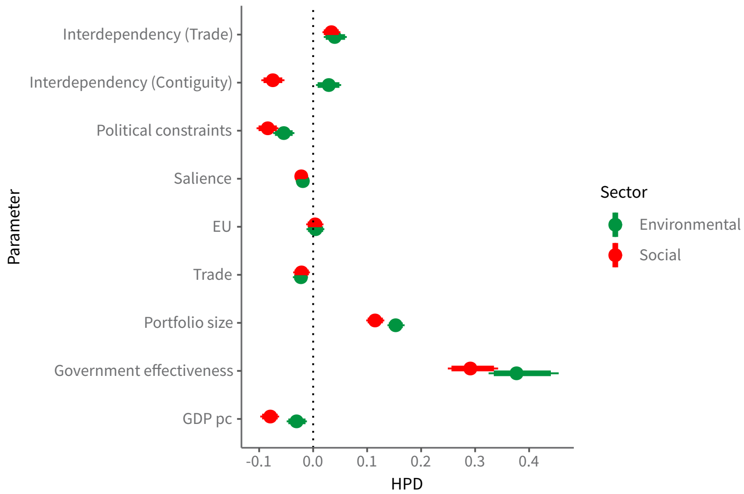

Figure 15: Comparison of the results on diversity, using an Environmental or a Social policy portfolio.

8 Code

The JAGS code for the model is the following.

```
model {
  #
  # Data part at the observational level
  #
  for (d in 1:nD) { # Different specifications of diversity
    for (s in 1:nS) { # Sectors
      for (c in 1:nC) { # Countries
        for (t in 2:nY) { # Time, years
          Y[s,c,t,d] ~ dnorm(mu[s,c,t,d], tau[s,c,t,d])
          mu[s,c,t,d] <- alpha[s,d,id.decade[t]]
                   + beta[1,s,d] * GDPpc[c,t-1]
                   + beta[2,s,d] * gov.eff[s,c,t-1]
                   + beta[3,s,d] * portfolio.size[s,c,t-1]
                   + beta[4,s,d] * trade[c,t-1]
                   + beta[5,s,d] * eu[c,t-1]
                   + beta[6,s,d] * green.socialist[s,c,t-1] # col 1 green, col 2 socialist
                   + beta[7,s,d] * constraints[c,t-1]
                   + beta[8,s,d] * interdependency.contiguity[d,s,c,t]
                   + beta[9,s,d] * interdependency.trade[d,s,c,t]
                   + rho[s,c,d] * (Y[s,c,t-1,d] - mu[s,c,t-1,d] )
          tau[s,c,t,d] <- 1 / sigma.sq[s,c,t,d]
          sigma.sq[s,c,t,d] <- exp(lambda[1,s,d]
                                + lambda[2,s,d] * portfolio.size[s,c,t]
                                + lambda_c[c,d])
          resid[s,c,t,d] <- Y[s,c,t,d] - mu[s,c,t,d]
        }
        Y[s,c,1,d] ~ dnorm(mu[s,c,1,d], tau[s,c,1,d])
        mu[s,c,1,d] <- alpha[s,d,1]
                 + beta[1,s,d] * GDPpc[c,1]
                 + beta[2,s,d] * gov.eff[s,c,1]
                 + beta[3,s,d] * portfolio.size[s,c,1]
                 + beta[4,s,d] * trade[c,1]
                 + beta[5,s,d] * eu[c,1]
                 + beta[6,s,d] * green.socialist[s,c,1] # col 1 green, col 2 socialist
                 + beta[7,s,d] * constraints[c,1]
                 + beta[8,s,d] * interdependency.contiguity[d,s,c,1]
                 + beta[9,s,d] * interdependency.trade[d,s,c,1]

        resid[s,c,1,d] <- Y[s,c,1,d] - mu[s,c,1,d]
        tau[s,c,1,d] <- 1 / sigma.sq[s,c,1,d]
        sigma.sq[s,c,1,d] <- exp(lambda[1,s,d]
                              + lambda[2,s,d] * portfolio.size[s,c,1]
                              + lambda_c[c,d])
      }


      #
      # Degrees of freedom of GR
      #
      nu[s,d] <- 1 + (-1 * log(nu.trans[s,d]))
      nu.trans[s,d] ~ dunif(0, 1)

      #
      # Priors for variance component
      #
      lambda[1,s,d] ~ dnorm(0, 2^-2)
      lambda[2,s,d] ~ dnorm(0, 2^-2)

      #
      # Priors for the intercept
      #
      for (decade in 1:nDecades) {
        alpha[s,d,decade] ~ dnorm(Alpha[s,d], tau.alpha[s,d])
      }
      Alpha[s,d] ~ dunif(0, 1)
      tau.alpha[s,d] <- 1 / sqrt(sigma.alpha[s,d])
      sigma.alpha[s,d] ~  dunif(0, 0.5)
      #
      # Priors for the control variables
      #
      beta[1:nB,s,d] ~ dmnorm(b0, Omega[1:nB,1:nB,s,d])
      Omega[1:nB,1:nB,s,d] ~ dwish(B0, nB + 1)
      Sigma[1:nB,1:nB,s,d] <- inverse(Omega[1:nB,1:nB,s,d])
    }
    #
    # Data part for  performance
    #
```

```
    for (p in 1:nP) {
      for (c in 1:nC) {
        for (t in 2:nY) {
          Y.performance[p,c,t,d] ~ dnorm(mu.performance[p,c,t,d], tau.performance[p,d])
          mu.performance[p,c,t,d] <- eta.performance[1,p,d]
                                   + eta.performance[2,p,d] * resid[1,c,t,d]
                                   + eta.performance[3,p,d] * Y[1,c,t-1,d]
                                   + eta.performance[4,p,d] * portfolio.size[1,c,t-1]
                                   + eta.performance[5,p,d] * Y[1,c,t-1,d] * portfolio.size[1,c,t-1]
                                   + eta.performance[6,p,d] * GDPpc[c,t-1]
                                   + eta.performance[7,p,d] * trade[c,t-1]
                                   + eta.performance[8,p,d] * eu[c,t-1]
                                   + eta.performance[9,p,d] * gdp.growth[c,t-1]
                                   + eta.performance[10,p,d] * urban[c,t-1]
                                   + eta.performance[11,p,d] * industry[c,t-1]
                                   + rho.performance[p,c,d] * (Y.performance[p,c,t-1,d] * mu.performance[p,c,t-1,d])
        }
        Y.performance[p,c,1,d] ~ dnorm(mu.performance[p,c,1,d], tau.performance[p,d])
        mu.performance[p,c,1,d] <- eta.performance[1,p,d]
                                 + eta.performance[2,p,d] * resid[1,c,1,d]
                                 + eta.performance[3,p,d] * Y[1,c,1,d]
                                 + eta.performance[4,p,d] * portfolio.size[1,c,1]
                                 + eta.performance[5,p,d] * Y[1,c,1,d] * portfolio.size[1,c,1]
                                 + eta.performance[6,p,d] * GDPpc[c,1]
                                 + eta.performance[7,p,d] * trade[c,1]
                                 + eta.performance[8,p,d] * eu[c,1]
                                 + eta.performance[9,p,d] * gdp.growth[c,1]
                                 + eta.performance[10,p,d] * urban[c,1]
                                 + eta.performance[11,p,d] * industry[c,1]
      }
      tau.performance[p,d] ~ dgamma(0.001, 0.001)
      sigma.performance[p,d] <- 1 / sqrt(tau.performance[p,d])
      for (e in 1:11) {
        eta.performance[e,p,d] ~ dnorm(0, 1^-2)
      }
    }

    # Variance component, intercepts by country
    for (c in 1:nC) {
      lambda_c[c,d] ~ dnorm(0, 0.2^-2)
    }
    #
    # AR(1) parameters
    #
    for (c in id.real.countries) {
      for (s in 1:nS) {
        rho[s,c,d] ~ dunif(-1, 1)
      }
      for (p in 1:nP) {
        rho.performance[p,c,d] ~ dunif(-1, 1)
      }
    }
    for (c in id.fake.countries) {
      for (s in 1:nS) {
        rho[s,c,d] ~ dnorm(0.75, 0.2^-2)T(-1, 1)
      }
      for (p in 1:nP) {
        rho.performance[p,c,d] ~ dnorm(0.75, 0.2^-2)T(-1, 1)
      }
    }
  }

  # SEM Part for portfolio size
  for (s in 1:nS) {
    for (c in 1:nC) {
      for (t in 2:nY) {
        portfolio.size[s,c,t] ~ dnorm(mu.ps[s,c,t], tau.ps[s,c])
        mu.ps[s,c,t] <- alpha.ps[s,c]
                      + delta[1,s] * GDPpc[c,t-1]
                      + delta[2,s] * gov.eff[s,c,t-1]
                      + delta[3,s] * green.socialist[s,c,t-1]
                      + delta[4,s] * constraints[c,t-1]
      }
      tau.ps[s,c] ~ dgamma(0.1, 0.1)
      sigma.ps[s,c] <- 1 / sqrt(tau.ps[s,c])
      alpha.ps[s,c] ~ dnorm(0, 1^-2)
    }
    for (d in 1:4) {
      delta[d,s] ~ dnorm(0, 1^-2)
    }
  }
  # Mediated effects
```

```
  for (d in 1:nD) {
    for (s in 1:nS) {
      pi[1,s,d] <- delta[1,s] * beta[1,s,d]       # GDPpc
      pi[2,s,d] <- delta[2,s] * beta[4,s,d]       # gov.eff / administrative capacity / qog / vpi
      pi[3,s,d] <- delta[3,s] * beta[8,s,d]       # green
      pi[4,s,d] <- delta[4,s] * beta[9,s,d]       # constraints
    }
  }



  #
  # Missing data
  #
  for (c in 1:nC) {
    for (t in 1:nY) {
      gov.eff[1,c,t] ~ dnorm(mean(gov.eff.mean.observed[1,c]), 0.05^-2)
      gov.eff[2,c,t] ~ dnorm(gov.eff[1,c,t], 100)
      qog[c,t] ~ dnorm(mean(qog.mean.observed[c]), 0.05^-2)
      gdp.growth[c,t] ~ dnorm(gdp.growth.means[c], 0.05^-2)
      urban[c,t] ~ dnorm(urban.means[c], 0.05^-2)
      industry[c,t] ~ dnorm(industry.means[c], 0.05^-2)
    }
  }
  for (s in 1:nS) {
    for (c in 1:nC) {
      # Reverse years back for NA in early years
      for (t in 1:(nY-1)) {
        green.socialist[s,c,t] ~ dnorm(green.socialist[s,c,t+1], 0.05^-2)
      }
      for (d in 1:nD) {
        for (t in 1:(nY-1)) {
          interdependency.trade[d,s,c,t] ~ dnorm(interdependency.trade[d,s,c,t+1], 0.05^-2)
        }
      }
    }
  }
  for (s in 1:nS) {
    for (c in 1:nC) {
      vpi[s,c,1] ~ dnorm(0, 0.5^-2)
      for (t in 2:nY) {
        vpi[s,c,t] ~ dnorm(vpi[s,c,1], 100)
      }
    }
  }
}
```

References

Fernández-i-Marín, Xavier. 2020. "Using PolicyPortfolios". http://xavier-fim.net/post/using_policyportfolios/.