Appendix

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12/25/2019

Contents

Search criteria

Search terms

XXXX

Searched databases

XXXX To Catarina: name and URL of database searched

Summary total results

XXXX To Catarina: put here results per database, cross-matching, anything else

Exclusion criteria

Exclusion title and abstract XXXX To Catarina: what criteria for first round exclusions?

Exclusion reading XXXX To Catarina: criteria second round exclusions

Exclusion analysis For the articles that passed the first two filters, we looked into the tables and the reported coefficients. We kept articles in this step based on two criteria:

1. Matched treatment variable:

- N: Number Legislators Lower House
- logN: Log Number Legislators Lower House
- K: Number Legislators Upper House

2. Matched outcome variable:

- ExpPC: Expenditure Per Capita
- logExpPC: Log Expenditure Per Capita
- PCTGDP: Percent GDP Public Expenditure

PRISM

- Number of articles matching the search criteria: XXXX
- Number of articles excluded after title and abstract: XXXX
- Number of articles excluded after reading: XXXX
- Number of articles excluded before analysis: 3
- Number of articles excluded during the analysis: 0

We have 26 articles in the meta-analysis.

Meta-analysis dataset

The meta-analytic data is comprised of two datasets. The first dataset has the main coefficients that were reported in the paper. XXXX (Copiar da parte de métodos).

Adding articles

Descriptive statistics

Study Year

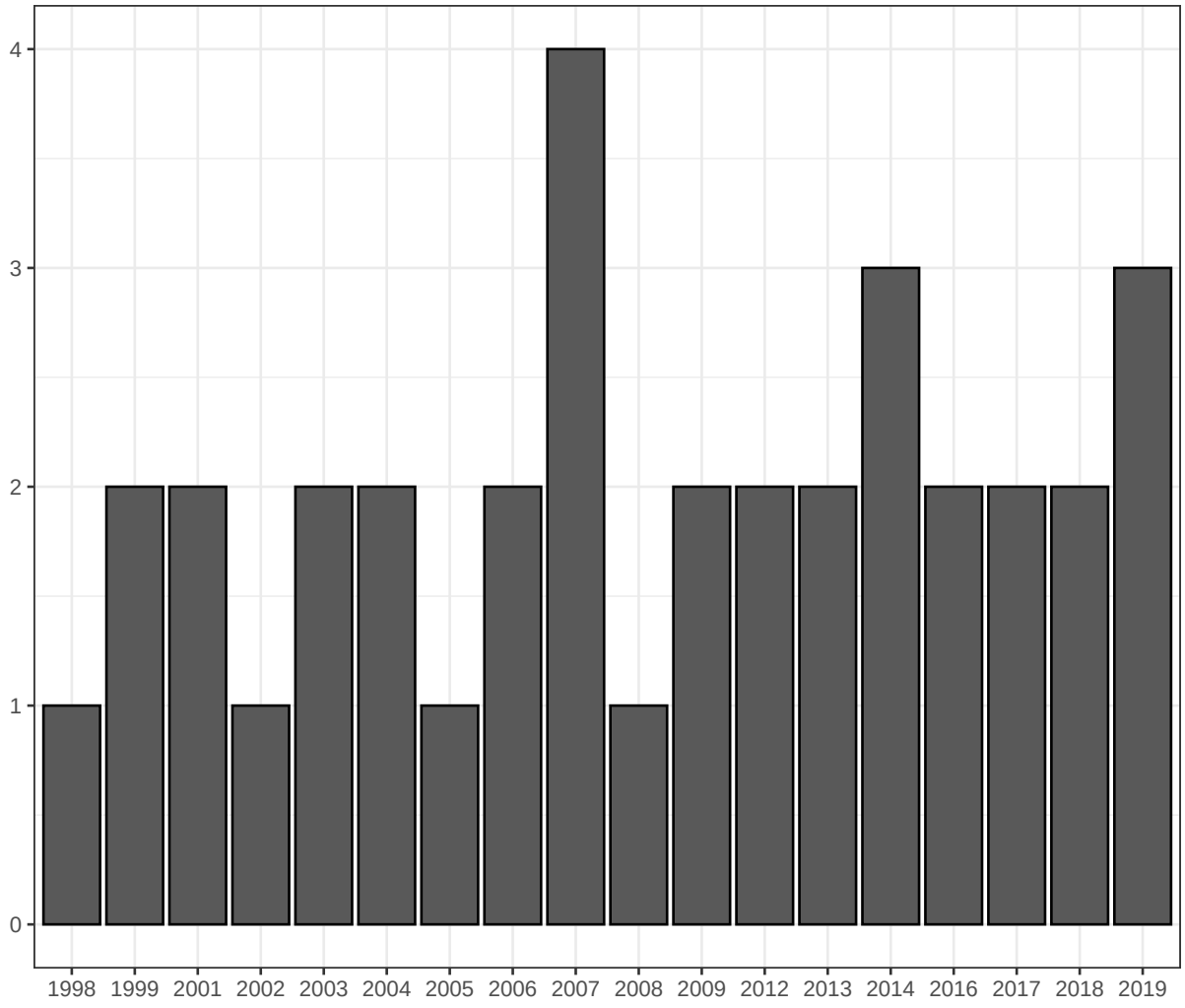


Figure 1: Study Year Frequencies

Published?

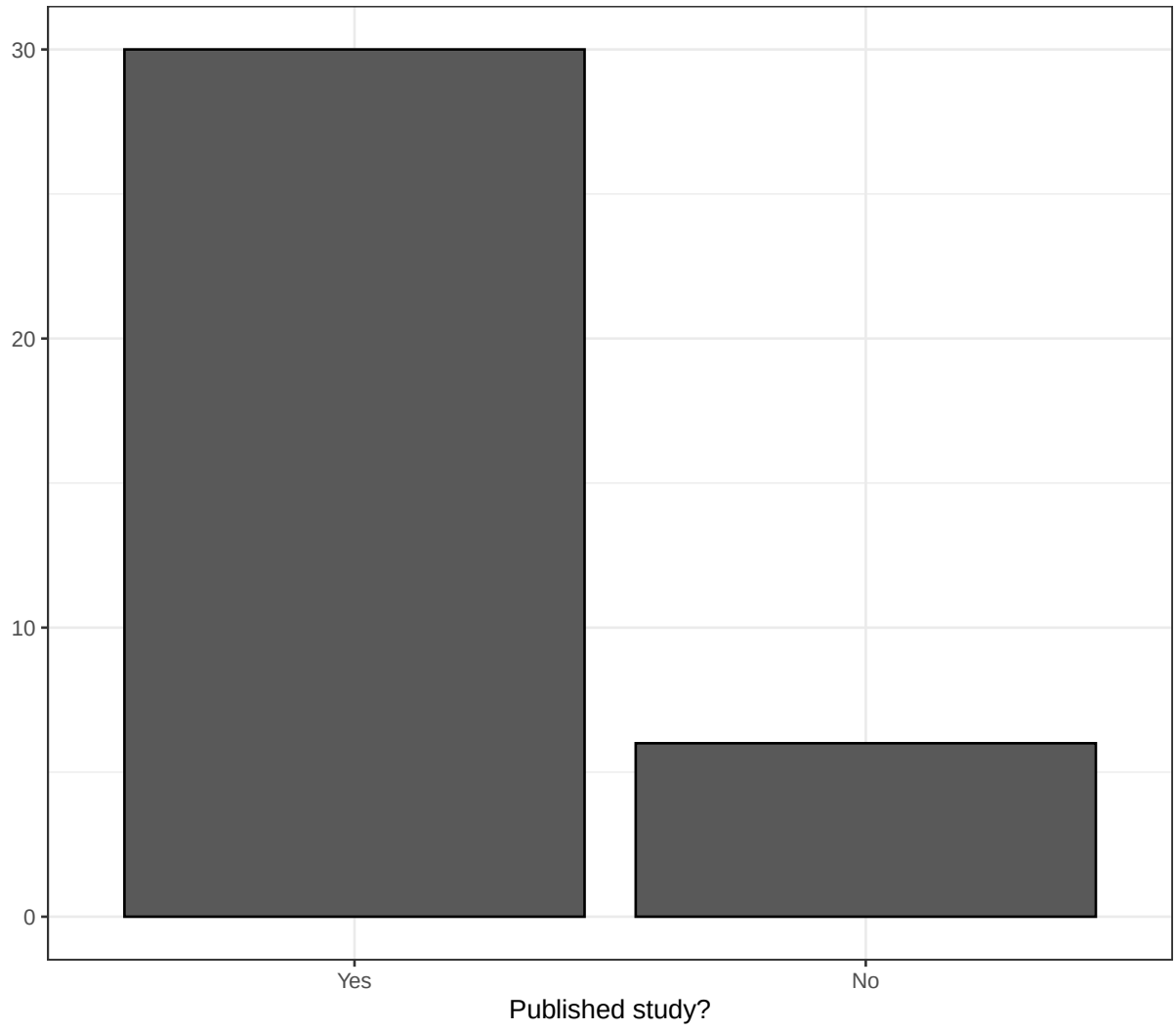


Figure 2: Was the study published?

Dependent variables

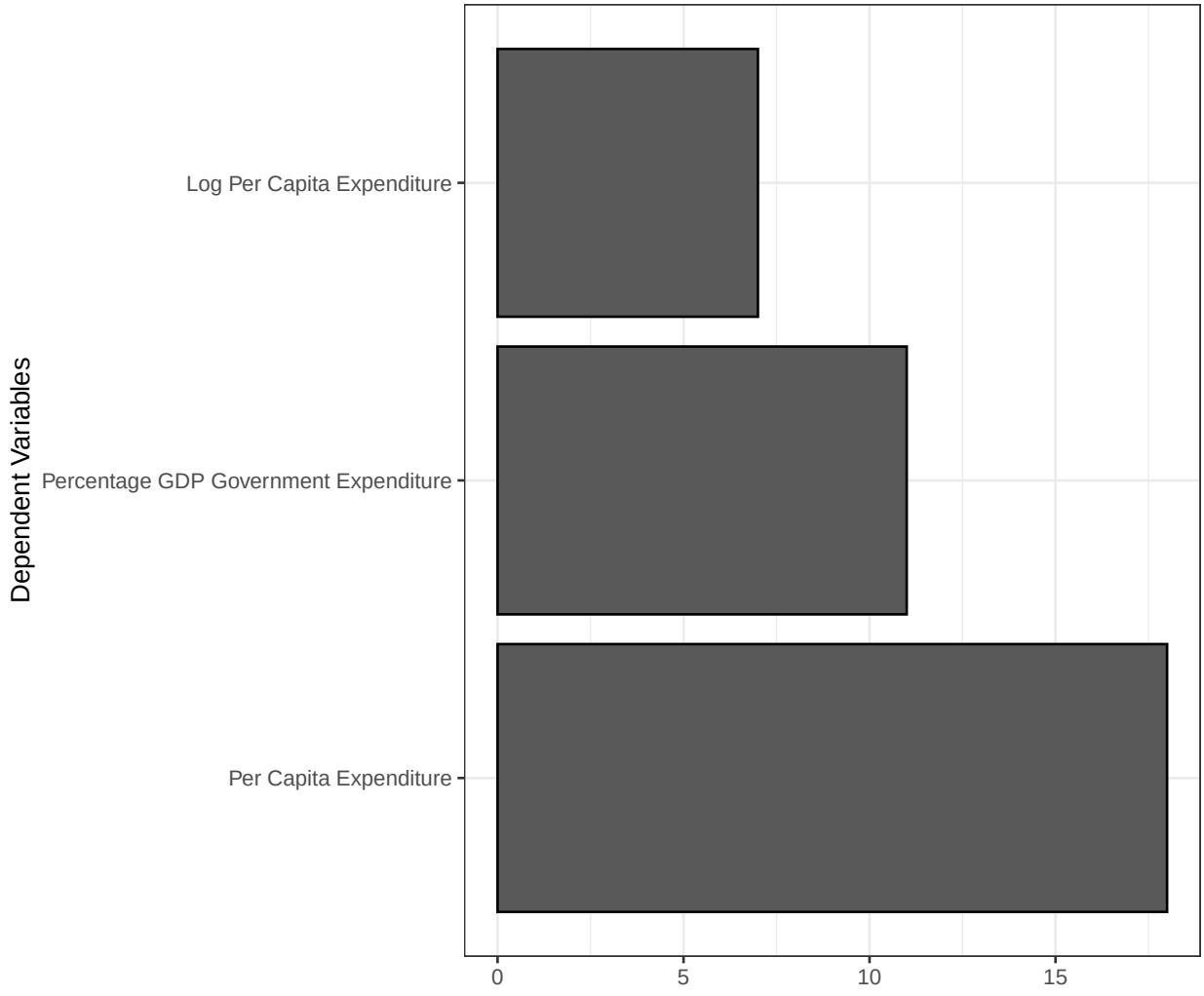


Figure 3: Dependent variables across the law of 1/n studies

Independent variables

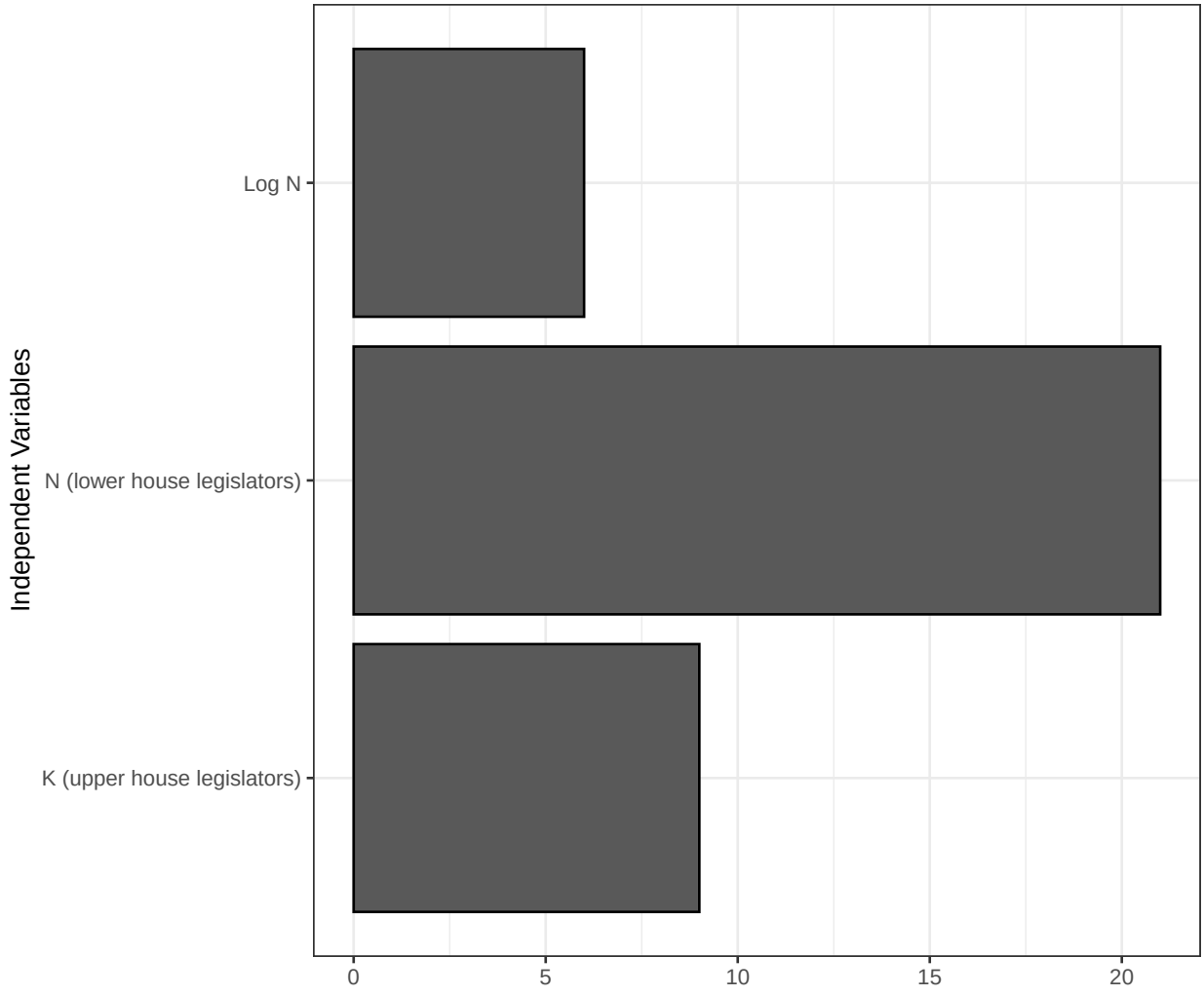


Figure 4: Independent variables across the law of 1/n studies

Histogram Coefficients

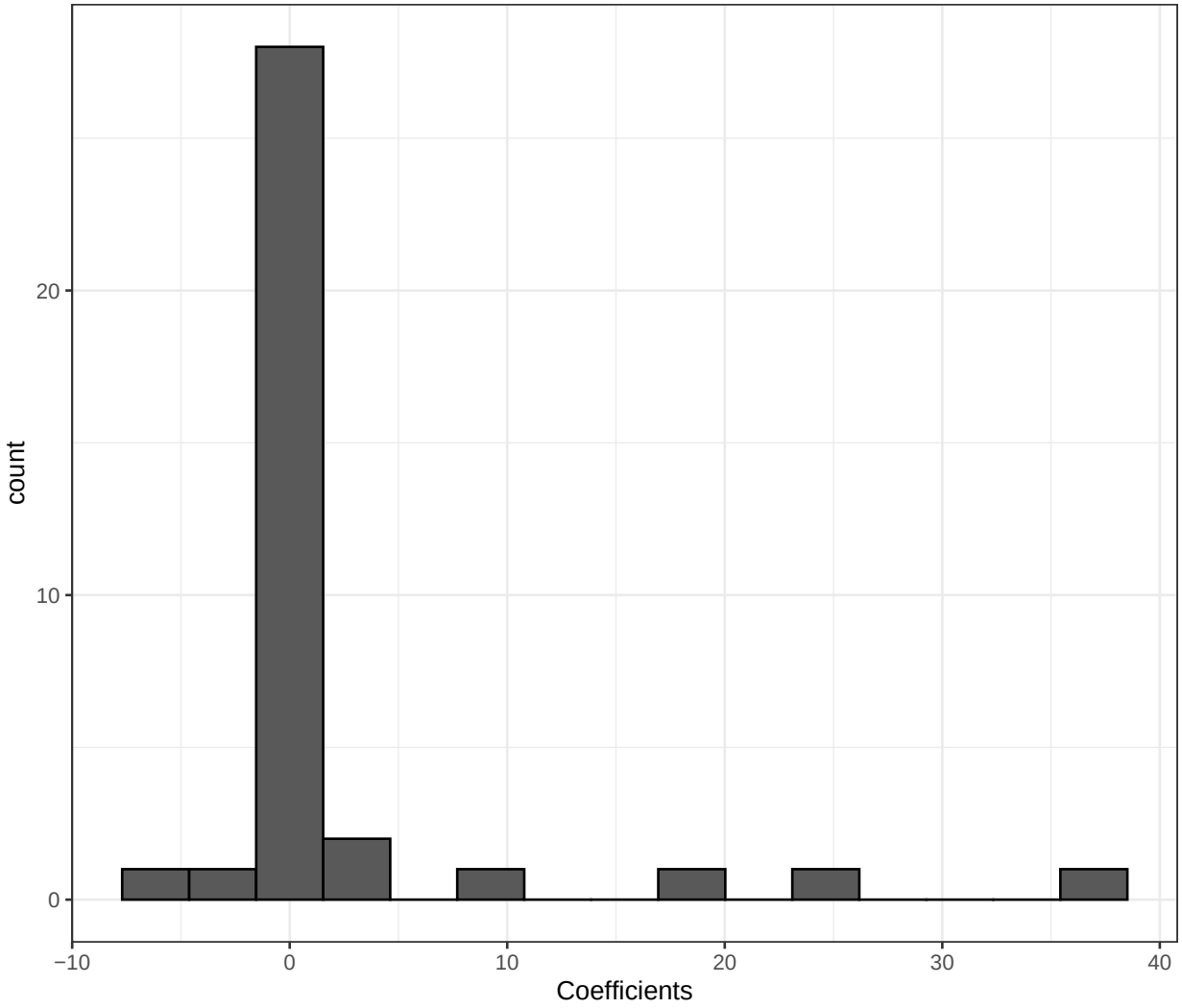


Figure 5: Histogram Coefficients

Histogram Standard Errors

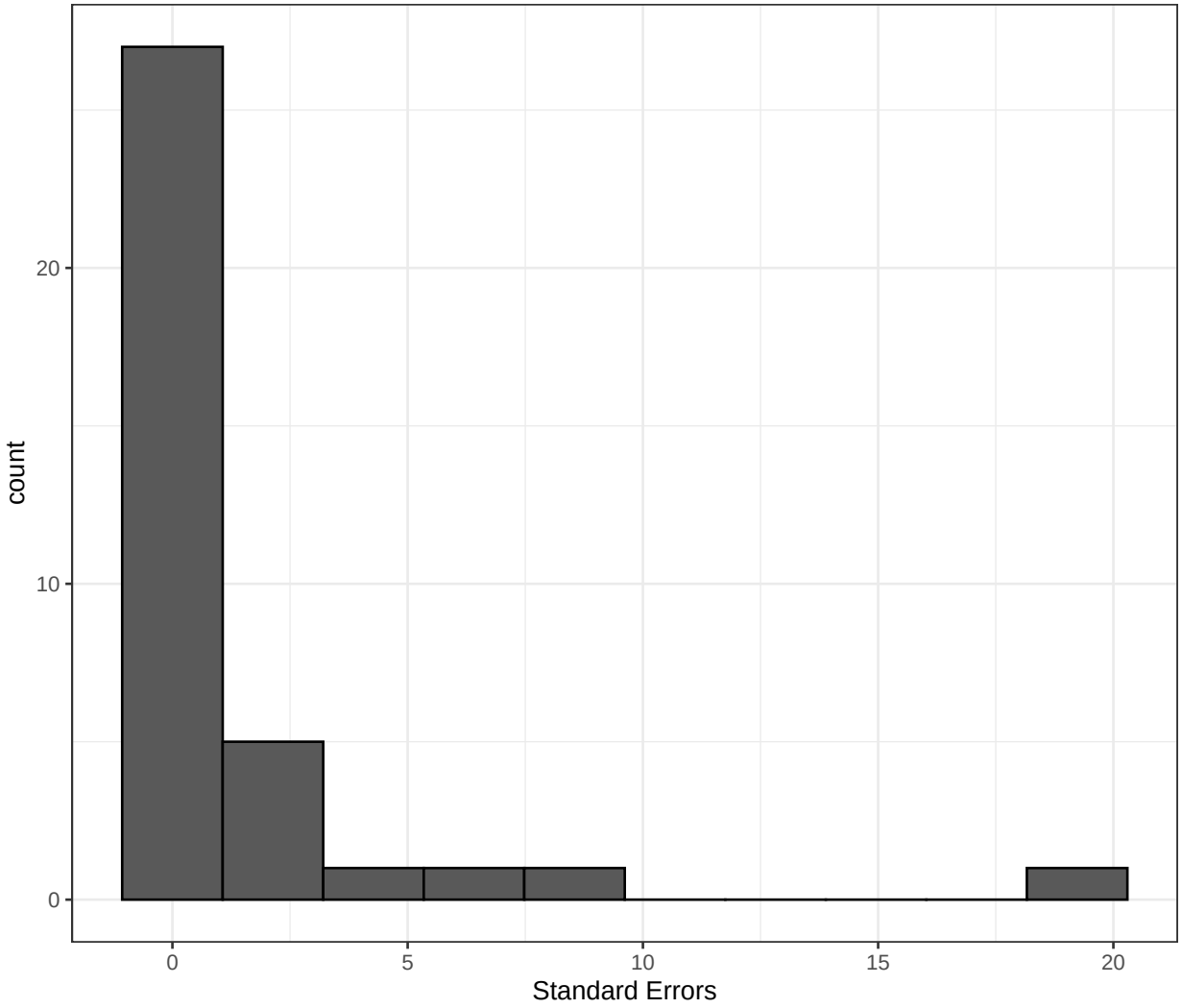


Figure 6: Histogram Standard Errors

Sign Coefficients

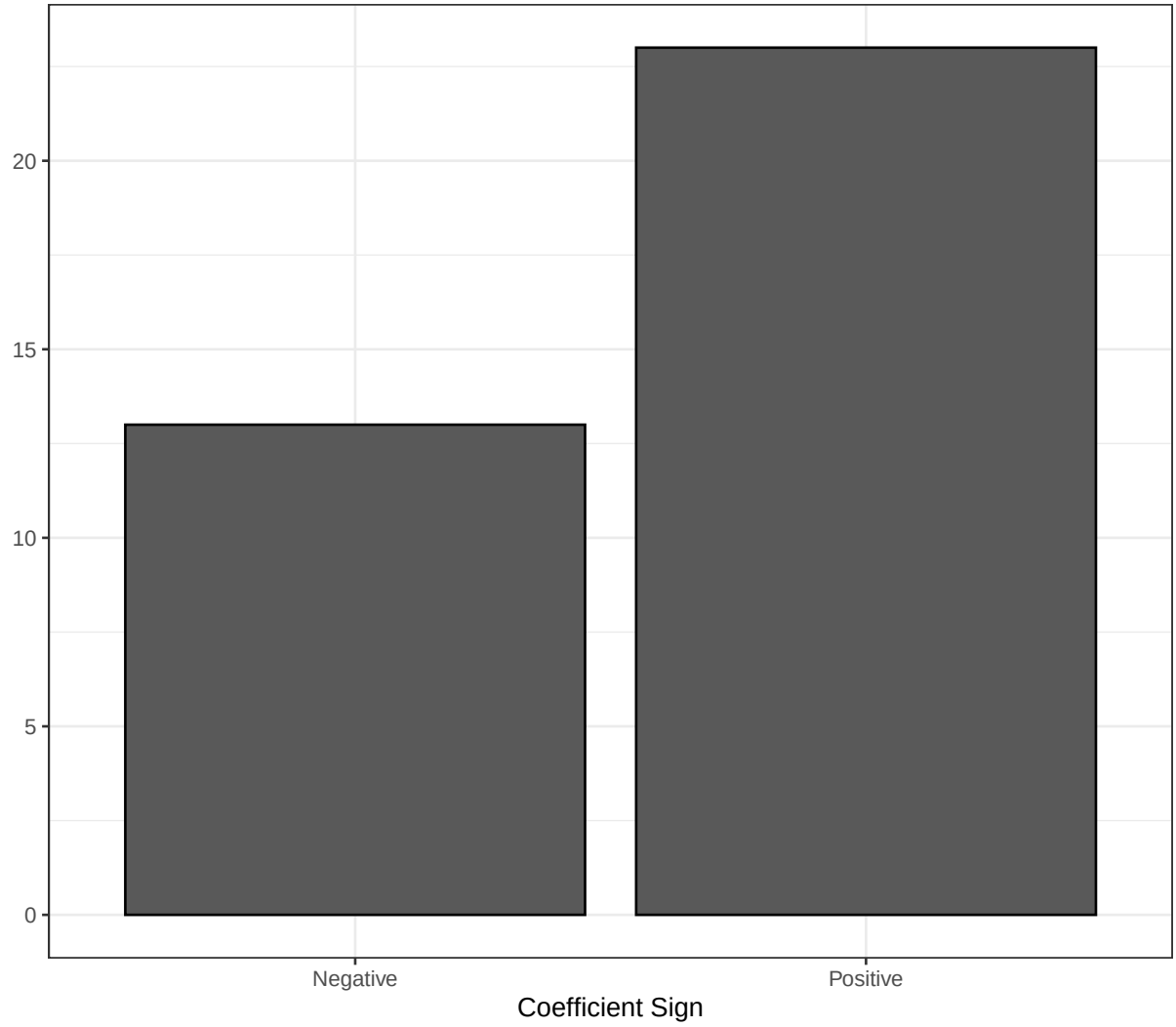


Figure 7: Coefficient Sign?

A general test of the theory would be to study whether the coefficients are positive or negative. Note that the law of 1/n would pose that we should have a positive influence of legislature size on expenditure. To test this theory, we run a Binomial One-Proportion Z-test. For the number of legislators in the lower house (N), the results follow below.

```
##
##  Exact binomial test
##
## data:  table(aux$scoef)[1] and sum(table(aux$scoef))
## number of successes = 11, number of trials = 21, p-value = 1
## alternative hypothesis: true probability of success is not equal to 0.5
## 95 percent confidence interval:
##  0.2978068 0.7428694
## sample estimates:
## probability of success
```

```
##              0.5238095
```

Therefore, the most elementary test we could run, a sign direction test, tells us that the law of 1/n does not hold for our sample. For the number of legislators in the upper house (K), the results follow below.

```
##
##  Exact binomial test
##
## data:  table(aux$scoef)[1] and sum(table(aux$scoef))
## number of successes = 1, number of trials = 9, p-value = 0.03906
## alternative hypothesis: true probability of success is not equal to 0.5
## 95 percent confidence interval:
##  0.002809137 0.482496515
## sample estimates:
## probability of success
##              0.1111111
```

Here, the law of 1/n holds. However, the effect goes in a direction different from the predicted in the law of k/n paper.

Electoral system

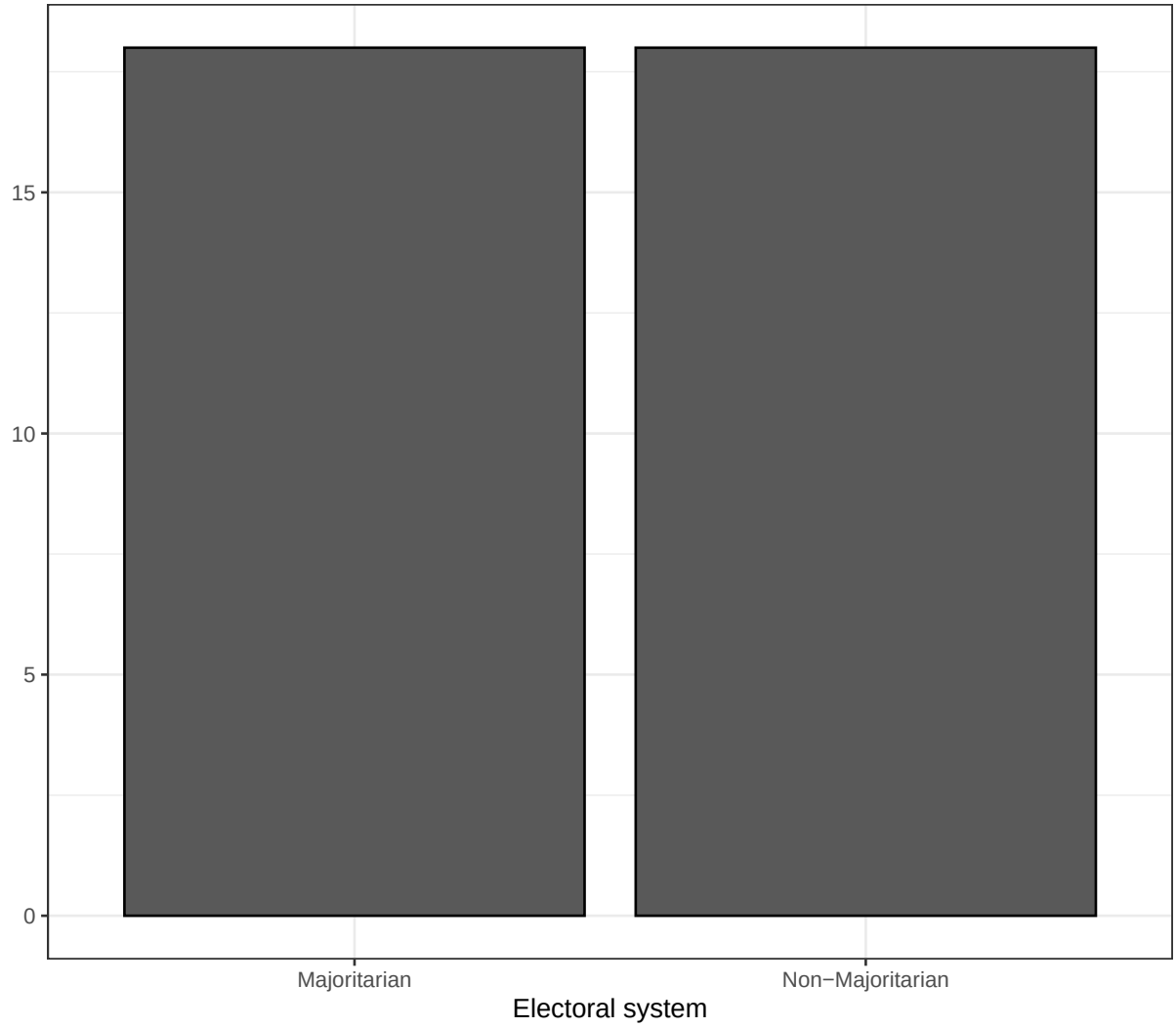


Figure 8: Electoral system

Electoral system x Sign Coefficient

```
##
##            Majoritarian Non-Majoritarian
##   Negative            5                8
##   Positive           13               10
```

```
##
##  Pearson's Chi-squared test with simulated p-value (based on 2000
##  replicates)
##
## data:  table(dat$scoef, dat$elecsys2)
## X-squared = 1.0836, df = NA, p-value = 0.4883
```

Independent Variable x Sign Coefficient

```
##
##             K  N logN
##   Negative  1 11    1
##   Positive  8 10    5
```

```
##
##  Pearson's Chi-squared test with simulated p-value (based on 2000
##  replicates)
##
## data:  table(dat$scoef, dat$indepvar2)
## X-squared = 5.8309, df = NA, p-value = 0.06397
```

Dependent variables x Independent variables

```
##
##            ExpPC PCTGDP logExpPC
##   Negative     6      4        3
##   Positive    12      7        4
```

```
##
##  Pearson's Chi-squared test with simulated p-value (based on 2000
##  replicates)
##
## data:  table(dat$scoef, dat$depvar2)
## X-squared = 0.19858, df = NA, p-value = 1
```

Meta-analysis

We combined the three independent variables (N, logN, and K) with the levels of the three dependent variables (ExpPC, logExpPC, PCTGDP). This formed a 3x3 possibility for our analysis.

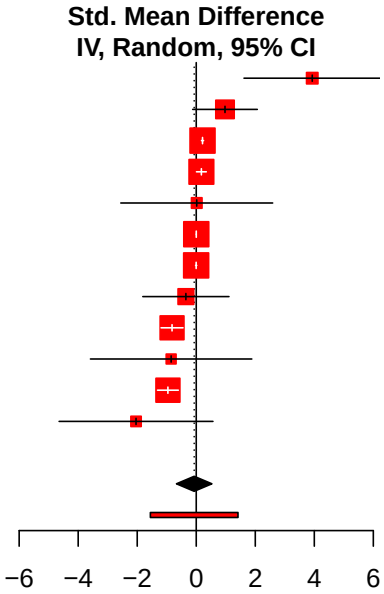
ExpPC x N

```
##                                SMD             95%-CI %W(random)
## Crowley (2019)              -0.3510 [-1.8112;  1.1092]        5.3
## Lee and Park (2018)         -0.8510 [-3.5851;  1.8831]        2.1
## Lee (2016)                   0.0164 [-2.5570;  2.5898]        2.4
## Kessler (2014)               0.1740 [ 0.0074;  0.3406]       13.1
## Bjedov et al. (2014)        -0.0030 [-0.0226;  0.0166]       13.4
## Baskaran (2013)              0.9740 [-0.1212;  2.0692]        7.3
## Erler (2007)                 3.9300 [ 1.6172;  6.2428]        2.8
## Chen and Malhotra (2007)    -2.0400 [-4.6468;  0.5668]        2.3
## Fiorino and Ricciuti (2007)  0.2130 [ 0.1777;  0.2483]       13.4
## Primo (2006)                -0.8200 [-1.1924; -0.4476]       12.2
## Matsusaka (2005)            -0.9600 [-1.3128; -0.6072]       12.3
## Schaltegger and Feld (2009)  0.0010 [-0.0010;  0.0030]       13.4
##
## Number of studies combined: k = 12
##
##                          SMD            95%-CI     t p-value
## Random effects model -0.0699 [-0.6712; 0.5314] -0.26  0.8028
## Prediction interval          [-1.5540; 1.4142]
##
## Quantifying heterogeneity:
##  tau^2 = 0.3690 [0.1794; 4.7570]; tau = 0.6075 [0.4236; 2.1810];
##  I^2 = 94.7% [92.3%; 96.3%]; H = 4.34 [3.61; 5.21]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  206.92   11 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Erler (2007)	3.93	1.1800	2.8%	3.93 [1.62; 6.24]
Baskaran (2013)	0.97	0.5588	7.3%	0.97 [−0.12; 2.07]
Fiorino and Ricciuti (2007)	0.21	0.0180	13.4%	0.21 [0.18; 0.25]
Kessler (2014)	0.17	0.0850	13.1%	0.17 [0.01; 0.34]
Lee (2016)	0.02	1.3130	2.4%	0.02 [−2.56; 2.59]
Schaltegger and Feld (2009)	0.00	0.0010	13.4%	0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0100	13.4%	−0.00 [−0.02; 0.02]
Crowley (2019)	−0.35	0.7450	5.3%	−0.35 [−1.81; 1.11]
Primo (2006)	−0.82	0.1900	12.2%	−0.82 [−1.19; −0.45]
Lee and Park (2018)	−0.85	1.3950	2.1%	−0.85 [−3.59; 1.88]
Matsusaka (2005)	−0.96	0.1800	12.3%	−0.96 [−1.31; −0.61]
Chen and Malhotra (2007)	−2.04	1.3300	2.3%	−2.04 [−4.65; 0.57]
Total (95% CI)			**100.0%**	**−0.07 [−0.67; 0.53]**
Prediction interval				**[−1.55; 1.41]**

Heterogeneity: Tau^2 = 0.3690; Chi^2 = 206.92, df = 11 (P < 0.01); I^2 = 95%



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Erler (2007)	3.93	1.1800	2.8%	3.93 [1.62; 6.24]
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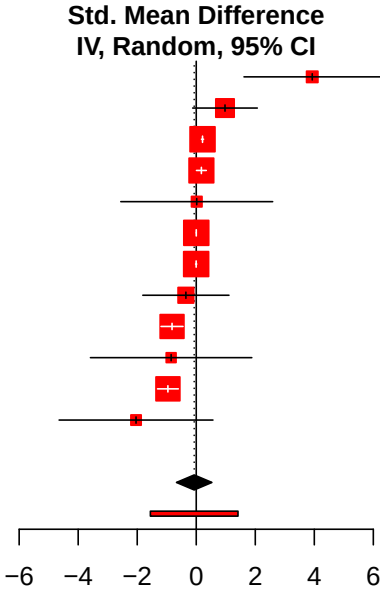
Fiorino and Ricciuti (2007)	0.21	0.0180	13.4%	0.21 [0.18; 0.25]
Kessler (2014)	0.17	0.0850	13.1%	0.17 [0.01; 0.34]
Lee (2016)	0.02	1.3130	2.4%	0.02 [−2.56; 2.59]
Schaltegger and Feld (2009)	0.00	0.0010	13.4%	0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0100	13.4%	−0.00 [−0.02; 0.02]
Crowley (2019)	−0.35	0.7450	5.3%	−0.35 [−1.81; 1.11]
Primo (2006)	−0.82	0.1900	12.2%	−0.82 [−1.19; −0.45]
Lee and Park (2018)	−0.85	1.3950	2.1%	−0.85 [−3.59; 1.88]
Matsusaka (2005)	−0.96	0.1800	12.3%	−0.96 [−1.31; −0.61]
Chen and Malhotra (2007)	−2.04	1.3300	2.3%	−2.04 [−4.65; 0.57]
Total (95% CI)			**100.0%**	**−0.07 [−0.67; 0.53]**
Prediction interval				**[−1.55; 1.41]**

Heterogeneity: Tau^2 = 0.3690; Chi^2 = 206.92, df = 11 (P < 0.01); I^2 = 95%



Highlights:

1. The results are highly heterogeneous: $I^2 = $ 94.68.
2. The Random effects modem SMD estimated is $g = $ -0.07 ($SE = 0.273$).
3. The prediction interval ranges from -1.55 to 1.41. Therefore, it emcompasses zero.

Electoral system subgroup analysis The law of 1/n was created for majoritarian systems. In the theoretical section below, we explain why the argument have potential issues when applied to non-majoritarian electoral systems. We estimated a subgroup analysis using a binary electoral system.

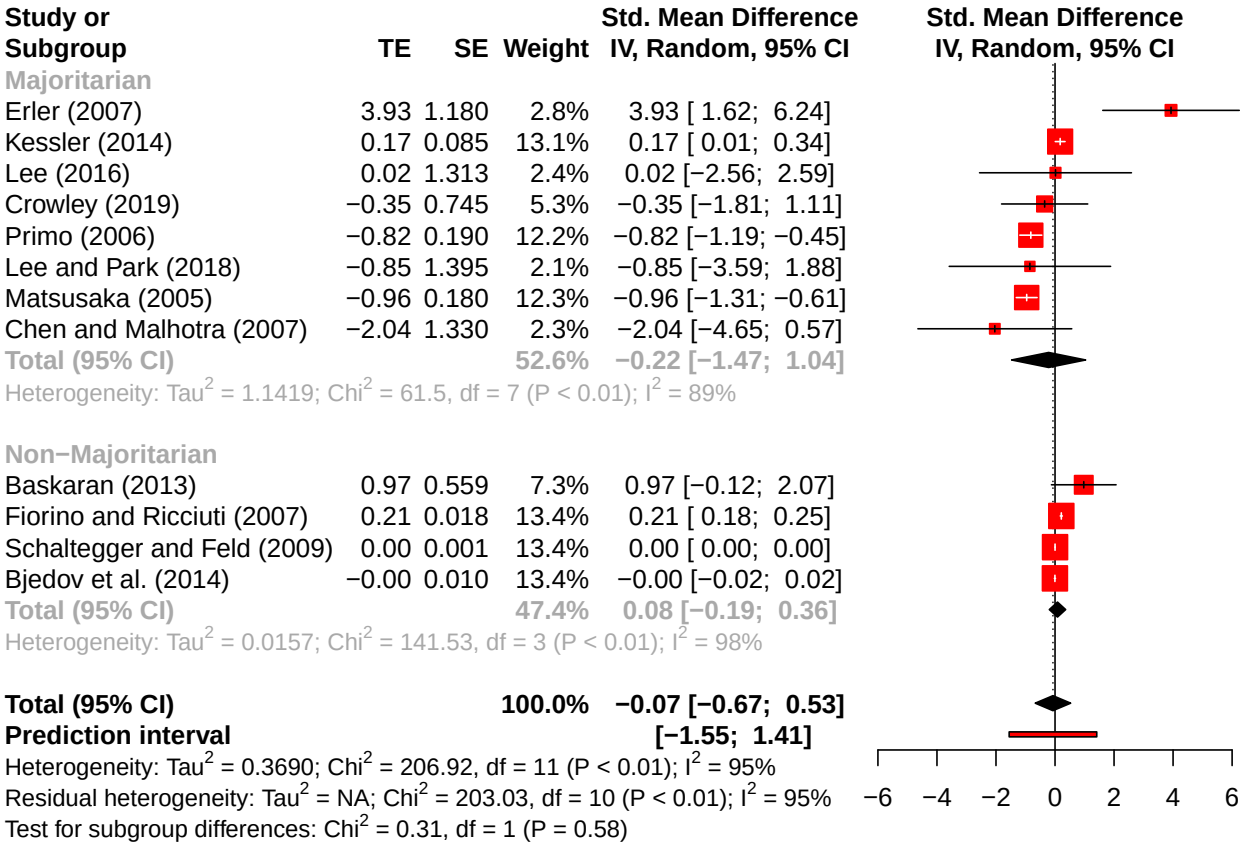


Figure 9: Subgroup Analysis of (N) x (ExpPC), controlling by electoral system

Therefore, we can see that the hypothesis that majoritarian systems produce systematic positive effects was disproved. The majoritarian systems in the sample had a random effects model estimate of -0.25, while the random effects model in the non-majoritarian subgroup fitted a value of 0.08. Both are non-significant, but they reassure us that the absense of effect is not caused by pooling multiple types of electoral systems.

PCTGDP x N

This model fits the random effects for the percentage of GDP as public expenditure as the main outcome, and the size of lower house as the main treatment variable.

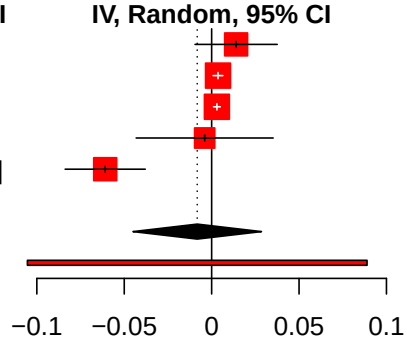
```
# Pooling effects analysis -- PCTGDP x N
aux <- dat %>%
  filter(indepvar2 == 'N',
         depvar2 == 'PCTGDP')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                                SMD             95%-CI %W(random)
## Bjedov et al. (2014)      -0.0040 [-0.0432;  0.0352]       15.1
## Maldonado (2013)          -0.0609 [-0.0838; -0.0380]       19.5
## Mukherjee (2003)           0.0030 [ 0.0010;  0.0050]       23.0
## Bradbury and Crain (2001)  0.0036 [ 0.0008;  0.0065]       23.0
## Ricciuti (2004)            0.0140 [-0.0095;  0.0375]       19.4
##
## Number of studies combined: k = 5
##
##                           SMD            95%-CI     t p-value
## Random effects model -0.0083 [-0.0450; 0.0285] -0.62  0.5667
## Prediction interval          [-0.1054; 0.0889]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0008 [0.0002; 0.0072]; tau = 0.0275 [0.0129; 0.0849];
##  I^2 = 87.1% [72.2%; 94.0%]; H = 2.78 [1.90; 4.08]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  30.97    4 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

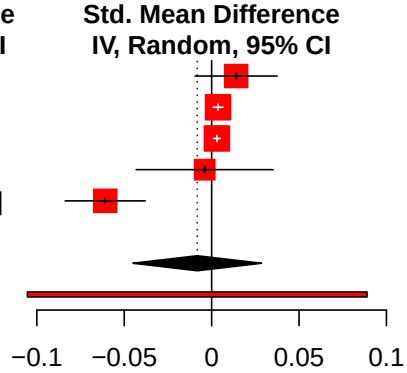
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Ricciuti (2004)	0.01	0.0120	19.4%	0.01 [−0.01; 0.04]
Bradbury and Crain (2001)	0.00	0.0014	23.0%	0.00 [0.00; 0.01]
Mukherjee (2003)	0.00	0.0010	23.0%	0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0200	15.1%	−0.00 [−0.04; 0.04]
Maldonado (2013)	−0.06	0.0117	19.5%	−0.06 [−0.08; −0.04]
Total (95% CI)			**100.0%**	**−0.01 [−0.05; 0.03]**
Prediction interval				**[−0.11; 0.09]**

Heterogeneity: $Tau^2 = 0.0008$; $Chi^2 = 30.97$, df = 4 (P < 0.01); $I^2 = 87\%$



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Ricciuti (2004)	0.01	0.0120	19.4%	0.01 [−0.01; 0.04]
Bradbury and Crain (2001)	0.00	0.0014	23.0%	0.00 [0.00; 0.01]
Mukherjee (2003)	0.00	0.0010	23.0%	0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0200	15.1%	−0.00 [−0.04; 0.04]
Maldonado (2013)	−0.06	0.0117	19.5%	−0.06 [−0.08; −0.04]
Total (95% CI)			**100.0%**	**−0.01 [−0.05; 0.03]**
Prediction interval				**[−0.11; 0.09]**

Heterogeneity: $Tau^2 = 0.0008$; $Chi^2 = 30.97$, df = 4 (P < 0.01); $I^2 = 87\%$



Highlights:

1. The results are highly heterogeneous: $I^2 = 87.08\%$.
2. The Random effects modem SMD estimated is $g = -0.01$ ($SE = 0.013$).
3. The prediction interval ranges from -0.11 to 0.09. Therefore, it emcompasses zero.

logExpPC x N

This model estimates the Log of Per Capita Expenditure as the dependent variable, and the number of lower house legislators as the treatment variable.

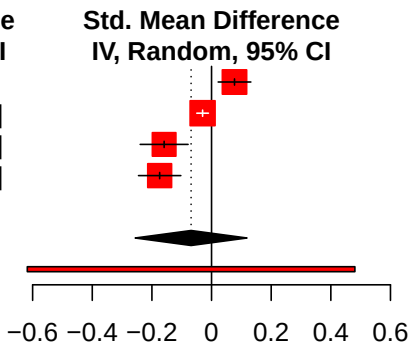
```
# Pooling effects analysis -- logExpPC x N
aux <- dat %>%
  filter(indepvar2 == 'N',
         depvar2 == 'logExpPC')

mod <- metagen(
  coef, SE, data=aux,
  studlab=paste(authoryear),
  comb.fixed = FALSE,
  comb.random = TRUE,
  method.tau = "REML",
  hakn = TRUE,
  prediction = TRUE,
  sm="SMD"
  )

mod
```

```
##                               SMD             95%-CI %W(random)
## Lewis (2019)              -0.1740 [-0.2450; -0.1030]       24.3
## Höhmann (2017)            -0.0300 [-0.0496; -0.0104]       26.6
## Drew and Dollery (2017)    0.0770 [ 0.0221;  0.1319]       25.3
## Pettersson-Lidbom (2012) -0.1590 [-0.2394; -0.0786]       23.7
##
## Number of studies combined: k = 4
##
##                           SMD            95%-CI     t p-value
## Random effects model -0.0686 [-0.2560; 0.1188] -1.17  0.3282
## Prediction interval          [-0.6179; 0.4807]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0128 [0.0034; 0.1933]; tau = 0.1133 [0.0584; 0.4396];
##  I^2 = 92.5% [84.1%; 96.5%]; H = 3.66 [2.51; 5.34]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  40.11    3 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

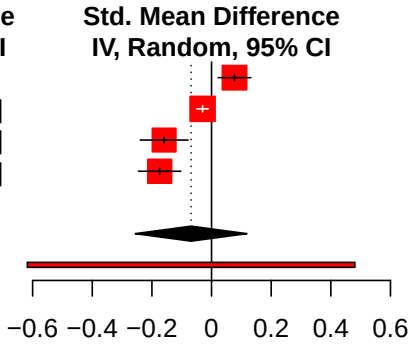
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Drew and Dollery (2017)	0.08	0.028	25.3%	0.08 [0.02; 0.13]
Höhmann (2017)	−0.03	0.010	26.6%	−0.03 [−0.05; −0.01]
Pettersson−Lidbom (2012)	−0.16	0.041	23.7%	−0.16 [−0.24; −0.08]
Lewis (2019)	−0.17	0.036	24.3%	−0.17 [−0.24; −0.10]
Total (95% CI)			**100.0%**	**−0.07 [−0.26; 0.12]**
Prediction interval				**[−0.62; 0.48]**

Heterogeneity: $Tau^2 = 0.0128$; $Chi^2 = 40.11$, df = 3 ($P < 0.01$); $I^2 = 93\%$



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Drew and Dollery (2017)	0.08	0.028	25.3%	0.08 [0.02; 0.13]
Höhmann (2017)	−0.03	0.010	26.6%	−0.03 [−0.05; −0.01]
Pettersson−Lidbom (2012)	−0.16	0.041	23.7%	−0.16 [−0.24; −0.08]
Lewis (2019)	−0.17	0.036	24.3%	−0.17 [−0.24; −0.10]
Total (95% CI)			**100.0%**	**−0.07 [−0.26; 0.12]**
Prediction interval				**[−0.62; 0.48]**

Heterogeneity: $Tau^2 = 0.0128$; $Chi^2 = 40.11$, df = 3 ($P < 0.01$); $I^2 = 93\%$



Highlights:

1. The results are highly heterogeneous: $I^2 = 92.52\%$.
2. The Random effects modem SMD estimated is $g = -0.07$ ($SE = 0.059$).
3. The prediction interval ranges from -0.62 to 0.48. Therefore, it emcompasses zero.

ExpPC x logN

There were no studies that had per capita expenditure in the dependent variable and log of lower house size in the treatment variable.

PCTGDP x logN

This meta-regression investigates the percentage of GDP as public expenditure as the dependent variable and the log lower house size (logN) as the treatment variable.

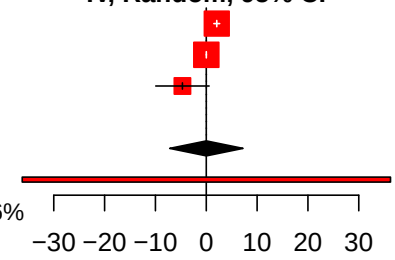
```
# Pooling effects analysis -- PCTGDP x logN
aux <- dat %>%
  filter(indepvar2 == 'logN',
         depvar2 == 'PCTGDP')

mod <- metagen(
  coef, SE, data=aux,
  studlab=paste(authoryear),
  comb.fixed = FALSE,
  comb.random = TRUE,
  method.tau = "REML",
  hakn = TRUE,
  prediction=TRUE,
  sm="SMD"
  )

mod
```

```
##                          SMD            95%-CI %W(random)
## Baqir (1999)          2.0660 [ 1.4887; 2.6433]       40.8
## Lledo (2003)         -4.6900 [-9.9427; 0.5627]       17.7
## Stein et al. (1998)   0.0109 [-0.0171; 0.0389]       41.5
##
## Number of studies combined: k = 3
##
##                          SMD              95%-CI    t p-value
## Random effects model 0.0203 [ -7.1961;  7.2367] 0.01  0.9914
## Prediction interval         [-36.2058; 36.2465]
##
## Quantifying heterogeneity:
##  tau^2 = 5.3156 [0.5756; >100.0000]; tau = 2.3056 [0.7587; >10.0000];
##  I^2 = 96.1% [91.8%; 98.2%]; H = 5.08 [3.48; 7.42]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  51.65    2 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

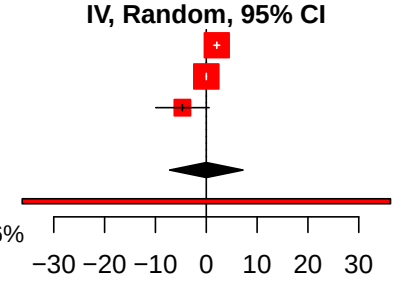
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (1999)	2.07	0.295	40.8%	2.07 [1.49; 2.64]
Stein et al. (1998)	0.01	0.014	41.5%	0.01 [−0.02; 0.04]
Lledo (2003)	−4.69	2.680	17.7%	−4.69 [−9.94; 0.56]
Total (95% CI)			**100.0%**	**0.02 [−7.20; 7.24]**
Prediction interval				**[−36.21; 36.25]**

Heterogeneity: $Tau^2 = 5.3156$; $Chi^2 = 51.65$, df = 2 (P < 0.01); $I^2 = 96\%$



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (1999)	2.07	0.295	40.8%	2.07 [1.49; 2.64]
Stein et al. (1998)	0.01	0.014	41.5%	0.01 [−0.02; 0.04]
Lledo (2003)	−4.69	2.680	17.7%	−4.69 [−9.94; 0.56]
Total (95% CI)			**100.0%**	**0.02 [−7.20; 7.24]**
Prediction interval				**[−36.21; 36.25]**

Heterogeneity: $Tau^2 = 5.3156$; $Chi^2 = 51.65$, df = 2 (P < 0.01); $I^2 = 96\%$



Highlights:

1. The results are highly heterogeneous: $I^2 = 96.13.
2. The Random effects modem SMD estimated is $g = 0.02 ($SE = 1.677$).
3. The prediction interval ranges from -36.21 to 36.25. Therefore, it emcompasses zero.

logExpPC x logN

In this specification, we study the log of per capita expenditure (logExpPC) as a function of the log of lower house size (logN).

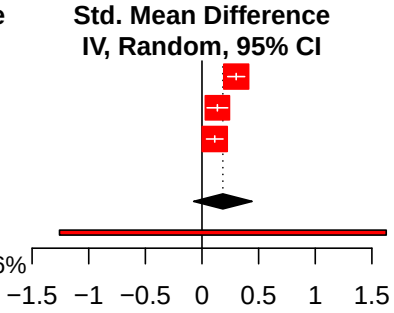
```
# Pooling effects analysis -- logExpPC x logN
aux <- dat %>%
  filter(indepvar2 == 'logN',
         depvar2 == 'logExpPC')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                      SMD           95%-CI %W(random)
## MacDonald (2008) 0.1360 [0.0447; 0.2273]       31.9
## Baqir (2002)     0.1127 [0.0396; 0.1858]       34.2
## Baqir (1999)     0.3020 [0.2269; 0.3771]       33.9
##
## Number of studies combined: k = 3
##
##                          SMD            95%-CI    t p-value
## Random effects model 0.1844 [-0.0738; 0.4425] 3.07  0.0916
## Prediction interval         [-1.2580; 1.6267]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0093 [0.0014; 0.4193]; tau = 0.0964 [0.0372; 0.6476];
##  I^2 = 85.9% [59.0%; 95.2%]; H = 2.66 [1.56; 4.54]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  14.18    2  0.0008
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

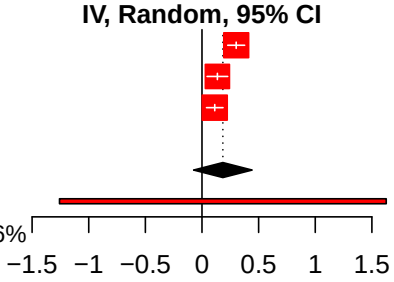
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (1999)	0.30	0.038	33.9%	0.30 [0.23; 0.38]
MacDonald (2008)	0.14	0.047	31.9%	0.14 [0.04; 0.23]
Baqir (2002)	0.11	0.037	34.2%	0.11 [0.04; 0.19]
Total (95% CI)			**100.0%**	**0.18 [−0.07; 0.44]**
Prediction interval				**[−1.26; 1.63]**

Heterogeneity: Tau^2 = 0.0093; Chi^2 = 14.18, df = 2 (P < 0.01); I^2 = 86%



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (1999)	0.30	0.038	33.9%	0.30 [0.23; 0.38]
MacDonald (2008)	0.14	0.047	31.9%	0.14 [0.04; 0.23]
Baqir (2002)	0.11	0.037	34.2%	0.11 [0.04; 0.19]
Total (95% CI)			**100.0%**	**0.18 [−0.07; 0.44]**
Prediction interval				**[−1.26; 1.63]**

Heterogeneity: Tau^2 = 0.0093; Chi^2 = 14.18, df = 2 (P < 0.01); I^2 = 86%



Highlights:

1. The results are highly heterogeneous: $I^2 = 85.9.
2. The Random effects modem SMD estimated is $g = $ 0.18 ($SE = 0.06$). **This model is significant at the 10% confidence level.**
3. The prediction interval ranges from -1.26 to 1.63. Therefore, it emcompasses zero.

ExpPC x K

Now we are investigating the upper house size (K). In this model, we investigate the effect of upper house size on expenditure per capita (ExpPC).

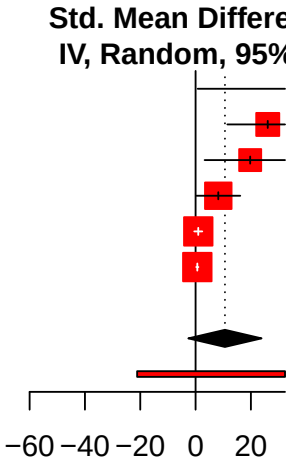
```
# Pooling effects analysis -- ExpPC x K
aux <- dat %>%
  filter(indepvar2 == 'K',
         depvar2 == 'ExpPC')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                                    SMD             95%-CI %W(random)
## Crowley (2019)                  8.2100 [ 0.2702; 16.1498]       20.0
## Lee and Park (2018)            19.7400 [ 3.2645; 36.2155]       13.8
## Lee (2016)                     38.4400 [ 0.7499; 76.1301]        5.1
## Bradbury and Stephenson (2009)  0.6240 [ 0.2295;  1.0185]       23.1
## Chen and Malhotra (2007)       26.0900 [11.4883; 40.6917]       15.1
## Primo (2006)                    0.9700 [-0.4804;  2.4204]       23.0
##
## Number of studies combined: k = 6
##
##                           SMD              95%-CI    t p-value
## Random effects model 10.6134 [ -2.6210; 23.8479] 2.06  0.0943
## Prediction interval          [-21.1303; 42.3571]
##
## Quantifying heterogeneity:
##  tau^2 = 104.2124 [20.3551; >1042.1236]; tau = 10.2084 [4.5117; >32.2819];
##  I^2 = 79.4% [55.1%; 90.6%]; H = 2.20 [1.49; 3.26]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  24.31    5  0.0002
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

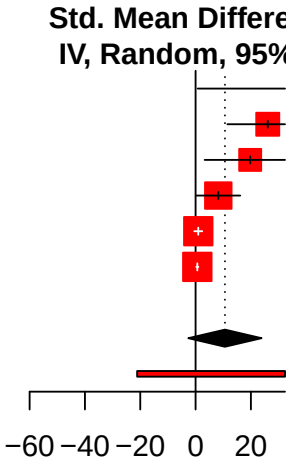
	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
6)	38.44	19.230	5.1%	38.44 [0.75; 76.13]
l Malhotra (2007)	26.09	7.450	15.1%	26.09 [11.49; 40.69]
Park (2018)	19.74	8.406	13.8%	19.74 [3.26; 36.22]
2019)	8.21	4.051	20.0%	8.21 [0.27; 16.15]
)06)	0.97	0.740	23.0%	0.97 [−0.48; 2.42]
and Stephenson (2009)	0.62	0.201	23.1%	0.62 [0.23; 1.02]
% CI)			**100.0%**	**10.61 [−2.62; 23.85]**
n interval				**[−21.13; 42.36]**

neity: Tau^2 = 104.2124; Chi^2 = 24.31, df = 5 (P < 0.01); I^2 = 79%



	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
6)	38.44	19.230	5.1%	38.44 [0.75; 76.13]
l Malhotra (2007)	26.09	7.450	15.1%	26.09 [11.49; 40.69]
Park (2018)	19.74	8.406	13.8%	19.74 [3.26; 36.22]
2019)	8.21	4.051	20.0%	8.21 [0.27; 16.15]
)06)	0.97	0.740	23.0%	0.97 [−0.48; 2.42]
and Stephenson (2009)	0.62	0.201	23.1%	0.62 [0.23; 1.02]
% CI)			**100.0%**	**10.61 [−2.62; 23.85]**
n interval				**[−21.13; 42.36]**

neity: Tau^2 = 104.2124; Chi^2 = 24.31, df = 5 (P < 0.01); I^2 = 79%



Highlights:

1. The results are highly heterogeneous: $I^2 = $ 79.43.
2. The Random effects modem SMD estimated is $g = $ 10.61 ($SE = 5.148$).
3. The prediction interval ranges from -21.13 to 42.36. Therefore, it emcompasses zero.

PCTGDP x K

This model looks into the effect of upper house size (K) on the public expenditure share of the GDP (PCTGDP).

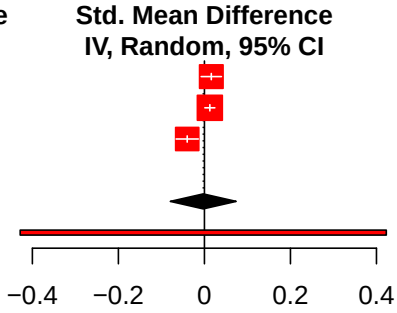
```
# Pooling effects analysis -- PCTGDP x K
aux <- dat %>%
  filter(indepvar2 == 'K',
         depvar2 == 'PCTGDP')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                                SMD             95%-CI %W(random)
## Maldonado (2012)           -0.0400 [-0.0659; -0.0141]       31.3
## Bradbury and Crain (2001)   0.0126 [ 0.0010;  0.0243]       36.4
## Ricciuti (2004)             0.0160 [-0.0075;  0.0395]       32.3
##
## Number of studies combined: k = 3
##
##                           SMD            95%-CI     t p-value
## Random effects model -0.0027 [-0.0793; 0.0738] -0.15  0.8915
## Prediction interval          [-0.4284; 0.4229]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0008 [0.0001; 0.0388]; tau = 0.0284 [0.0101; 0.1970];
##  I^2 = 85.8% [58.6%; 95.1%]; H = 2.65 [1.55; 4.53]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  14.07    2  0.0009
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

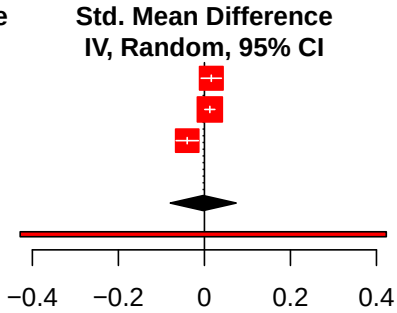
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Ricciuti (2004)	0.02	0.012	32.3%	0.02 [−0.01; 0.04]
Bradbury and Crain (2001)	0.01	0.006	36.4%	0.01 [0.00; 0.02]
Maldonado (2012)	−0.04	0.013	31.3%	−0.04 [−0.07; −0.01]
Total (95% CI)			**100.0%**	**−0.00 [−0.08; 0.07]**
Prediction interval				**[−0.43; 0.42]**

Heterogeneity: $Tau^2 = 0.0008$; $Chi^2 = 14.07$, df = 2 ($P < 0.01$); $I^2 = 86\%$



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Ricciuti (2004)	0.02	0.012	32.3%	0.02 [−0.01; 0.04]
Bradbury and Crain (2001)	0.01	0.006	36.4%	0.01 [0.00; 0.02]
Maldonado (2012)	−0.04	0.013	31.3%	−0.04 [−0.07; −0.01]
Total (95% CI)			**100.0%**	**−0.00 [−0.08; 0.07]**
Prediction interval				**[−0.43; 0.42]**

Heterogeneity: $Tau^2 = 0.0008$; $Chi^2 = 14.07$, df = 2 ($P < 0.01$); $I^2 = 86\%$



Highlights:

1. The results are highly heterogeneous: $I^2 = 85.79\%$.
2. The Random effects modem SMD estimated is $g = 0$ ($SE = 0.018$).
3. The prediction interval ranges from -0.43 to 0.42. Therefore, it emcompasses zero.

logExpPC x K

No studies related the log of per capita expenditure with the size of upper house (K).

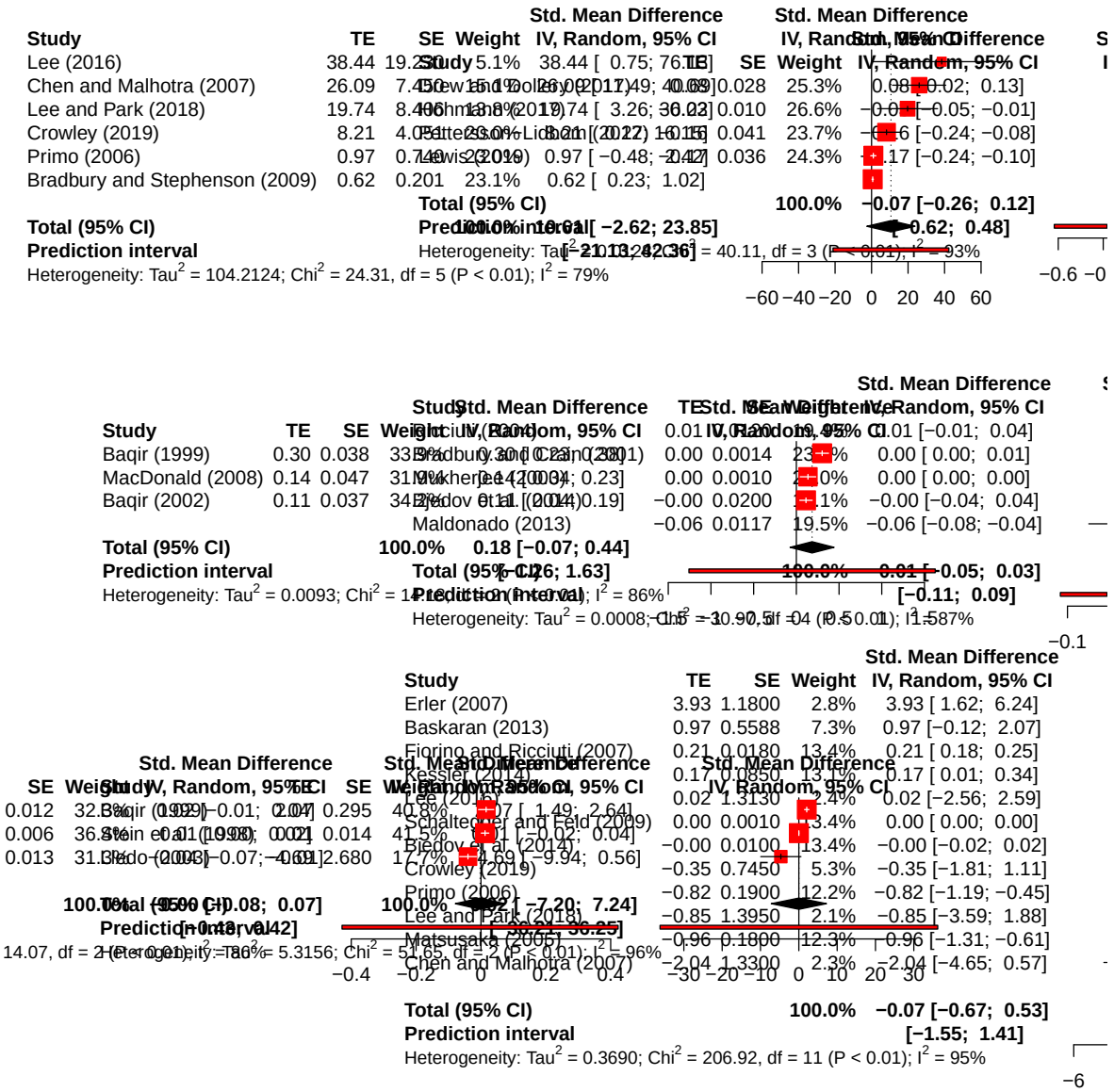


Figure 10: test size

Meta-Analysis (all coefficients)

ExpPC x N

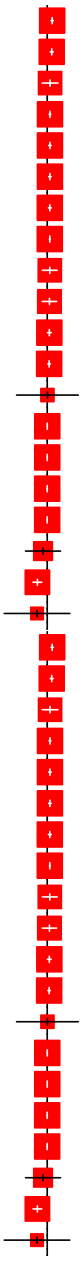
```
## Warning in rma.uni(yi = TE[sel], sei = seTE[sel], method = method.tau, control
## = control): Ratio of largest to smallest sampling variance extremely large. May
## not be able to obtain stable results.
```

```
##                                SMD             95%-CI %W(random)
## Crowley (2019)              -0.3510 [-1.8112;  1.1092]        2.0
## Crowley (2019)               5.9750 [ 0.7889; 11.1611]        0.3
## Crowley (2019)               7.6580 [-0.0290; 15.3450]        0.2
## Lee and Park (2018)         -0.8510 [-3.5851;  1.8831]        0.9
## Lee and Park (2018)         -1.6890 [-3.0551; -0.3229]        2.1
## Lee and Park (2018)          7.6320 [ 3.1064; 12.1576]        0.4
## Lee (2016)                   0.0164 [-2.5570;  2.5898]        1.0
## Kessler (2014)               0.1740 [ 0.0074;  0.3406]        3.6
## Kessler (2014)               0.2230 [ 0.1211;  0.3249]        3.6
## Kessler (2014)               0.2150 [ 0.0954;  0.3346]        3.6
## Kessler (2014)               0.1580 [ 0.0522;  0.2638]        3.6
## Bjedov et al. (2014)        -0.0030 [-0.0226;  0.0166]        3.6
## Bjedov et al. (2014)        -0.0060 [-0.0256;  0.0136]        3.6
## Baskaran (2013)              0.9740 [-0.1212;  2.0692]        2.5
## Erler (2007)                 3.9300 [ 1.6172;  6.2428]        1.2
## Chen and Malhotra (2007)    -2.0400 [-4.6468;  0.5668]        1.0
## Chen and Malhotra (2007)    -1.4000 [-2.6544; -0.1456]        2.3
## Fiorino and Ricciuti (2007)  0.2130 [ 0.1777;  0.2483]        3.6
## Fiorino and Ricciuti (2007)  0.2290 [ 0.1565;  0.3015]        3.6
## Fiorino and Ricciuti (2007)  0.4550 [ 0.3805;  0.5295]        3.6
## Fiorino and Ricciuti (2007)  0.4110 [ 0.3150;  0.5070]        3.6
## Fiorino and Ricciuti (2007)  0.2260 [ 0.1221;  0.3299]        3.6
## Fiorino and Ricciuti (2007)  0.2130 [-0.4083;  0.8343]        3.1
## Fiorino and Ricciuti (2007)  0.1850 [-0.4128;  0.7828]        3.2
## Fiorino and Ricciuti (2007)  0.2350 [-0.4235;  0.8935]        3.1
## Fiorino and Ricciuti (2007)  0.3740 [ 0.2486;  0.4994]        3.6
## Fiorino and Ricciuti (2007)  0.8110 [ 0.4562;  1.1658]        3.4
## Fiorino and Ricciuti (2007)  0.7950 [ 0.4500;  1.1400]        3.5
## Fiorino and Ricciuti (2007)  0.8490 [ 0.3825;  1.3155]        3.3
## Primo (2006)                -0.8200 [-1.1924; -0.4476]        3.4
## Primo (2006)                -1.7000 [-2.3076; -1.0924]        3.2
## Primo (2006)                -2.3700 [-3.0952; -1.6448]        3.0
## Primo (2006)                -2.0300 [-2.7552; -1.3048]        3.0
## Matsusaka (2005)            -0.9600 [-1.3128; -0.6072]        3.4
## Schaltegger and Feld (2009)  0.0010 [-0.0010;  0.0030]        3.6
## Schaltegger and Feld (2009) -0.0010 [-0.0030;  0.0010]        3.6
##
## Number of studies combined: k = 36
##
##                           SMD            95%-CI     t p-value
## Random effects model -0.0169 [-0.4166; 0.3829] -0.09  0.9322
## Prediction interval          [-1.7588; 1.7250]
##
## Quantifying heterogeneity:
##  tau^2 = 0.6959 [0.7202; 4.3553]; tau = 0.8342 [0.8486; 2.0869];
##  I^2 = 95.3% [94.2%; 96.1%]; H = 4.60 [4.16; 5.08]
```

```
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  739.53   35 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

Fiorino and Ricciuti (2007)	0.41	0.0490	3.6%	0.41 [0.31; 0.51]
Fiorino and Ricciuti (2007)	0.37	0.0640	3.6%	0.37 [0.25; 0.50]
Fiorino and Ricciuti (2007)	0.24	0.3360	3.1%	0.24 [−0.42; 0.89]
Fiorino and Ricciuti (2007)	0.23	0.0370	3.6%	0.23 [0.16; 0.30]
Fiorino and Ricciuti (2007)	0.23	0.0530	3.6%	0.23 [0.12; 0.33]
Kessler (2014)	0.22	0.0520	3.6%	0.22 [0.12; 0.32]
Kessler (2014)	0.22	0.0610	3.6%	0.22 [0.10; 0.33]
Fiorino and Ricciuti (2007)	0.21	0.0180	3.6%	0.21 [0.18; 0.25]
Fiorino and Ricciuti (2007)	0.21	0.3170	3.1%	0.21 [−0.41; 0.83]
Fiorino and Ricciuti (2007)	0.18	0.3050	3.2%	0.18 [−0.41; 0.78]
Kessler (2014)	0.17	0.0850	3.6%	0.17 [0.01; 0.34]
Kessler (2014)	0.16	0.0540	3.6%	0.16 [0.05; 0.26]
Lee (2016)	0.02	1.3130	1.0%	0.02 [−2.56; 2.59]
Schaltegger and Feld (2009)	0.00	0.0010	3.6%	0.00 [0.00; 0.00]
Schaltegger and Feld (2009)	−0.00	0.0010	3.6%	−0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0100	3.6%	−0.00 [−0.02; 0.02]
Bjedov et al. (2014)	−0.01	0.0100	3.6%	−0.01 [−0.03; 0.01]
Crowley (2019)	−0.35	0.7450	2.0%	−0.35 [−1.81; 1.11]
Primo (2006)	−0.82	0.1900	3.4%	−0.82 [−1.19; −0.45]
Lee and Park (2018)	−0.85	1.3950	0.9%	−0.85 [−3.59; 1.88]
Fiorino and Ricciuti (2007)	0.41	0.0490	3.6%	0.41 [0.31; 0.51]
Fiorino and Ricciuti (2007)	0.37	0.0640	3.6%	0.37 [0.25; 0.50]
Fiorino and Ricciuti (2007)	0.24	0.3360	3.1%	0.24 [−0.42; 0.89]
Fiorino and Ricciuti (2007)	0.23	0.0370	3.6%	0.23 [0.16; 0.30]
Fiorino and Ricciuti (2007)	0.23	0.0530	3.6%	0.23 [0.12; 0.33]
Kessler (2014)	0.22	0.0520	3.6%	0.22 [0.12; 0.32]
Kessler (2014)	0.22	0.0610	3.6%	0.22 [0.10; 0.33]
Fiorino and Ricciuti (2007)	0.21	0.0180	3.6%	0.21 [0.18; 0.25]
Fiorino and Ricciuti (2007)	0.21	0.3170	3.1%	0.21 [−0.41; 0.83]
Fiorino and Ricciuti (2007)	0.18	0.3050	3.2%	0.18 [−0.41; 0.78]
Kessler (2014)	0.17	0.0850	3.6%	0.17 [0.01; 0.34]
Kessler (2014)	0.16	0.0540	3.6%	0.16 [0.05; 0.26]
Lee (2016)	0.02	1.3130	1.0%	0.02 [−2.56; 2.59]
Schaltegger and Feld (2009)	0.00	0.0010	3.6%	0.00 [0.00; 0.00]
Schaltegger and Feld (2009)	−0.00	0.0010	3.6%	−0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0100	3.6%	−0.00 [−0.02; 0.02]
Bjedov et al. (2014)	−0.01	0.0100	3.6%	−0.01 [−0.03; 0.01]
Crowley (2019)	−0.35	0.7450	2.0%	−0.35 [−1.81; 1.11]
Primo (2006)	−0.82	0.1900	3.4%	−0.82 [−1.19; −0.45]
Lee and Park (2018)	−0.85	1.3950	0.9%	−0.85 [−3.59; 1.88]



Highlights:

1. The results are highly heterogeneous: $I^2 = $ 95.27.
2. The Random effects modem SMD estimated is $g = $ -0.02 ($SE = 0.197$).
3. The prediction interval ranges from -1.76 to 1.73. Therefore, it emcompasses zero.

Electoral system subgroup analysis The law of 1/n was created for majoritarian systems. In the theoretical section below, we explain why the argument have potential issues when applied to non-majoritarian electoral systems. We estimated a subgroup analysis using a binary electoral system.

```
## Warning in rma.uni(yi = TE[sel], sei = seTE[sel], method = method.tau, control
## = control): Ratio of largest to smallest sampling variance extremely large. May
## not be able to obtain stable results.
```

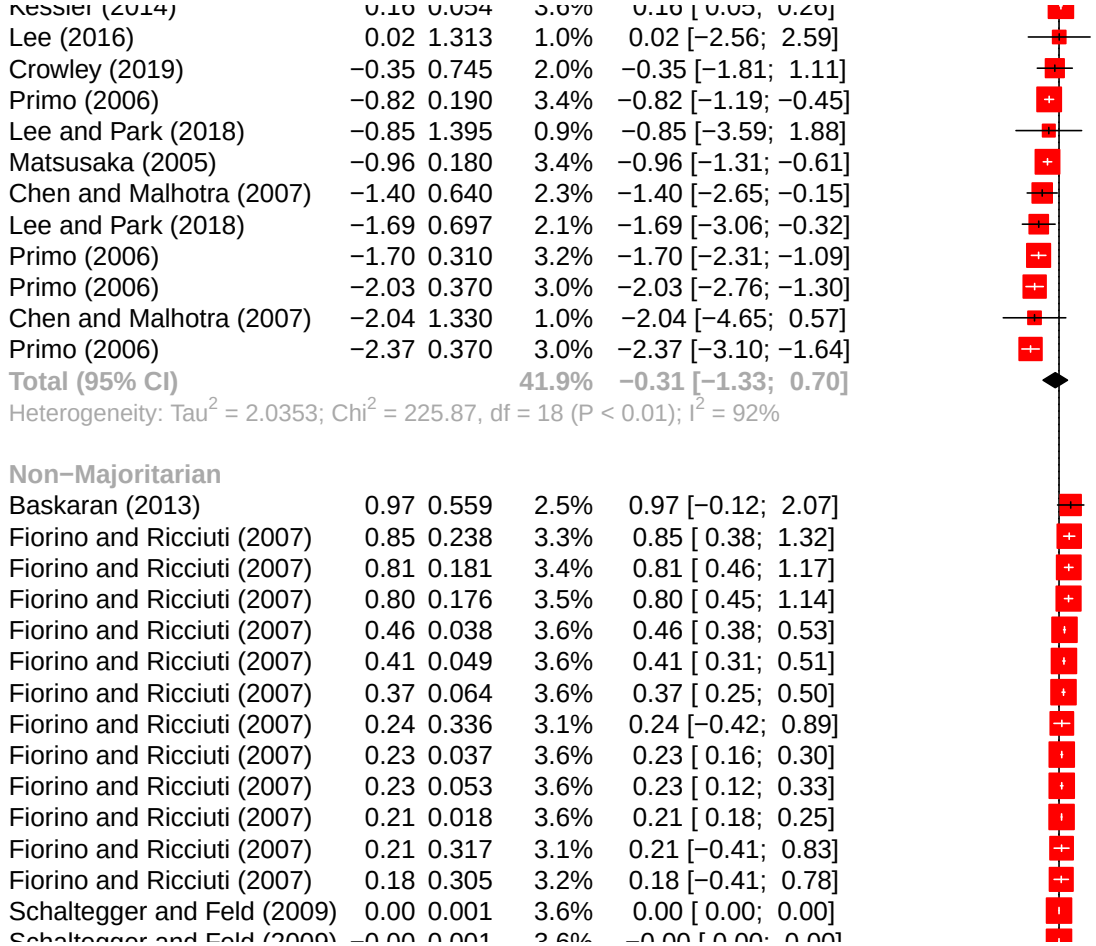


Figure 11: Subgroup Analysis of (N) x (ExpPC), controlling by electoral system

Therefore, we can see that the hypothesis that majoritarian systems produce systematic positive effects was disproved. The majoritarian systems in the sample had a random effects model estimate of -0.25, while the random effects model in the non-majoritarian subgroup fitted a value of 0.08. Both are non-significant, but they reassure us that the absense of effect is not caused by pooling multiple types of electoral systems.

PCTGDP x N

This model fits the random effects for the percentage of GDP as public expenditure as the main outcome, and the size of lower house as the main treatment variable.

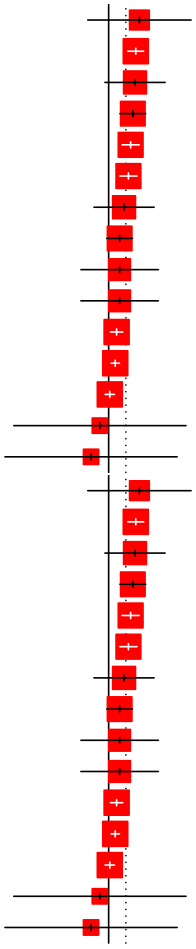
```
# Pooling effects analysis -- PCTGDP x N
aux <- fulldat %>%
  filter(indepvar2 == 'N',
         depvar2 == 'PCTGDP')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                               SMD             95%-CI %W(random)
## Bjedov et al. (2014)      -0.0040 [-0.0432;  0.0352]        2.1
## Bjedov et al. (2014)      -0.0080 [-0.0472;  0.0312]        2.1
## Maldonado (2013)          -0.0609 [-0.0838; -0.0380]        3.6
## Mukherjee (2003)           0.0030 [ 0.0010;  0.0050]        5.6
## Mukherjee (2003)           0.0090 [ 0.0051;  0.0129]        5.5
## Mukherjee (2003)           0.0110 [ 0.0051;  0.0169]        5.4
## Mukherjee (2003)           0.0050 [-0.0009;  0.0109]        5.4
## Mukherjee (2003)           0.0400 [ 0.0380;  0.0420]        5.6
## Mukherjee (2003)           0.0300 [ 0.0280;  0.0320]        5.6
## Mukherjee (2003)           0.0100 [ 0.0061;  0.0139]        5.5
## Mukherjee (2003)           0.0200 [ 0.0122;  0.0278]        5.3
## Bradbury and Crain (2001)  0.0036 [ 0.0008;  0.0065]        5.6
## Bradbury and Crain (2001)  0.0005 [-0.0016;  0.0027]        5.6
## Bradbury and Crain (2001)  0.0169 [ 0.0131;  0.0208]        5.6
## Bradbury and Crain (2001)  0.0123 [ 0.0087;  0.0160]        5.6
## Ricciuti (2004)            0.0140 [-0.0095;  0.0375]        3.5
## Ricciuti (2004)           -0.0110 [-0.0286;  0.0066]        4.2
## Ricciuti (2004)            0.0070 [-0.0067;  0.0207]        4.7
## Ricciuti (2004)            0.0050 [-0.0126;  0.0226]        4.2
## Ricciuti (2004)            0.0050 [-0.0126;  0.0226]        4.2
## Ricciuti (2004)            0.0120 [-0.0017;  0.0257]        4.7
##
## Number of studies combined: k = 21
##
##                         SMD            95%-CI    t p-value
## Random effects model 0.0078 [-0.0003; 0.0160] 2.01  0.0579
## Prediction interval         [-0.0259; 0.0416]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0002 [0.0002; 0.0007]; tau = 0.0156 [0.0136; 0.0261];
##  I^2 = 98.5% [98.2%; 98.7%]; H = 8.11 [7.40; 8.88]
##
## Test of heterogeneity:
##        Q d.f.  p-value
```

```
##  1314.54   20 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

Ricciuti (2004)	0.01	0.0120	3.5%	0.01 [−0.01; 0.04]
Bradbury and Crain (2001)	0.01	0.0019	5.6%	0.01 [0.01; 0.02]
Ricciuti (2004)	0.01	0.0070	4.7%	0.01 [0.00; 0.03]
Mukherjee (2003)	0.01	0.0030	5.4%	0.01 [0.01; 0.02]
Mukherjee (2003)	0.01	0.0020	5.5%	0.01 [0.01; 0.01]
Mukherjee (2003)	0.01	0.0020	5.5%	0.01 [0.01; 0.01]
Ricciuti (2004)	0.01	0.0070	4.7%	0.01 [−0.01; 0.02]
Mukherjee (2003)	0.00	0.0030	5.4%	0.00 [0.00; 0.01]
Ricciuti (2004)	0.00	0.0090	4.2%	0.00 [−0.01; 0.02]
Ricciuti (2004)	0.00	0.0090	4.2%	0.00 [−0.01; 0.02]
Bradbury and Crain (2001)	0.00	0.0014	5.6%	0.00 [0.00; 0.01]
Mukherjee (2003)	0.00	0.0010	5.6%	0.00 [0.00; 0.00]
Bradbury and Crain (2001)	0.00	0.0011	5.6%	0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0200	2.1%	−0.00 [−0.04; 0.04]
Bjedov et al. (2014)	−0.01	0.0200	2.1%	−0.01 [−0.05; 0.03]
Ricciuti (2004)	0.01	0.0120	3.5%	0.01 [−0.01; 0.04]
Bradbury and Crain (2001)	0.01	0.0019	5.6%	0.01 [0.01; 0.02]
Ricciuti (2004)	0.01	0.0070	4.7%	0.01 [0.00; 0.03]
Mukherjee (2003)	0.01	0.0030	5.4%	0.01 [0.01; 0.02]
Mukherjee (2003)	0.01	0.0020	5.5%	0.01 [0.01; 0.01]
Mukherjee (2003)	0.01	0.0020	5.5%	0.01 [0.01; 0.01]
Ricciuti (2004)	0.01	0.0070	4.7%	0.01 [−0.01; 0.02]
Mukherjee (2003)	0.00	0.0030	5.4%	0.00 [0.00; 0.01]
Ricciuti (2004)	0.00	0.0090	4.2%	0.00 [−0.01; 0.02]
Ricciuti (2004)	0.00	0.0090	4.2%	0.00 [−0.01; 0.02]
Bradbury and Crain (2001)	0.00	0.0014	5.6%	0.00 [0.00; 0.01]
Mukherjee (2003)	0.00	0.0010	5.6%	0.00 [0.00; 0.00]
Bradbury and Crain (2001)	0.00	0.0011	5.6%	0.00 [0.00; 0.00]
Bjedov et al. (2014)	−0.00	0.0200	2.1%	−0.00 [−0.04; 0.04]
Bjedov et al. (2014)	−0.01	0.0200	2.1%	−0.01 [−0.05; 0.03]



Highlights:

1. The results are highly heterogeneous: $I^2 = $ 98.48.
2. The Random effects modem SMD estimated is $g = $ 0.01 ($SE = 0.004$).
3. The prediction interval ranges from -0.03 to 0.04. Therefore, it emcompasses zero.

logExpPC x N

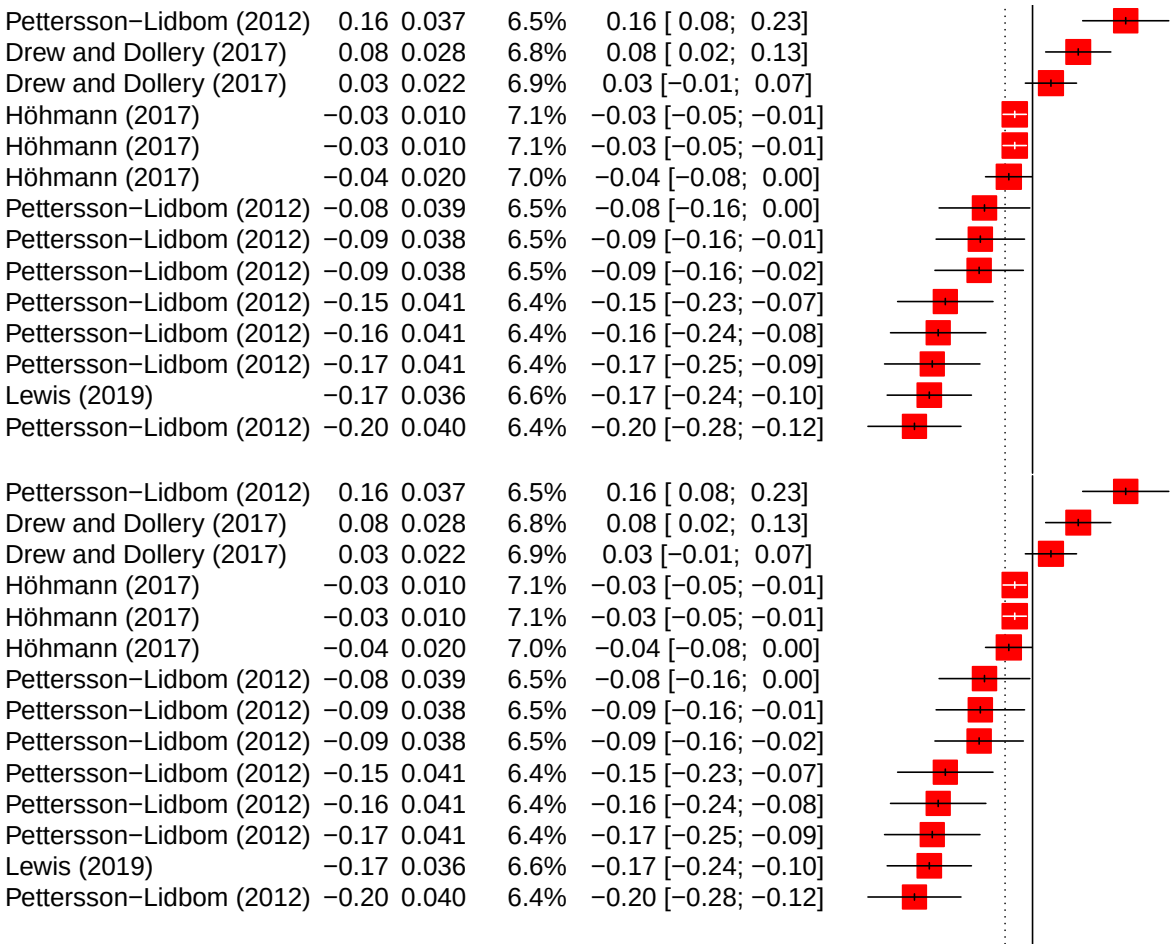
This model estimates the Log of Per Capita Expenditure as the dependent variable, and the number of lower house legislators as the treatment variable.

```
# Pooling effects analysis -- logExpPC x N
aux <- fulldat %>%
  filter(indepvar2 == 'N',
         depvar2 == 'logExpPC')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                              SMD             95%-CI %W(random)
## Lewis (2019)             -0.1740 [-0.2450; -0.1030]        6.6
## Höhmann (2017)           -0.0300 [-0.0496; -0.0104]        7.1
## Höhmann (2017)           -0.0300 [-0.0496; -0.0104]        7.1
## Höhmann (2017)           -0.0400 [-0.0792; -0.0008]        7.0
## Drew and Dollery (2017)   0.0770 [ 0.0221;  0.1319]        6.8
## Drew and Dollery (2017)   0.0310 [-0.0121;  0.0741]        6.9
## Pettersson-Lidbom (2012) -0.1590 [-0.2394; -0.0786]        6.4
## Pettersson-Lidbom (2012) -0.1470 [-0.2274; -0.0666]        6.4
## Pettersson-Lidbom (2012) -0.0900 [-0.1645; -0.0155]        6.5
## Pettersson-Lidbom (2012) -0.0810 [-0.1574; -0.0046]        6.5
## Pettersson-Lidbom (2012) -0.0880 [-0.1625; -0.0135]        6.5
## Pettersson-Lidbom (2012)  0.2100 [ 0.1649;  0.2551]        6.9
## Pettersson-Lidbom (2012)  0.1570 [ 0.0845;  0.2295]        6.5
## Pettersson-Lidbom (2012) -0.1990 [-0.2774; -0.1206]        6.4
## Pettersson-Lidbom (2012) -0.1690 [-0.2494; -0.0886]        6.4
##
## Number of studies combined: k = 15
##
##                          SMD            95%-CI     t p-value
## Random effects model -0.0463 [-0.1142; 0.0216] -1.46  0.1655
## Prediction interval          [-0.3105; 0.2178]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0139 [0.0070; 0.0364]; tau = 0.1181 [0.0836; 0.1908];
##  I^2 = 93.8% [91.2%; 95.6%]; H = 4.00 [3.38; 4.75]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  224.56   14 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
```

```
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:



Highlights:

1. The results are highly heterogeneous: $I^2 = $ 93.77.
2. The Random effects modem SMD estimated is $g = $ -0.05 ($SE = 0.032$).
3. The prediction interval ranges from -0.31 to 0.22. Therefore, it emcompasses zero.

ExpPC x logN

There were no studies that had per capita expenditure in the dependent variable and log of lower house size in the treatment variable.

PCTGDP x logN

This meta-regression investigates the percentage of GDP as public expenditure as the dependent variable and the log lower house size (logN) as the treatment variable.

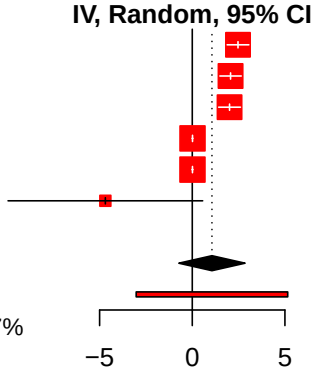
```
# Pooling effects analysis -- PCTGDP x logN
aux <- fulldat %>%
  filter(indepvar2 == 'logN',
         depvar2 == 'PCTGDP')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                          SMD            95%-CI %W(random)
## Baqir (1999)          2.0660 [ 1.4887; 2.6433]       18.9
## Baqir (1999)          2.0120 [ 1.4235; 2.6005]       18.8
## Baqir (1999)          2.4680 [ 1.8817; 3.0543]       18.8
## Lledo (2003)         -4.6900 [-9.9427; 0.5627]        3.8
## Stein et al. (1998)   0.0109 [-0.0171; 0.0389]       19.8
## Stein et al. (1998)   0.0135 [-0.0102; 0.0372]       19.8
##
## Number of studies combined: k = 6
##
##                          SMD            95%-CI    t p-value
## Random effects model 1.0619 [-0.7256; 2.8493] 1.53  0.1873
## Prediction interval         [-3.0267; 5.1504]
##
## Quantifying heterogeneity:
##  tau^2 = 1.6850 [0.6497; 38.1618]; tau = 1.2981 [0.8060; 6.1775];
##  I^2 = 96.9% [95.2%; 98.1%]; H = 5.71 [4.55; 7.16]
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  163.00    5 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

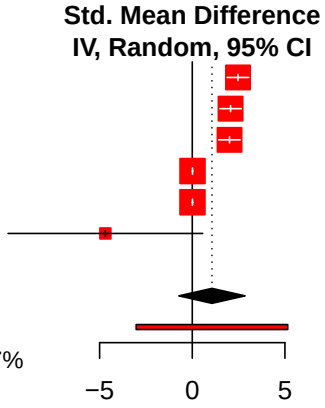
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (1999)	2.47	0.299	18.8%	2.47 [1.88; 3.05]
Baqir (1999)	2.07	0.295	18.9%	2.07 [1.49; 2.64]
Baqir (1999)	2.01	0.300	18.8%	2.01 [1.42; 2.60]
Stein et al. (1998)	0.01	0.012	19.8%	0.01 [−0.01; 0.04]
Stein et al. (1998)	0.01	0.014	19.8%	0.01 [−0.02; 0.04]
Lledo (2003)	−4.69	2.680	3.8%	−4.69 [−9.94; 0.56]
Total (95% CI)			**100.0%**	**1.06 [−0.73; 2.85]**
Prediction interval				**[−3.03; 5.15]**

Heterogeneity: Tau^2 = 1.6850; Chi^2 = 163.00, df = 5 (P < 0.01); I^2 = 97%



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (1999)	2.47	0.299	18.8%	2.47 [1.88; 3.05]
Baqir (1999)	2.07	0.295	18.9%	2.07 [1.49; 2.64]
Baqir (1999)	2.01	0.300	18.8%	2.01 [1.42; 2.60]
Stein et al. (1998)	0.01	0.012	19.8%	0.01 [−0.01; 0.04]
Stein et al. (1998)	0.01	0.014	19.8%	0.01 [−0.02; 0.04]
Lledo (2003)	−4.69	2.680	3.8%	−4.69 [−9.94; 0.56]
Total (95% CI)			**100.0%**	**1.06 [−0.73; 2.85]**
Prediction interval				**[−3.03; 5.15]**

Heterogeneity: Tau^2 = 1.6850; Chi^2 = 163.00, df = 5 (P < 0.01); I^2 = 97%



Highlights:

1. The results are highly heterogeneous: $I^2 = 96.93.
2. The Random effects modem SMD estimated is $g = 1.06 ($SE = 0.695$).
3. The prediction interval ranges from -3.03 to 5.15. Therefore, it emcompasses zero.

logExpPC x logN

In this specification, we study the log of per capita expenditure (logExpPC) as a function of the log of lower house size (logN).

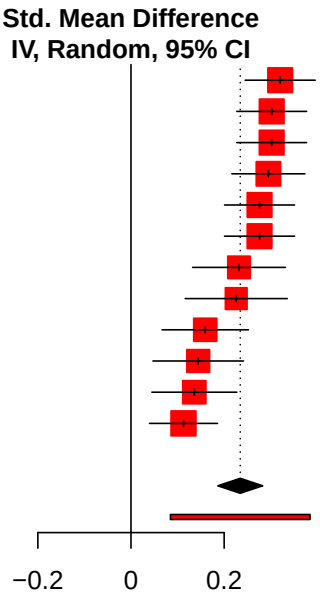
```
# Pooling effects analysis -- logExpPC x logN
aux <- fulldat %>%
  filter(indepvar2 == 'logN',
         depvar2 == 'logExpPC')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                      SMD           95%-CI %W(random)
## MacDonald (2008) 0.1360 [0.0447; 0.2273]        7.9
## MacDonald (2008) 0.2319 [0.1322; 0.3316]        7.4
## MacDonald (2008) 0.1443 [0.0471; 0.2415]        7.6
## MacDonald (2008) 0.1594 [0.0667; 0.2521]        7.8
## MacDonald (2008) 0.2259 [0.1163; 0.3355]        6.9
## Baqir (2002)     0.1127 [0.0396; 0.1858]        9.1
## Baqir (2002)     0.2760 [0.2007; 0.3513]        8.9
## Baqir (2002)     0.3021 [0.2270; 0.3772]        8.9
## Baqir (2002)     0.3203 [0.2450; 0.3956]        8.9
## Baqir (1999)     0.3020 [0.2269; 0.3771]        8.9
## Baqir (1999)     0.2760 [0.2007; 0.3513]        8.9
## Baqir (1999)     0.2950 [0.2165; 0.3735]        8.7
##
## Number of studies combined: k = 12
##
##                         SMD           95%-CI     t  p-value
## Random effects model 0.2346 [0.1864; 0.2828] 10.71 < 0.0001
## Prediction interval         [0.0848; 0.3844]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0040 [0.0011; 0.0145]; tau = 0.0636 [0.0335; 0.1203];
##  I^2 = 70.0% [45.6%; 83.4%]; H = 1.82 [1.36; 2.45]
##
## Test of heterogeneity:
##      Q d.f. p-value
##  36.62   11  0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

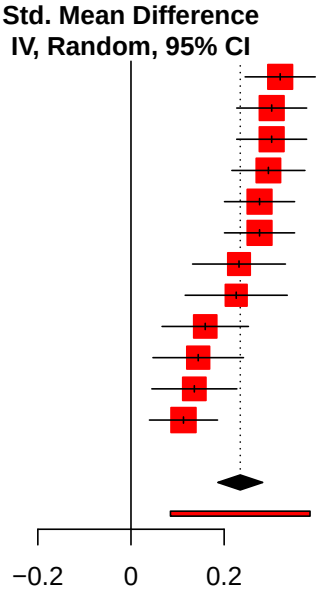
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (2002)	0.32	0.038	8.9%	0.32 [0.25; 0.40]
Baqir (2002)	0.30	0.038	8.9%	0.30 [0.23; 0.38]
Baqir (1999)	0.30	0.038	8.9%	0.30 [0.23; 0.38]
Baqir (1999)	0.30	0.040	8.7%	0.30 [0.22; 0.37]
Baqir (2002)	0.28	0.038	8.9%	0.28 [0.20; 0.35]
Baqir (1999)	0.28	0.038	8.9%	0.28 [0.20; 0.35]
MacDonald (2008)	0.23	0.051	7.4%	0.23 [0.13; 0.33]
MacDonald (2008)	0.23	0.056	6.9%	0.23 [0.12; 0.34]
MacDonald (2008)	0.16	0.047	7.8%	0.16 [0.07; 0.25]
MacDonald (2008)	0.14	0.050	7.6%	0.14 [0.05; 0.24]
MacDonald (2008)	0.14	0.047	7.9%	0.14 [0.04; 0.23]
Baqir (2002)	0.11	0.037	9.1%	0.11 [0.04; 0.19]
Total (95% CI)			**100.0%**	**0.23 [0.19; 0.28]**
Prediction interval				**[0.08; 0.38]**

Heterogeneity: $Tau^2 = 0.0040$; $Chi^2 = 36.62$, df = 11 ($P < 0.01$); $I^2 = 70\%$



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Baqir (2002)	0.32	0.038	8.9%	0.32 [0.25; 0.40]
Baqir (2002)	0.30	0.038	8.9%	0.30 [0.23; 0.38]
Baqir (1999)	0.30	0.038	8.9%	0.30 [0.23; 0.38]
Baqir (1999)	0.30	0.040	8.7%	0.30 [0.22; 0.37]
Baqir (2002)	0.28	0.038	8.9%	0.28 [0.20; 0.35]
Baqir (1999)	0.28	0.038	8.9%	0.28 [0.20; 0.35]
MacDonald (2008)	0.23	0.051	7.4%	0.23 [0.13; 0.33]
MacDonald (2008)	0.23	0.056	6.9%	0.23 [0.12; 0.34]
MacDonald (2008)	0.16	0.047	7.8%	0.16 [0.07; 0.25]
MacDonald (2008)	0.14	0.050	7.6%	0.14 [0.05; 0.24]
MacDonald (2008)	0.14	0.047	7.9%	0.14 [0.04; 0.23]
Baqir (2002)	0.11	0.037	9.1%	0.11 [0.04; 0.19]
Total (95% CI)			**100.0%**	**0.23 [0.19; 0.28]**
Prediction interval				**[0.08; 0.38]**

Heterogeneity: $Tau^2 = 0.0040$; $Chi^2 = 36.62$, df = 11 ($P < 0.01$); $I^2 = 70\%$



Highlights:

1. The results are highly heterogeneous: $I^2 = 69.96\%$.
2. The Random effects modem SMD estimated is $g = 0.23$ ($SE = 0.022$). **This model is significant at the 10% confidence level.**
3. The prediction interval ranges from 0.08 to 0.38. Therefore, it does not emcompasses zero.

ExpPC x K

Now we are investigating the upper house size (K). In this model, we investigate the effect of upper house size on expenditure per capita (ExpPC).

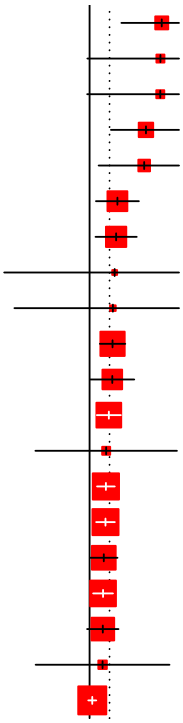
```
# Pooling effects analysis -- ExpPC x K
aux <- fulldat %>%
  filter(indepvar2 == 'K',
         depvar2 == 'ExpPC')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                                    SMD              95%-CI %W(random)
## Crowley (2019)                  8.2100 [  0.2702; 16.1498]        4.8
## Crowley (2019)                  8.4230 [-27.1895; 44.0355]        0.4
## Crowley (2019)                  9.5940 [  2.1383; 17.0497]        5.1
## Lee and Park (2018)            19.7400 [  3.2645; 36.2155]        1.7
## Lee and Park (2018)            10.0600 [  2.2887; 17.8313]        4.9
## Lee and Park (2018)             9.0620 [-30.8821; 49.0061]        0.3
## Lee (2016)                     38.4400 [  0.7499; 76.1301]        0.4
## Lee (2016)                     37.8500 [  3.0214; 72.6786]        0.4
## Lee (2016)                     25.6100 [ -0.8103; 52.0303]        0.8
## Lee (2016)                      5.9960 [-19.6011; 31.5931]        0.8
## Lee (2016)                     25.5600 [ -0.8799; 51.9999]        0.8
## Lee (2016)                      4.6930 [-19.5126; 28.8986]        0.9
## Bradbury and Stephenson (2009)  0.6240 [  0.2295;  1.0185]       10.0
## Chen and Malhotra (2007)       26.0900 [ 11.4883; 40.6917]        2.1
## Chen and Malhotra (2007)        8.3000 [  3.6941; 12.9059]        7.3
## Chen and Malhotra (2007)        5.1400 [  0.1813; 10.0987]        7.0
## Chen and Malhotra (2007)        4.7800 [ -0.9039; 10.4639]        6.4
## Chen and Malhotra (2007)       20.3800 [  7.6990; 33.0610]        2.6
## Chen and Malhotra (2007)        4.8700 [  1.2833;  8.4567]        8.2
## Chen and Malhotra (2007)       26.7500 [  0.8589; 52.6411]        0.8
## Primo (2006)                    0.9700 [ -0.4804;  2.4204]        9.7
## Primo (2006)                    5.9000 [  2.6857;  9.1143]        8.5
## Primo (2006)                    5.7500 [  2.3593;  9.1407]        8.4
## Primo (2006)                    6.9600 [  2.6089; 11.3111]        7.6
##
## Number of studies combined: k = 24
##
##                          SMD             95%-CI    t  p-value
## Random effects model 7.2162 [ 4.4400;  9.9925] 5.38 < 0.0001
## Prediction interval         [-1.2217; 15.6542]
##
## Quantifying heterogeneity:
##  tau^2 = 14.7532 [5.4141; 111.2304]; tau = 3.8410 [2.3268; 10.5466];
##  I^2 = 77.7% [67.3%; 84.8%]; H = 2.12 [1.75; 2.57]
```

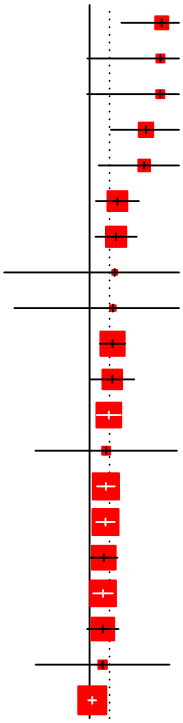
```
##
## Test of heterogeneity:
##       Q d.f.  p-value
##  103.34   23 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

l Malhotra (2007)	26.09	7.450	2.1%	26.09 [11.49; 40.69]
6)	25.61	13.480	0.8%	25.61 [−0.81; 52.03]
6)	25.56	13.490	0.8%	25.56 [−0.88; 52.00]
l Malhotra (2007)	20.38	6.470	2.6%	20.38 [7.70; 33.06]
ark (2018)	19.74	8.406	1.7%	19.74 [3.26; 36.22]
ark (2018)	10.06	3.965	4.9%	10.06 [2.29; 17.83]
2019)	9.59	3.804	5.1%	9.59 [2.14; 17.05]
ark (2018)	9.06	20.380	0.3%	9.06 [−30.88; 49.01]
2019)	8.42	18.170	0.4%	8.42 [−27.19; 44.04]
l Malhotra (2007)	8.30	2.350	7.3%	8.30 [3.69; 12.91]
2019)	8.21	4.051	4.8%	8.21 [0.27; 16.15]
06)	6.96	2.220	7.6%	6.96 [2.61; 11.31]
6)	6.00	13.060	0.8%	6.00 [−19.60; 31.59]
06)	5.90	1.640	8.5%	5.90 [2.69; 9.11]
06)	5.75	1.730	8.4%	5.75 [2.36; 9.14]
l Malhotra (2007)	5.14	2.530	7.0%	5.14 [0.18; 10.10]
l Malhotra (2007)	4.87	1.830	8.2%	4.87 [1.28; 8.46]
l Malhotra (2007)	4.78	2.900	6.4%	4.78 [−0.90; 10.46]
6)	4.69	12.350	0.9%	4.69 [−19.51; 28.90]
06)	0.97	0.740	9.7%	0.97 [−0.48; 2.42]



l Malhotra (2007)	26.09	7.450	2.1%	26.09 [11.49; 40.69]
6)	25.61	13.480	0.8%	25.61 [−0.81; 52.03]
6)	25.56	13.490	0.8%	25.56 [−0.88; 52.00]
l Malhotra (2007)	20.38	6.470	2.6%	20.38 [7.70; 33.06]
Park (2018)	19.74	8.406	1.7%	19.74 [3.26; 36.22]
Park (2018)	10.06	3.965	4.9%	10.06 [2.29; 17.83]
2019)	9.59	3.804	5.1%	9.59 [2.14; 17.05]
Park (2018)	9.06	20.380	0.3%	9.06 [−30.88; 49.01]
2019)	8.42	18.170	0.4%	8.42 [−27.19; 44.04]
l Malhotra (2007)	8.30	2.350	7.3%	8.30 [3.69; 12.91]
2019)	8.21	4.051	4.8%	8.21 [0.27; 16.15]
06)	6.96	2.220	7.6%	6.96 [2.61; 11.31]
6)	6.00	13.060	0.8%	6.00 [−19.60; 31.59]
06)	5.90	1.640	8.5%	5.90 [2.69; 9.11]
06)	5.75	1.730	8.4%	5.75 [2.36; 9.14]
l Malhotra (2007)	5.14	2.530	7.0%	5.14 [0.18; 10.10]
l Malhotra (2007)	4.87	1.830	8.2%	4.87 [1.28; 8.46]
l Malhotra (2007)	4.78	2.900	6.4%	4.78 [−0.90; 10.46]
6)	4.69	12.350	0.9%	4.69 [−19.51; 28.90]
06)	0.97	0.740	9.7%	0.97 [−0.48; 2.42]



Highlights:

1. The results are highly heterogeneous: $I^2 = $ 77.74.
2. The Random effects modem SMD estimated is $g = $ 7.22 ($SE = 1.342$).
3. The prediction interval ranges from -1.22 to 15.65. Therefore, it emcompasses zero.

PCTGDP x K

This model looks into the effect of upper house size (K) on the public expenditure share of the GDP (PCTGDP).

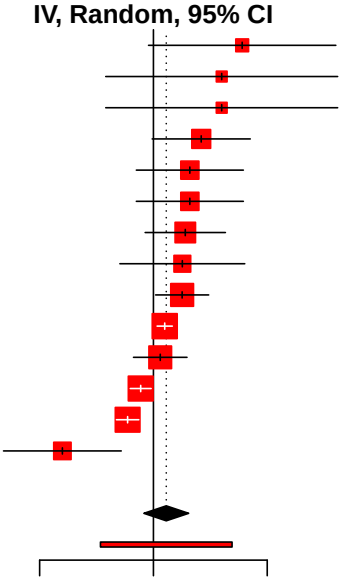
```
# Pooling effects analysis -- PCTGDP x K
aux <- fulldat %>%
  filter(indepvar2 == 'K',
         depvar2 == 'PCTGDP')

mod <- metagen(coef, SE, data=aux,
          studlab=paste(authoryear),
          comb.fixed = FALSE,
          comb.random = TRUE,
          method.tau = "REML",
          hakn = TRUE,
          prediction=TRUE,
          sm="SMD")
mod
```

```
##                               SMD             95%-CI %W(random)
## Maldonado (2012)          -0.0400 [-0.0659; -0.0141]        5.7
## Bradbury and Crain (2001)  0.0126 [ 0.0010;  0.0243]        9.8
## Bradbury and Crain (2001)  0.0050 [ 0.0016;  0.0083]       11.8
## Bradbury and Crain (2001) -0.0113 [-0.0163; -0.0064]       11.5
## Bradbury and Crain (2001) -0.0056 [-0.0102; -0.0010]       11.6
## Ricciuti (2004)            0.0160 [-0.0075;  0.0395]        6.2
## Ricciuti (2004)            0.0210 [-0.0006;  0.0426]        6.7
## Ricciuti (2004)            0.0140 [-0.0036;  0.0316]        7.9
## Ricciuti (2004)            0.0030 [-0.0088;  0.0148]        9.7
## Ricciuti (2004)            0.0300 [-0.0210;  0.0810]        2.2
## Ricciuti (2004)            0.0300 [-0.0210;  0.0810]        2.2
## Ricciuti (2004)            0.0390 [-0.0022;  0.0802]        3.1
## Ricciuti (2004)            0.0127 [-0.0147;  0.0401]        5.3
## Ricciuti (2004)            0.0160 [-0.0075;  0.0395]        6.2
##
## Number of studies combined: k = 14
##
##                         SMD            95%-CI    t p-value
## Random effects model 0.0056 [-0.0042; 0.0155] 1.24  0.2376
## Prediction interval         [-0.0233; 0.0346]
##
## Quantifying heterogeneity:
##  tau^2 = 0.0002 [0.0001; 0.0008]; tau = 0.0125 [0.0109; 0.0279];
##  I^2 = 80.0% [67.3%; 87.8%]; H = 2.24 [1.75; 2.86]
##
## Test of heterogeneity:
##      Q d.f.  p-value
##  65.02   13 < 0.0001
##
## Details on meta-analytical method:
## - Inverse variance method
## - Restricted maximum-likelihood estimator for tau^2
## - Q-profile method for confidence interval of tau^2 and tau
## - Hartung-Knapp adjustment for random effects model
```

And the forest plot:

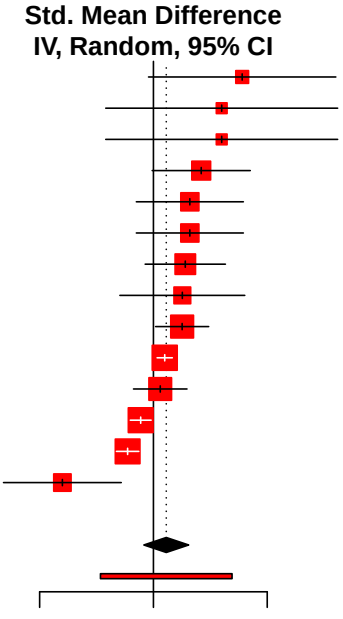
Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Ricciuti (2004)	0.04	0.021	3.1%	0.04 [0.00; 0.08]
Ricciuti (2004)	0.03	0.026	2.2%	0.03 [−0.02; 0.08]
Ricciuti (2004)	0.03	0.026	2.2%	0.03 [−0.02; 0.08]
Ricciuti (2004)	0.02	0.011	6.7%	0.02 [0.00; 0.04]
Ricciuti (2004)	0.02	0.012	6.2%	0.02 [−0.01; 0.04]
Ricciuti (2004)	0.02	0.012	6.2%	0.02 [−0.01; 0.04]
Ricciuti (2004)	0.01	0.009	7.9%	0.01 [0.00; 0.03]
Ricciuti (2004)	0.01	0.014	5.3%	0.01 [−0.01; 0.04]
Bradbury and Crain (2001)	0.01	0.006	9.8%	0.01 [0.00; 0.02]
Bradbury and Crain (2001)	0.00	0.002	11.8%	0.00 [0.00; 0.01]
Ricciuti (2004)	0.00	0.006	9.7%	0.00 [−0.01; 0.01]
Bradbury and Crain (2001)	−0.01	0.002	11.6%	−0.01 [−0.01; 0.00]
Bradbury and Crain (2001)	−0.01	0.003	11.5%	−0.01 [−0.02; −0.01]
Maldonado (2012)	−0.04	0.013	5.7%	−0.04 [−0.07; −0.01]
Total (95% CI)			**100.0%**	**0.01 [0.00; 0.02]**
Prediction interval				**[−0.02; 0.03]**

Heterogeneity: $Tau^2 = 0.0002$; $Chi^2 = 65.02$, df = 13 ($P < 0.01$); $I^2 = 80\%$



Study	TE	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Ricciuti (2004)	0.04	0.021	3.1%	0.04 [0.00; 0.08]
Ricciuti (2004)	0.03	0.026	2.2%	0.03 [−0.02; 0.08]
Ricciuti (2004)	0.03	0.026	2.2%	0.03 [−0.02; 0.08]
Ricciuti (2004)	0.02	0.011	6.7%	0.02 [0.00; 0.04]
Ricciuti (2004)	0.02	0.012	6.2%	0.02 [−0.01; 0.04]
Ricciuti (2004)	0.02	0.012	6.2%	0.02 [−0.01; 0.04]
Ricciuti (2004)	0.01	0.009	7.9%	0.01 [0.00; 0.03]
Ricciuti (2004)	0.01	0.014	5.3%	0.01 [−0.01; 0.04]
Bradbury and Crain (2001)	0.01	0.006	9.8%	0.01 [0.00; 0.02]
Bradbury and Crain (2001)	0.00	0.002	11.8%	0.00 [0.00; 0.01]
Ricciuti (2004)	0.00	0.006	9.7%	0.00 [−0.01; 0.01]
Bradbury and Crain (2001)	−0.01	0.002	11.6%	−0.01 [−0.01; 0.00]
Bradbury and Crain (2001)	−0.01	0.003	11.5%	−0.01 [−0.02; −0.01]
Maldonado (2012)	−0.04	0.013	5.7%	−0.04 [−0.07; −0.01]
Total (95% CI)			**100.0%**	**0.01 [0.00; 0.02]**
Prediction interval				**[−0.02; 0.03]**

Heterogeneity: $Tau^2 = 0.0002$; $Chi^2 = 65.02$, df = 13 ($P < 0.01$); $I^2 = 80\%$



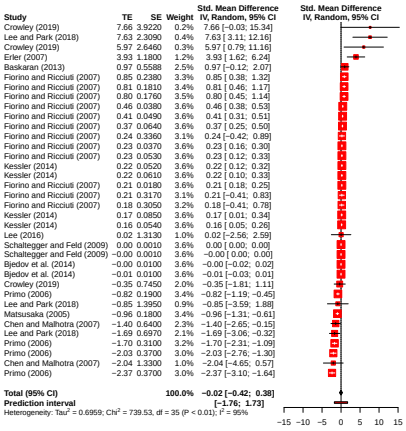
Highlights:

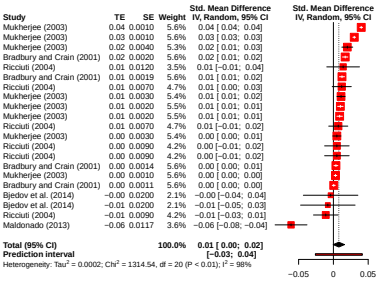
1. The results are highly heterogeneous: $I^2 = 80.01.
2. The Random effects modem SMD estimated is $g = $ 0.01 ($SE = 0.005$).
3. The prediction interval ranges from -0.02 to 0.03. Therefore, it emcompasses zero.

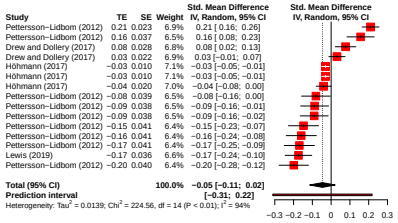
logExpPC x K

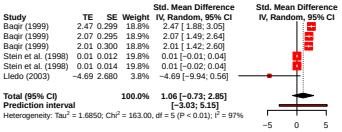
No studies related the log of per capita expenditure with the size of upper house (K).

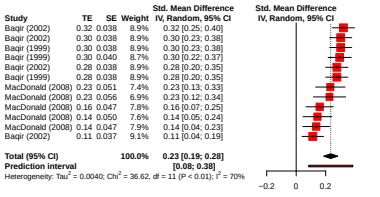
Summary of results

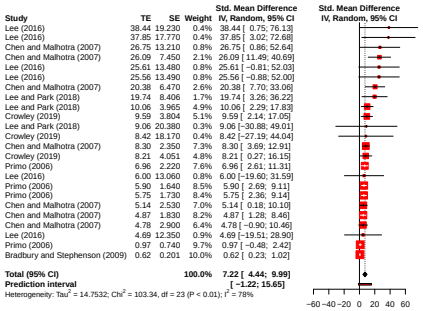












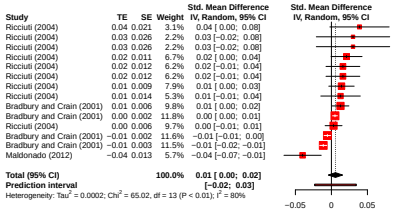


Figure 12: test size

Meta-regressions

Meta-regressions for Expenditure as a Percentage of the GDP

```
summary(mod)
```

```
##
## Mixed-Effects Model (k = 11; tau^2 estimator: REML)
##
##   logLik  deviance       AIC       BIC      AICc
##   7.0993  -14.1987    5.8013   -7.2672  225.8013
##
## tau^2 (estimated amount of residual heterogeneity):     0 (SE = 0.0001)
## tau (square root of estimated tau^2 value):             0
## I^2 (residual heterogeneity / unaccounted variability): 0.00%
## H^2 (unaccounted variability / sampling variability):   1.00
## R^2 (amount of heterogeneity accounted for):            100.00%
##
## Test for Residual Heterogeneity:
## QE(df = 2) = 0.5965, p-val = 0.7421
##
## Test of Moderators (coefficients 2:9):
## F(df1 = 8, df2 = 2) = 40.7363, p-val = 0.0242
##
## Model Results:
##
##                           estimate      se      tval    pval     ci.lb    ci.ub
## intrcpt                     7.3697  1.7616    4.1835  0.0527   -0.2099  14.9493
## indepvar2N                 -0.0094  0.0030   -3.1174  0.0893   -0.0223   0.0036
## indepvar2logN              -4.7067  1.4637   -3.2156  0.0846  -11.0045   1.5912
## year                       -0.0003  0.0005   -0.6899  0.5615   -0.0024   0.0017
## publishedNo                 0.0633  0.0078    8.1139  0.0149    0.0297   0.0969
## elecsys2Non-Majoritarian   -2.0554  0.1611  -12.7621  0.0061   -2.7484  -1.3625
## methodPANEL                 0.0556  0.0071    7.7913  0.0161    0.0249   0.0864
## agglevelStates             -4.6992  1.4637   -3.2106  0.0848  -10.9969   1.5984
## location2World             -4.6959  1.4637   -3.2082  0.0850  -10.9937   1.6019
##
## intrcpt                     .
## indepvar2N                  .
## indepvar2logN               .
## year
## publishedNo                 *
## elecsys2Non-Majoritarian   **
## methodPANEL                 *
## agglevelStates              .
## location2World              .
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

As we have considerable heterogeneity in our sample, we run a permutation test to ensure the validity of our estimates. The results follow below.

```
## Error in rma.uni(x$yi, x$vi, weights = x$weights, mods = cbind(X[sample(x$k),  :
##   Fisher scoring algorithm did not converge. See 'help(rma)' for possible remedies.
## Error in rma.uni(x$yi, x$vi, weights = x$weights, mods = cbind(X[sample(x$k),  :
```

```
##   Fisher scoring algorithm did not converge. See 'help(rma)' for possible remedies.
##
## Test of Moderators (coefficients 2:9):
## F(df1 = 8, df2 = 2) = 40.7363, p-val* = 0.0130
##
## Model Results:
##
##                            estimate      se      tval   pval*     ci.lb    ci.ub
## intrcpt                      7.3697  1.7616    4.1835  0.0360   -0.2099  14.9493
## indepvar2N                  -0.0094  0.0030   -3.1174  0.0190   -0.0223   0.0036
## indepvar2logN               -4.7067  1.4637   -3.2156  0.2010  -11.0045   1.5912
## year                        -0.0003  0.0005   -0.6899  0.4350   -0.0024   0.0017
## publishedNo                  0.0633  0.0078    8.1139  0.0140    0.0297   0.0969
## elecsys2Non-Majoritarian    -2.0554  0.1611  -12.7621  0.0090   -2.7484  -1.3625
## methodPANEL                  0.0556  0.0071    7.7913  0.0140    0.0249   0.0864
## agglevelStates              -4.6992  1.4637   -3.2106  0.2170  -10.9969   1.5984
## location2World              -4.6959  1.4637   -3.2082  0.2790  -10.9937   1.6019
##
## intrcpt                      *
## indepvar2N                   *
## indepvar2logN
## year
## publishedNo                  *
## elecsys2Non-Majoritarian    **
## methodPANEL                  *
## agglevelStates
## location2World
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We have the following results for the meta-regressions of Expenditure Per Capita:

1. Compared with `K`, models with `N` and `logN` find significantly negative coefficients.
2. Year has null effect.
3. Unpublished papers tend to have higher coefficients than published papers.
4. Passing from `Majoritarian` to `Non-Majoritarian`, decreases significantly the effects found in our models.
5. In terms of the modeling, passing from `OLS` to `PANEL` increases the detected effects.
6. When passing from `Local` to `State` or `World` levels, it decreases the detected effect size.

Below we also run the meta-regressions adding all coefficients in the papers. The results follow below:

```
summary(mod)
```

```
##
## Mixed-Effects Model (k = 41; tau^2 estimator: REML)
##
##    logLik   deviance        AIC        BIC       AICc
##   89.1145  -178.2290  -158.2290  -143.5716  -147.7528
##
## tau^2 (estimated amount of residual heterogeneity):     0.0001 (SE = 0.0000)
## tau (square root of estimated tau^2 value):             0.0102
## I^2 (residual heterogeneity / unaccounted variability): 94.05%
## H^2 (unaccounted variability / sampling variability):   16.81
## R^2 (amount of heterogeneity accounted for):            99.92%
```

```
##
## Test for Residual Heterogeneity:
## QE(df = 32) = 1001.8067, p-val < .0001
##
## Test of Moderators (coefficients 2:9):
## F(df1 = 8, df2 = 32) = 29.7201, p-val < .0001
##
## Model Results:
##
##                           estimate      se      tval    pval     ci.lb    ci.ub
## intrcpt                    -5.3830  5.8900   -0.9139  0.3676  -17.3805   6.6145
## indepvar2N                 -0.0014  0.0048   -0.2945  0.7703   -0.0112   0.0084
## indepvar2logN              -4.6069  2.4363   -1.8909  0.0677   -9.5696   0.3558
## year                        0.0060  0.0027    2.2730  0.0299    0.0006   0.0114
## publishedNo                 0.1130  0.0251    4.5060  <.0001    0.0619   0.1641
## elecsys2Non-Majoritarian   -2.1629  0.1568  -13.7904  <.0001   -2.4823  -1.8434
## methodPANEL                 0.1252  0.0304    4.1232  0.0002    0.0633   0.1870
## agglevelStates             -4.7325  2.4361   -1.9426  0.0609   -9.6947   0.2298
## location2World             -4.6443  2.4362   -1.9064  0.0656   -9.6067   0.3181
##
## intrcpt
## indepvar2N
## indepvar2logN               .
## year                        *
## publishedNo                 ***
## elecsys2Non-Majoritarian    ***
## methodPANEL                 ***
## agglevelStates              .
## location2World              .
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
permutest(mod, progbar = F)
```

```
##
## Test of Moderators (coefficients 2:9):
## F(df1 = 8, df2 = 32) = 29.7201, p-val* = 0.0010
##
## Model Results:
##
##                           estimate      se      tval   pval*     ci.lb    ci.ub
## intrcpt                    -5.3830  5.8900   -0.9139  0.2800  -17.3805   6.6145
## indepvar2N                 -0.0014  0.0048   -0.2945  0.7390   -0.0112   0.0084
## indepvar2logN              -4.6069  2.4363   -1.8909  0.0910   -9.5696   0.3558
## year                        0.0060  0.0027    2.2730  0.0090    0.0006   0.0114
## publishedNo                 0.1130  0.0251    4.5060  0.0020    0.0619   0.1641
## elecsys2Non-Majoritarian   -2.1629  0.1568  -13.7904  0.0010   -2.4823  -1.8434
## methodPANEL                 0.1252  0.0304    4.1232  0.0020    0.0633   0.1870
## agglevelStates             -4.7325  2.4361   -1.9426  0.0840   -9.6947   0.2298
## location2World             -4.6443  2.4362   -1.9064  0.0950   -9.6067   0.3181
##
## intrcpt
## indepvar2N
## indepvar2logN               .
```

```
## year                         **
## publishedNo                  **
## elecsys2Non-Majoritarian   ***
## methodPANEL                  **
## agglevelStates                .
## location2World                .
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

For all the coefficients, we have the following results:

1. Compared with `K`, models with `N` and `logN` tend to have significantly negative coefficients.
2. Year has a positive effect: the younger the publication, the higher the detected coefficient.
3. Unpublished papers tend to have higher coefficients than published papers.
4. Passing from `Majoritarian` to `Non-Majoritarian`, decreases significantly the effects found in our models.
5. In terms of the modeling, passing from `OLS` to `PANEL` increases the detected effects.
6. When passing from `Local` to `State` or `World` levels, it decreases the detected effect size.

Meta-regressions for Expenditure Per Capita

```
summary(mod)
```

```
##
## Mixed-Effects Model (k = 18; tau^2 estimator: REML)
##
##   logLik  deviance       AIC       BIC      AICc
## -34.6251   69.2502   85.2502   88.4333  157.2502
##
## tau^2 (estimated amount of residual heterogeneity):     1.8429 (SE = 1.2361)
## tau (square root of estimated tau^2 value):             1.3575
## I^2 (residual heterogeneity / unaccounted variability): 95.05%
## H^2 (unaccounted variability / sampling variability):   20.21
## R^2 (amount of heterogeneity accounted for):            0.00%
##
## Test for Residual Heterogeneity:
## QE(df = 11) = 45.4940, p-val < .0001
##
## Test of Moderators (coefficients 2:7):
## F(df1 = 6, df2 = 11) = 0.3429, p-val = 0.8998
##
## Model Results:
##
##                            estimate        se     tval    pval      ci.lb
## intrcpt                   -104.0701  318.9300  -0.3263  0.7503  -806.0302
## indepvar2N                  -2.9238    2.0932  -1.3968  0.1900    -7.5309
## year                         0.0525    0.1586   0.3308  0.7470    -0.2967
## elecsys2Non-Majoritarian     0.3458    1.5533   0.2226  0.8279    -3.0730
## methodPANEL                  1.4571    2.2376   0.6512  0.5283    -3.4679
## methodIV                     1.4936    2.6675   0.5599  0.5868    -4.3776
## agglevelStates              -0.0915    2.4255  -0.0377  0.9706    -5.4299
##                             ci.ub
## intrcpt                   597.8900
## indepvar2N                  1.6834
```

```
## year                        0.4017
## elecsys2Non-Majoritarian    3.7645
## methodPANEL                 6.3821
## methodIV                    7.3648
## agglevelStates              5.2470
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

As we have considerable heterogeneity in our sample, we run a permutation test to ensure the validity of our estimates. The results follow below.

```
## Error in rma.uni(x$yi, x$vi, weights = x$weights, mods = cbind(X[sample(x$k),  :
##   Fisher scoring algorithm did not converge. See 'help(rma)' for possible remedies.
## Error in rma.uni(x$yi, x$vi, weights = x$weights, mods = cbind(X[sample(x$k),  :
##   Fisher scoring algorithm did not converge. See 'help(rma)' for possible remedies.
## Error in rma.uni(x$yi, x$vi, weights = x$weights, mods = cbind(X[sample(x$k),  :
##   Fisher scoring algorithm did not converge. See 'help(rma)' for possible remedies.
## Error in rma.uni(x$yi, x$vi, weights = x$weights, mods = cbind(X[sample(x$k),  :
##   Fisher scoring algorithm did not converge. See 'help(rma)' for possible remedies.
```

```
##
## Test of Moderators (coefficients 2:7):
## F(df1 = 6, df2 = 11) = 0.3429, p-val* = 0.5900
##
## Model Results:
##
##                            estimate        se     tval   pval*      ci.lb
## intrcpt                   -104.0701  318.9300  -0.3263  0.6300  -806.0302
## indepvar2N                  -2.9238    2.0932  -1.3968  0.0650    -7.5309
## year                         0.0525    0.1586   0.3308  0.6270    -0.2967
## elecsys2Non-Majoritarian     0.3458    1.5533   0.2226  0.7180    -3.0730
## methodPANEL                  1.4571    2.2376   0.6512  0.3330    -3.4679
## methodIV                     1.4936    2.6675   0.5599  0.4380    -4.3776
## agglevelStates              -0.0915    2.4255  -0.0377  0.9440    -5.4299
##                               ci.ub
## intrcpt                    597.8900
## indepvar2N                   1.6834  .
## year                         0.4017
## elecsys2Non-Majoritarian     3.7645
## methodPANEL                  6.3821
## methodIV                     7.3648
## agglevelStates               5.2470
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We have the following results for the meta-regressions of Expenditure Per Capita:

1. Compared with `K`, models with `N` tend to detect significantly smaller effects.
2. Year has null effect.
3. Passing the electoral rules from `Majoritarian` to `Non-Majoritarian`, increases significantly the per capita expenditure found in our models.
4. In terms of the modeling, passing from `OLS` to `PANEL` or `IV` increases the detected effects.
5. When passing from `Local` to `State` level, decreases the detected effects.

Below we also run the meta-regressions adding all coefficients in the papers. The results follow below:

```r
summary(mod)
```

```
##
## Mixed-Effects Model (k = 60; tau^2 estimator: REML)
##
##    logLik   deviance        AIC        BIC       AICc
## -141.1228   282.2456   298.2456   314.0079   301.5183
##
## tau^2 (estimated amount of residual heterogeneity):     1.7264 (SE = 0.4944)
## tau (square root of estimated tau^2 value):             1.3139
## I^2 (residual heterogeneity / unaccounted variability): 99.80%
## H^2 (unaccounted variability / sampling variability):   500.07
## R^2 (amount of heterogeneity accounted for):            39.21%
##
## Test for Residual Heterogeneity:
## QE(df = 53) = 325.8548, p-val < .0001
##
## Test of Moderators (coefficients 2:7):
## F(df1 = 6, df2 = 53) = 5.9441, p-val < .0001
##
## Model Results:
##
##                            estimate        se     tval    pval      ci.lb
## intrcpt                   -296.9072  166.6870  -1.7812  0.0806  -631.2389
## indepvar2N                  -5.4468    0.9692  -5.6201  <.0001    -7.3907
## year                         0.1503    0.0830   1.8117  0.0757    -0.0161
## elecsys2Non-Majoritarian     1.0236    0.7701   1.3293  0.1894    -0.5209
## methodPANEL                 -0.1422    0.8136  -0.1747  0.8620    -1.7739
## methodIV                     0.1907    0.8223   0.2319  0.8175    -1.4587
## agglevelStates              -0.2008    1.0049  -0.1998  0.8424    -2.2164
##                             ci.ub
## intrcpt                   37.4245    .
## indepvar2N                -3.5029  ***
## year                       0.3167    .
## elecsys2Non-Majoritarian   2.5682
## methodPANEL                1.4896
## methodIV                   1.8401
## agglevelStates             1.8149
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
permutest(mod, progbar = F)
```

```
##
## Test of Moderators (coefficients 2:7):
## F(df1 = 6, df2 = 53) = 5.9441, p-val* = 0.0010
##
## Model Results:
##
##                            estimate        se     tval   pval*      ci.lb
## intrcpt                   -296.9072  166.6870  -1.7812  0.0170  -631.2389
## indepvar2N                  -5.4468    0.9692  -5.6201  0.0010    -7.3907
## year                         0.1503    0.0830   1.8117  0.0150    -0.0161
```

```
## elecsys2Non-Majoritarian     1.0236    0.7701   1.3293  0.0730    -0.5209
## methodPANEL                 -0.1422    0.8136  -0.1747  0.7990    -1.7739
## methodIV                     0.1907    0.8223   0.2319  0.7700    -1.4587
## agglevelStates              -0.2008    1.0049  -0.1998  0.7990    -2.2164
##                              ci.ub
## intrcpt                    37.4245    *
## indepvar2N                 -3.5029  ***
## year                        0.3167    *
## elecsys2Non-Majoritarian    2.5682    .
## methodPANEL                 1.4896
## methodIV                    1.8401
## agglevelStates              1.8149
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

With all coefficients, the results of the effect sizes on the Expenditure Per Capita Regressions are the following:

1. Compared with `K`, models with `N` tend to detect significantly smaller effects.
2. Year has now a positive effect on coefficient sizes.
3. Passing the electoral rules from `Majoritarian` to `Non-Majoritarian`, increases significantly the effects on per capita expenditure found in our models.
4. In terms of the modeling, passing from `OLS` to `PANEL` decreases the detected effects.
5. All other coeffients were not significant.

Meta-regressions for the Log of Expenditure Per Capita

```
summary(mod)
```

```
##
## Mixed-Effects Model (k = 7; tau^2 estimator: REML)
##
##   logLik  deviance       AIC       BIC      AICc
##   0.8657   -1.7315   12.2685   -1.7315  124.2685
##
## tau^2 (estimated amount of residual heterogeneity):     0.0096 (SE = 0.0147)
## tau (square root of estimated tau^2 value):             0.0977
## I^2 (residual heterogeneity / unaccounted variability): 92.15%
## H^2 (unaccounted variability / sampling variability):   12.74
## R^2 (amount of heterogeneity accounted for):            65.22%
##
## Test for Residual Heterogeneity:
## QE(df = 1) = 12.7408, p-val = 0.0004
##
## Test of Moderators (coefficients 2:6):
## F(df1 = 5, df2 = 1) = 2.9742, p-val = 0.4128
##
## Model Results:
##
##                estimate       se     tval    pval      ci.lb     ci.ub
## intrcpt          8.9711  47.4747   0.1890  0.8811  -594.2521  612.1943
## indepvar2N      -0.1641   0.3258  -0.5037  0.7029    -4.3043    3.9760
## year            -0.0044   0.0237  -0.1864  0.8827    -0.3053    0.2965
## publishedNo      0.1520   0.1902   0.7993  0.5707    -2.2647    2.5687
## methodPANEL      0.2581   0.1886   1.3680  0.4018    -2.1389    2.6550
```

```
## agglevelStates   -0.0875   0.1901  -0.4602  0.7254    -2.5028    2.3278
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

As we have considerable heterogeneity in our sample, we run a permutation test to ensure the validity of our estimates. The results follow below.

```
##
## Test of Moderators (coefficients 2:6):
## F(df1 = 5, df2 = 1) = 2.9742, p-val* = 0.3720
##
## Model Results:
##
##                estimate       se     tval   pval*      ci.lb     ci.ub
## intrcpt          8.9711  47.4747   0.1890  0.9090  -594.2521  612.1943
## indepvar2N      -0.1641   0.3258  -0.5037  0.7160    -4.3043    3.9760
## year            -0.0044   0.0237  -0.1864  0.9110    -0.3053    0.2965
## publishedNo      0.1520   0.1902   0.7993  0.5880    -2.2647    2.5687
## methodPANEL      0.2581   0.1886   1.3680  0.3660    -2.1389    2.6550
## agglevelStates  -0.0875   0.1901  -0.4602  0.6980    -2.5028    2.3278
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

We have the following results for the meta-regressions of Log of Expenditure Per Capita:

1. Unpublished papers report a significantly higher coefficient.
2. In terms of the modeling, passing from `OLS` to `PANEL` increases the detected effects.
3. All other coefficients remained insignificant.

Below we also run the meta-regressions adding all coefficients in the papers. The results follow below:

```
summary(mod)
```

```
##
## Mixed-Effects Model (k = 27; tau^2 estimator: REML)
##
##   logLik  deviance       AIC       BIC      AICc
##  21.9924  -43.9848  -27.9848  -20.0190  -14.8939
##
## tau^2 (estimated amount of residual heterogeneity):     0.0051 (SE = 0.0021)
## tau (square root of estimated tau^2 value):             0.0716
## I^2 (residual heterogeneity / unaccounted variability): 86.93%
## H^2 (unaccounted variability / sampling variability):   7.65
## R^2 (amount of heterogeneity accounted for):            82.37%
##
## Test for Residual Heterogeneity:
## QE(df = 20) = 98.5701, p-val < .0001
##
## Test of Moderators (coefficients 2:7):
## F(df1 = 6, df2 = 20) = 16.9707, p-val < .0001
##
## Model Results:
##
##                estimate       se     tval    pval     ci.lb    ci.ub
## intrcpt         -1.6655  15.8337  -0.1052  0.9173  -34.6940  31.3630
```

```
## indepvar2N        0.0088   0.1262   0.0701  0.9448   -0.2544   0.2721
## year              0.0009   0.0079   0.1187  0.9067   -0.0155   0.0174
## publishedNo       0.0829   0.0728   1.1387  0.2683   -0.0689   0.2347
## methodPANEL      -0.2436   0.0705  -3.4537  0.0025   -0.3908  -0.0965   **
## methodRDD        -0.2978   0.0656  -4.5398  0.0002   -0.4347  -0.1610  ***
## agglevelStates   -0.0438   0.0673  -0.6505  0.5228   -0.1842   0.0966
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
permutest(mod, progbar = F)
```

```
##
## Test of Moderators (coefficients 2:7):
## F(df1 = 6, df2 = 20) = 16.9707, p-val* = 0.0010
##
## Model Results:
##
##                 estimate       se     tval   pval*     ci.lb    ci.ub
## intrcpt          -1.6655  15.8337  -0.1052  0.9130  -34.6940  31.3630
## indepvar2N        0.0088   0.1262   0.0701  0.9320   -0.2544   0.2721
## year              0.0009   0.0079   0.1187  0.9010   -0.0155   0.0174
## publishedNo       0.0829   0.0728   1.1387  0.3040   -0.0689   0.2347
## methodPANEL      -0.2436   0.0705  -3.4537  0.0030   -0.3908  -0.0965   **
## methodRDD        -0.2978   0.0656  -4.5398  0.0010   -0.4347  -0.1610  ***
## agglevelStates   -0.0438   0.0673  -0.6505  0.5100   -0.1842   0.0966
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

With all coefficients, the results of the effect sizes on the Log of Expenditure Per Capita Regressions are the following:

1. In terms of the modeling, passing from `OLS` to `PANEL` or `RDD` decreases the detected effects.
2. All other coefficients remained insignificant.

Theory of Meta Analysis

There are two main estimators for conducting meta analysis: fixed effects and random effects models. The fixed effects model assumes that there is one true effect in reality, and that all estimates are an attempt to uncover this true effect. The random effects model, on the other hand, assumes that there are a distribution of true effects, that vary based on sample and tests characteristics.

In this paper, we use the random effects model. The empirical papers testing the law of 1/n are very diverse. We tried to capture some of this diversity by considering the main dependent and independent variables separately, but they have at least three other important sources of dispersion:

1. **Subjects**: Counties, Municipalities, States, Provinces, Countries.
2. **Electoral systems**: Majoritarian, PR, Mixed.
3. **Modeling strategies**: Panel data, Standard OLS, IV, RDD.

These sources of heterogeneity have two implications. First, it makes our estimates very disperse. The heterogeneity tests are all but one significant. When the sample sizes are large enough, we removed more heterogeneous studies, but we still had considerable dispersion in our estimates. Second, the amount of heterogeneity makes fixed effects estimates unrealistic and bised. Thus, we opt for random effects model.

Let each study having an effect of T_i. In a random effects model, we can decompose this effect in two components, the true effect that the study with the same specifications as i come from, θ_i, and a within-study

error ε_i:

$$T_i \ = \ \theta_i + \varepsilon_i$$

And the random effects model assumes that the θ_i varies from study to study, having a true parameter μ, plus a between-study error, ξ_i:

$$T_i \ = \ \mu + \xi_i + \varepsilon_i$$

And the random effects model estimates the parameter μ, under the challenge of estimating both the within-and-between-study sampling errors.

In all empirical estimates, we use the package `meta`, and the package `dmetar`, described in (Doing Meta-Analysis with R)[https://bookdown.org/MathiasHarrer/Doing_Meta_Analysis_in_R/random.html]. To empirically implement the random effects model, we need to choose a method to estimate the true effect size variance, τ^2, which in our formulation, represents the variance of ξ_i. We selected the **Restricted Maximum Likelihood Estimator**, as the literature regards it as more precise when we have continuous measures, such as we have on our data (link)[https://www.ncbi.nlm.nih.gov/pubmed/26332144].

Robustness: Full model meta-regressions combined

In this section, we aggregate all the coefficients and run a multivariate meta-regression, controlling by:

1. The type of the dependent variable in the study (expenditure per capita, log of the expenditure per capita, and share of government expenditure in the GDP)
2. The type of the independent variable in the stydy (N, K, log of N);
3. The electoral system (Majoritarian, Proportional Representation, and Mixed).

The results follow below, and show null effect for all variables, including the intercept.

```
summary(mod)
```

```
##
## Mixed-Effects Model (k = 36; tau^2 estimator: REML)
##
##   logLik  deviance       AIC       BIC      AICc
## -47.9845   95.9689  125.9689  142.3345  205.9689
##
## tau^2 (estimated amount of residual heterogeneity):     0.2315 (SE = 0.1007)
## tau (square root of estimated tau^2 value):             0.4812
## I^2 (residual heterogeneity / unaccounted variability): 99.94%
## H^2 (unaccounted variability / sampling variability):   1599.58
## R^2 (amount of heterogeneity accounted for):            0.00%
##
## Test for Residual Heterogeneity:
## QE(df = 22) = 175.9758, p-val < .0001
##
## Test of Moderators (coefficients 2:14):
## F(df1 = 13, df2 = 22) = 0.3352, p-val = 0.9772
##
## Model Results:
##
##                          estimate        se     tval    pval      ci.lb
## intrcpt                  -22.4725  122.8858  -0.1829  0.8566  -277.3220
## depvar2PCTGDP              0.1796    0.8381   0.2143  0.8323    -1.5585
```

```
## depvar2logExpPC            -0.5979    0.8526  -0.7012  0.4905    -2.3661
## indepvar2N                 -0.4922    0.5236  -0.9400  0.3574    -1.5780
## indepvar2logN               0.4376    1.6148   0.2710  0.7889    -2.9113
## year                        0.0114    0.0609   0.1875  0.8530    -0.1148
## publishedNo                 0.2843    0.6541   0.4346  0.6681    -1.0723
## elecsys2Non-Majoritarian    0.2724    0.6284   0.4335  0.6689    -1.0308
## methodPANEL                 0.1754    0.7126   0.2461  0.8079    -1.3025
## methodIV                    0.0336    1.0078   0.0334  0.9737    -2.0565
## methodRDD                   0.2411    1.2612   0.1912  0.8501    -2.3745
## agglevelStates             -0.2400    0.7393  -0.3247  0.7485    -1.7733
## agglevelCountries          -1.4929    1.2027  -1.2414  0.2275    -3.9871
## location2World              0.7437    1.5559   0.4780  0.6374    -2.4830
##                              ci.ub
## intrcpt                   232.3770
## depvar2PCTGDP               1.9176
## depvar2logExpPC             1.1704
## indepvar2N                  0.5937
## indepvar2logN               3.7865
## year                        0.1376
## publishedNo                 1.6408
## elecsys2Non-Majoritarian    1.5755
## methodPANEL                 1.6532
## methodIV                    2.1237
## methodRDD                   2.8567
## agglevelStates              1.2932
## agglevelCountries           1.0013
## location2World              3.9704
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

As we have considerable heterogeneity in our sample, we run a permutation test to ensure the validity of our estimates. The results follow below.

```
##
## Test of Moderators (coefficients 2:14):
## F(df1 = 13, df2 = 22) = 0.3352, p-val* = 0.6590
##
## Model Results:
##
##                           estimate        se     tval   pval*      ci.lb
## intrcpt                  -22.4725  122.8858  -0.1829  0.7890  -277.3220
## depvar2PCTGDP              0.1796    0.8381   0.2143  0.7170    -1.5585
## depvar2logExpPC           -0.5979    0.8526  -0.7012  0.3320    -2.3661
## indepvar2N                -0.4922    0.5236  -0.9400  0.1570    -1.5780
## indepvar2logN              0.4376    1.6148   0.2710  0.7180    -2.9113
## year                       0.0114    0.0609   0.1875  0.7760    -0.1148
## publishedNo                0.2843    0.6541   0.4346  0.5100    -1.0723
## elecsys2Non-Majoritarian   0.2724    0.6284   0.4335  0.4890    -1.0308
## methodPANEL                0.1754    0.7126   0.2461  0.7020    -1.3025
## methodIV                   0.0336    1.0078   0.0334  0.9630    -2.0565
## methodRDD                  0.2411    1.2612   0.1912  0.7870    -2.3745
## agglevelStates            -0.2400    0.7393  -0.3247  0.6110    -1.7733
## agglevelCountries         -1.4929    1.2027  -1.2414  0.2470    -3.9871
## location2World             0.7437    1.5559   0.4780  0.5730    -2.4830
```

```
##                              ci.ub
## intrcpt                    232.3770
## depvar2PCTGDP                1.9176
## depvar2logExpPC              1.1704
## indepvar2N                   0.5937
## indepvar2logN                3.7865
## year                         0.1376
## publishedNo                  1.6408
## elecsys2Non-Majoritarian     1.5755
## methodPANEL                  1.6532
## methodIV                     2.1237
## methodRDD                    2.8567
## agglevelStates               1.2932
## agglevelCountries            1.0013
## location2World               3.9704
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

In the main text, we selected the coefficients based on the regressions that had most observations and that presented a full model (with fixed effects or intermediate bandwidth in RDD). Below we also run the meta-regressions adding all coefficients in the papers. The results follow below:

```
summary(mod)
```

```
##
## Mixed-Effects Model (k = 128; tau^2 estimator: REML)
##
##    logLik   deviance        AIC        BIC       AICc
## -192.2430   384.4860   414.4860   455.5290   419.3840
##
## tau^2 (estimated amount of residual heterogeneity):     0.0624 (SE = 0.0108)
## tau (square root of estimated tau^2 value):             0.2498
## I^2 (residual heterogeneity / unaccounted variability): 99.96%
## H^2 (unaccounted variability / sampling variability):   2838.73
## R^2 (amount of heterogeneity accounted for):            66.57%
##
## Test for Residual Heterogeneity:
## QE(df = 114) = 2083.6861, p-val < .0001
##
## Test of Moderators (coefficients 2:14):
## F(df1 = 13, df2 = 114) = 2.7571, p-val = 0.0019
##
## Model Results:
##
##                            estimate       se     tval    pval     ci.lb
## intrcpt                     38.5855  36.3705   1.0609  0.2910  -33.4642
## depvar2PCTGDP                0.4967   0.3068   1.6189  0.1082   -0.1111
## depvar2logExpPC             -0.3311   0.2342  -1.4139  0.1601   -0.7949
## indepvar2N                  -0.1467   0.1451  -1.0113  0.3140   -0.4342
## indepvar2logN                0.1689   0.4677   0.3611  0.7187   -0.7576
## year                        -0.0190   0.0180  -1.0533  0.2944   -0.0547
## publishedNo                 -0.0690   0.1689  -0.4088  0.6834   -0.4036
## elecsys2Non-Majoritarian     0.6244   0.2274   2.7464  0.0070    0.1740
## methodPANEL                 -0.1833   0.1588  -1.1546  0.2507   -0.4978
```

```
## methodIV                   -0.1452   0.2364  -0.6139  0.5405   -0.6135
## methodRDD                  -0.2569   0.2618  -0.9812  0.3286   -0.7756
## agglevelStates             -0.5263   0.2324  -2.2648  0.0254   -0.9867
## agglevelCountries          -1.8292   0.4527  -4.0406  <.0001   -2.7261
## location2World              0.4062   0.4891   0.8305  0.4080   -0.5627
##                              ci.ub
## intrcpt                    110.6352
## depvar2PCTGDP                1.1044
## depvar2logExpPC              0.1328
## indepvar2N                   0.1407
## indepvar2logN                1.0954
## year                         0.0167
## publishedNo                  0.2655
## elecsys2Non-Majoritarian     1.0748   **
## methodPANEL                  0.1312
## methodIV                     0.3232
## methodRDD                    0.2618
## agglevelStates              -0.0659    *
## agglevelCountries           -0.9324  ***
## location2World               1.3751
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
permutest(mod, progbar = F)
```

```
##
## Test of Moderators (coefficients 2:14):
## F(df1 = 13, df2 = 114) = 2.7571, p-val* = 0.0010
##
## Model Results:
##
##                           estimate       se     tval   pval*     ci.lb
## intrcpt                    38.5855  36.3705   1.0609  0.1110  -33.4642
## depvar2PCTGDP               0.4967   0.3068   1.6189  0.0200   -0.1111
## depvar2logExpPC            -0.3311   0.2342  -1.4139  0.0400   -0.7949
## indepvar2N                 -0.1467   0.1451  -1.0113  0.1170   -0.4342
## indepvar2logN               0.1689   0.4677   0.3611  0.6110   -0.7576
## year                       -0.0190   0.0180  -1.0533  0.1120   -0.0547
## publishedNo                -0.0690   0.1689  -0.4088  0.5400   -0.4036
## elecsys2Non-Majoritarian    0.6244   0.2274   2.7464  0.0010    0.1740
## methodPANEL                -0.1833   0.1588  -1.1546  0.1020   -0.4978
## methodIV                   -0.1452   0.2364  -0.6139  0.3440   -0.6135
## methodRDD                  -0.2569   0.2618  -0.9812  0.1440   -0.7756
## agglevelStates             -0.5263   0.2324  -2.2648  0.0040   -0.9867
## agglevelCountries          -1.8292   0.4527  -4.0406  0.0010   -2.7261
## location2World              0.4062   0.4891   0.8305  0.2490   -0.5627
##                              ci.ub
## intrcpt                    110.6352
## depvar2PCTGDP                1.1044    *
## depvar2logExpPC              0.1328    *
## indepvar2N                   0.1407
## indepvar2logN                1.0954
## year                         0.0167
## publishedNo                  0.2655
```

```
## elecsys2Non-Majoritarian    1.0748  ***
## methodPANEL                 0.1312
## methodIV                    0.3232
## methodRDD                   0.2618
## agglevelStates             -0.0659   **
## agglevelCountries          -0.9324  ***
## location2World              1.3751
##
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```