**Kohesio initial data summary and overview**

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The purpose of the following document is to provide some insight into the environment of the data collected. We begin by outlining the different variables observed throughout the original data set en masse. We are then splitting the data based on the fund — the European Social Fund (ESF) and the European Regional Development fund (ERDF) — to comprehend the differences between the two cardinal funds present in our data. With our two data sets in hand we do some simple calculations on the numerical variables to find the average, min, max, etc. Finally, we will run a regression to see if we can find correlation between GDP/capita and funding/capita at district level.

### **An introduction to the data**

Kohesio is a database that allows for access to information regarding EU contributions and funding from the EU Cohesion policy towards operation in hopes of “strengthening economic, social, and territorial cohesion,” with the goal of correcting “imbalances between countries and regions (About Kohesio, n.d.).”

In total the data initially consists of 298,890 operation entries with 29 corresponding columns or variables. As mentioned before, the data is split up based on the funds: the ERDF data has 43,980 entries, while the ESF data has 254,840 entries. Many of the variables (columns) present in the Kohesio data come in pairs; where one would describe the code allocated to the variable and the other would indicate what the code means as a label. More importantly, at a first glance, there are far more unique variables and a wider variety of operations among the ERDF data entries in contrast to the ESF data entries.

Among the descriptions of the variables below is a simple summary of the numerical values present in the data for ESF and ERDF and a count of observations per programme. The three numerical variables are: “Cofinancing\_Rate”, “Total\_Eligible\_Expenditure”, and “Project\_EU\_Budget”.

What follows is an outline of all the columns in order and the sort of information present in each of the columns:  
  
**Operation\_Unique\_Identifier:** A column with all the wiki links for each operation. The links have a

unique identifier

**Operation\_Name\_English:** Coupled with **Operation\_Name\_Programme\_langauge.** Both

columns indicate the names of the operation. The latter is in German. There are 87156 unique operations among both ERDF and ESF

**Country:** It is the country of Germany

**Postal\_Code:** Postal codes

**Operation \_Start\_date:** Coupled with **Operation \_End\_date.** These two columns indicate the

DD/MM/YYYY when the operation started and ended.

**Cofinancing\_Rate:** Indicated the percentage of the total operation funded by the EU.

**Cofinancing\_Rate Numerical Summary**

**Co financing rate (%) among both ESF and ERDF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |

0.00 | 0.00 | 0.00 | 21.38 | 50.00 | 98.96 |

**Co financing rate (%) ESF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |

0.00 | 0.00 | 0.00 | 13.36 | 0.00 | 98.96 |

**Co financing rate (%) ERDF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |

0.00 | 50.00 | 80.00 | 67.85 | 80.00 | 90.00 |

**Total\_Eligible\_Expenditure**: A set of two columns each with the suffix **\_amount** and **\_Currency.**

**\_amount** indicated the total contribution for the operation from both the EU and Germany. While **\_Currency** indicated the value is in euros

**Total\_Eligible\_Expenditure Numerical Summary**

**Total eligible expenditure amount (EUR) among both ESF and ERDF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. | NA's |

0 | 1999 | 3580 | 117566 | 14500 | 162500000 | 2148 |

**Total eligible expenditure amount (EUR) ESF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. | NA's |

0 | 1650 | 3000 | 45526 | 8800 | 53956200 | 2064 |

**Total eligible expenditure amount (EUR) ERDF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. | NA's |

1 | 7000 | 56376 | 532410 | 331164 | 162500000 | 84 |

**Project\_EU\_Budget:** The amount of money contributed or co financed by the EU.

**Project\_EU\_Budget Numerical Summary**

**EU contributions among (EUR) both ESF and ERDF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |

0 | 0 | 0 | 48901 | 1032 | 130000000 |

**EU contributions among (EUR) ESF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |

0 | 0 | 0 | 7267 | 0 | 19849539 |

**EU contributions among (EUR) ERDF**

Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |

0 | 4972 | 29986 | 290145 | 179275 | 130000000 |

**Benificiary\_Name**: Currently a link to the wiki page, however I have written some code to

extract the beneficiary names from the wiki.

**Location\_Indicator:** Latitude and longitude coordinates for the location of the operation

**Category\_Of\_intervention:** Coupled with **Category\_Labels**. These two variables describe forms of

intervention fields in Germany. Between the ESF and ERDF there are 78 unique intervention categories of the 128 possible kinds of intervention. These categories are divided up among the following sections:

*(001-004) Productive investment*

*(005-048) Infrastructure providing basic services & related investment  
(048-055) Social, health & education infrastructure & related investment  
(056-114) Promoting social inclusion combating poverty & discrimination*

*(115-118) Investing in education, training & vocational training for skills & lifelong learning*

*(119-120) Enhancing institutional capacity of public authorities & stakeholders & efficient public administration  
(121-123) Technical assistance*

\*\* Although the ERDF data contains categories of intervention across most intervention sections, the same cannot be said regarding the ESF data.

Notably, of the 254,840 entries present as a part of the ESF fund; these are all the unique categories for the ESF: 7, 102, 103, 104, 105, 106, 109, 112, 114, 115, 116, 117, 118, 121, 122, 123. Among those, 102, 103, 104, 105, 106, 109, 112, 114, 115, 116, 117 are not represented in the ERDF.

The ERDF does not cover the following sections: *Investing in education, training & vocational training for skills & lifelong learning (115-118).*

The ESF does not cover the following sections: *Productive investment (001-004)*,and *Social, health & education infrastructure & related investment (048-055).*

Neither the ERDF nor the ESF cover the following section: *Enhancing institutional capacity of public authorities & stakeholders & efficient public administration (119-120).*

**Thematic\_Objective\_ID** Coupled with **Thematic\_Objective\_Label.** This a list of 13 possible

themes tackled by the operation. Between the ESF and ERDF 11 of the

13 available themes are contained in the data. The themes are as follows:  
 *TO01 Research and innovation*

*TO02 Information and communication technology*

*TO03 Competitiveness of SMEs*

*TO04 Low-carbon economy*

*TO05 Climate change adaptation and risk prevention*

*TO06 Environment protection and resource efficiency*

*TO07 Network infrastructure in transport and energy*

*TO08 Sustainable and quality employment*

*TO09 Social inclusion*

*TO10 Educational and vocational training*

*TO11 Efficient public administration*

*TO12 Technical assistance*

*TO13 React EU*

**ERDF Thematic Count**

Blank | TO01 | TO02 | TO03 | TO04 | TO05 | TO06 | TO07 | TO09 | TO10 | TO12

2161 | 10893 | 36 | 22392 | 5489 | 557 | 968 | 65 | 788 | 293 | 338

**ESF Thematic Count**

Blank | TO07 | TO08 | TO09 | TO10 | TO12 |

8989 | 1 | 176858 | 14307 | 54126 | 559 |

\*\* As mentioned above, there exists far more variety among the ERDF fund operations contrary to the ESF fund. This sentiment is observed in the thematic objectives category as well. Of the 5 themes covered by the ESF fund: “TO07”, “TO08”, “TO09”, “TO10”, “TO12”. Among those themes, only *TO08 Sustainable and quality employment* is not found among the themes covered by the ERDF.

Neither the ERDF or the ESF cover the following sections: *TO11 Efficient public administration*, and *TO13 React EU*

**Policy\_Objective\_ID** Coupled with **Policy\_Objective\_Label.** This a list of 5 possible policy

objectives for the operations. Between the ESF and ERDF 4 of the 5 available themes are contained in the data. The themes are as follows:  
*PO01 Smarter Europe*

*PO02 Greener, carbon-free Europe*

*PO03 Connected Europe*

*PO04 Social Europe*

*PO05 Europe closer to citizens*

**ERDF Policy Count**

Blank | PO01 | PO02 | PO03 | PO04 |

2499 | 33321 | 7014 | 65 | 1081 |

**ESF Policy Count**

Blank | PO03 | PO04 |

9548 | 1 | 245291 |

The ESF does not cover the following sections: *PO01 Smarter Europe*, and *PO02 Greener, carbon-free Europe.* Neither the ERDF nor the ESF cover the following section: *PO05 Europe closer to citizens.*

**Fund\_Code** Coupled with **Fund\_Name.** We have selected the ESF and the ERDF.

However, bellow is a list of all the possible available through Kohesio  
 *Cohesion Fund (CF)*

*The European Neighbourhood Instrument (ENPI/ENI)*

*European Regional Development Fund (ERDF)*

*European Social Fund (ESF)*

*Instrument for Pre-accession Assistance (IPA/IPA II)*

*Youth Employment Initiative (YEI)*

Of these funds, ENPI/ENI, ERDF, ESF, and IPA/IPA II were present in the latest\_DE.csv data files.

**Programme\_Code** Coupled with **Programme\_Name.** These two variables each indicate the

location of the operation in addition to the fund associated with the operation.

Among the programme’s covered by the ESF we find that they are exclusively within the 16 German states and the federal government of Germany. However, the ERDF contains programmes across all the German states and operations between countries and regions around Germany. These cross-national operations are usually labeled with the prefix Interreg. Below is a list of observations per programme.

**German States**

Baden-Württemberg - ESF: 7198 | ERDF: 267

Bayern - ESF: 4448 | ERDF: 695

Berlin - ESF: 1492 | ERDF: 2702

Brandenburg - ESF: 7978 | ERDF: 2329

Bremen - ESF: 850 | ERDF: 381

Hamburg - ESF: 86 | ERDF: 73  
Hessen - ESF: 3296 | ERDF: 563

Mecklenburg-Vorpommern - ESF: 5387 | ERDF: 3243

Niedersachsen - ESF: 13753 | ERDF: 1917

Nordrhein-Westfalen - ESF: 56415 | ERDF: 3176

Rheinland-Pfalz - ESF: 1428 | ERDF: 569

Saarland - ESF: 659 | ERDF: 327

Sachsen-Anhalt - ESF: 7184 | ERDF: 4985

Sachsen - ESF: 26126 | ERDF: 14116

Schleswig-Holstein - ESF: 380 | ERDF: 1346

Thüringen - ESF: 11573 | ERDF: 5730

Federal Germany - ESF: 106587 | ERDF: N/A

**Interreg: ERDF fund**

Urbact: | ERDF: 20

ESPON | ERDF: 23

Interreg Europe | ERDF: 91

**Interreg V-A: ERDF fund**

Austria–Germany/Bayern | ERDF: 78

Belgium-Germany-The Netherlands (Euregio Maas-Rijn) | ERDF: 52

Belgium-The Netherlands | ERDF: 4

France-Belgium-Germany-Luxembourg (Grande Région) | ERDF: 63

France-Germany-Switzerland (Rhin supérieur) | ERDF: 122

Germany-Austria-Switzerland-Liechtenstein

(Alpenrhein-Bodensee-Hochrhein) | ERDF: 94

Germany-Denmark | ERDF: 73

Germany-The Netherlands | ERDF: 171

Germany (Mecklenburg-Vorpommern-Brandenburg)-Poland | ERDF: 37

Germany/Bayern-Czech Republic | ERDF: 130

Germany/Brandenburg-Poland | ERDF: 43

Germany/Sachsen-Czech Republic | ERDF: 96

Poland-Denmark-Germany-Lithuania-Sweden (South Baltic) | ERDF: 59

Poland-Germany/Sachsen | ERDF: 45

**Interreg V-B: ERDF fund**

Alpine Space | ERDF: 60

Atlantic Area | ERDF: 1

Baltic Sea | ERDF: 43

Central Europe | ERDF: 102

Danube | ERDF: 11

North Sea | ERDF: 66

North West Europe | ERDF: 75

Northern Periphery and Arctic | ERDF: 2

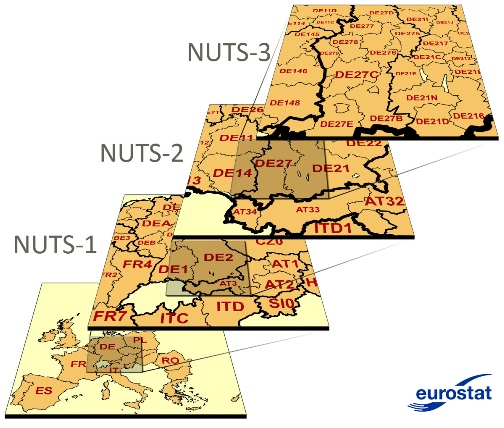
**NUTS3\_Code** Coupled with **Region.** These two variables give us fine geographic

locations for each of the operations. “The NUTS classification   
(Nomenclature of territorial units for statistics) is a hierarchical system for dividing up the economic territory of the EU and the UK for the purpose of: The collection, development, and harmonization of European regional statistics. The Socio-economic analyses of the regions is:

*NUTS 1: major socio-economic regions*

*NUTS 2: basic regions for the application of regional policies*

*NUTS 3: small regions for specific diagnoses* (Background - NUTS -

Nomenclature of Territorial Units for Statistics, n.d.)” 

**Programming\_Period** All the entries are 2014-2020  
  
**Operation\_Summary\_English** Coupled with **Operation\_Summary\_Programme\_Language.** They

provide a summary of what the operation entails, with the later being a summary in the original language (German)

**ManagingAuthority** A list of 57 unique ministry or organization responsible for the

management of the operations.

### **Regression of funding per capita on GDP per Capita**

Before diving into the regression, a list of all the regions that aren’t included in the regression is provided. Since these are regions that are only engaged in interreg projects or did not receive any funding from the ERDF or the ESF.

**ERDF - 394 observations**

**Baden-Württemberg**

DE12B

**Bavaria (mostly only interreg projects for the following)**

DE21C | DE21I | DE258 |

**Lower Saxony (there are only interreg projects for the following)**

DE94D | DE94E

**Rhineland-Palatinate (DEB39 only have interreg projects)**

DEB39

**ESF – 399 observations**

**Saxony**

DED2D

**Saxony-Anhalt (Sachsen-Anhalt)**

DEE01

For the purposes of this exploration let's describe how the 3 levels of NUTS codes differ in Germany.

* NUTS1 are 3-digit regional codes that describe the state within Germany.
* NUTS2 are 4-digit regional codes for finer geographic regions. These tend to be administrative regions or Regierungsbezirk.
* NUTS3 are 5-digit regional codes that describe districts or cities, and rural or urban regions at a very fine level.

**ERDF Regression outputs - 394 observations**

**ERDF Regression**

lm(formula = funding\_per\_capita\_germany\_erdf ~ GDP\_per\_capita, data = Germany\_erdf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-319.8441 | -239.3710 | -148.5128 | 68.0599 | 3313.4610 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|) (Intercept) | 359.2348 | 48.9450 | 7.33956 | 1.2465e-12 \*\*\*

GDP\_per\_capita | -0.0017 | 0.0012 | -1.36698 | 0.17242

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 401.0651 on 392 degrees of freedom

Multiple R-squared: 0.004744278 | Adjusted R-squared: 0.0022054

F-statistic: 1.868622 on 1 and 392 DF | p-value: 0.1724164

**ERDF Regression (log)**

lm(formula = log\_funding\_per\_capita ~ log\_GDP\_per\_capita, data = Germany\_erdf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-7.5683 | -0.7890 | 0.1606 | 1.0551 | 3.4715 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | 10.55961 | 2.4607430 | 4.29123 | 2.2414e-05 \*\*\*

log\_GDP\_per\_capita | -0.54942 | 0.2361258 | -2.32680 | 0.020485 \*

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.615291 on 392 degrees of freedom

Multiple R-squared: 0.0136231 | Adjusted R-squared: 0.0111068

F-statistic: 5.414012 on 1 and 392 DF | p-value: 0.02048458

**ERDF Correlation coefficient**

Non log: -0.08174761423 | log: -0.1479303288

**ERDF Regression (log) with state as a factor**

lm(formula = log\_funding\_per\_capita ~ log\_GDP\_per\_capita + factor(NUTS1\_states), data = Germany\_erdf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-7.3464 | -0.5460 | 0.0884 | 0.8130 | 2.9396 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | -3.69893 | 2.3243054 | -1.59142 | 0.1123543

log\_GDP\_per\_capita | 0.690676 | 0.2180605 | 3.16736 | 0.0016637 \*\*

factor(NUTS1\_states)DE2 | 0.385893 | 0.2469588 | 1.56258 | 0.1189904

factor(NUTS1\_states)DE3 | 2.415846 | 1.3529783 | 1.78558 | 0.0749716 .

factor(NUTS1\_states)DE4 | 2.571144 | 0.3859827 | 6.66129 | 9.6320e-11 \*\*\*

factor(NUTS1\_states)DE5 | 2.436087 | 0.9674214 | 2.51812 | 0.0122116 \*

factor(NUTS1\_states)DE6 | 0.988395 | 1.3557766 | 0.72903 | 0.4664389

factor(NUTS1\_states)DE7 | 0.773919 | 0.3331550 | 2.32300 | 0.0207107 \*

factor(NUTS1\_states)DE8 | 3.608816 | 0.5246948 | 6.87793 | 2.5351e-11 \*\*\*

factor(NUTS1\_states)DE9 | 1.953027 | 0.2943233 | 6.63565 | 1.1257e-10 \*\*\*

factor(NUTS1\_states)DEA | 1.150825 | 0.2780904 | 4.13831 | 4.3186e-05 \*\*\*

factor(NUTS1\_states)DEB | 1.341949 | 0.3105775 | 4.32082 | 1.9910e-05 \*\*\*

factor(NUTS1\_states)DEC | 1.479860 | 0.5860591 | 2.52510 | 0.0119757 \*

factor(NUTS1\_states)DED | 2.671620 | 0.4326826 | 6.17455 | 1.7175e-09 \*\*\*

factor(NUTS1\_states)DEE | 3.069541 | 0.4240580 | 7.23849 | 2.5647e-12 \*\*\*

factor(NUTS1\_states)DEF | 2.783389 | 0.4066016 | 6.84549 | 3.1022e-11 \*\*\*

factor(NUTS1\_states)DEG | 3.004828 | 0.3586376 | 8.37845 | 1.0731e-15 \*\*\*

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.337391 on 377 degrees of freedom

Multiple R-squared: 0.3496999 | Adjusted R-squared: 0.322101

F-statistic: 12.67077 on 16 and 377 DF | p-value: < 2.2204e-16

**ESF Regression outputs– 399 observations**

**ESF Regression**

lm(formula = funding\_per\_capita\_germany\_esf ~ GDP\_per\_capita, data = Germany\_esf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-164.36 | -86.22 | -54.60 | 10.81 | 1281.78 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | 8.731e+01 | 2.113e+01 | 4.132 | 4.39e-05 \*\*\*

GDP\_per\_capita | 5.222e-04 | 5.399e-04 | 0.967 | 0.334

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 174 on 397 degrees of freedom

Multiple R-squared: 0.002351 | Adjusted R-squared: -0.0001618

F-statistic: 0.9356 on 1 and 397 DF | p-value: 0.334

**ESF Regression (log)**

lm(formula = log\_funding\_per\_capita ~ log\_GDP\_per\_capita, data = Germany\_esf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-7.6450 | -0.7418 | 0.1985 | 1.0364 | 3.7002 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | -9.7224 | 2.7652 | -3.516 | 0.000489 \*\*\*

log\_GDP\_per\_capita | 1.2814 | 0.2654 | 4.828 | 1.97e-06 \*\*\*

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.822 on 397 degrees of freedom

Multiple R-squared: 0.05547 | Adjusted R-squared: 0.05309

F-statistic: 23.31 on 1 and 397 DF | p-value: 1.968e-06

**ESF Correlation coefficient**

Non log: 0.04848931 | log: 0.2355125

**ESF Regression (log) with state as a factor**

lm(formula = log\_funding\_per\_capita ~ log\_GDP\_per\_capita + factor(NUTS1\_states), data = Germany\_esf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-5.8640 | -0.5253 | 0.0296 | 0.5452 | 8.4265 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|) |

(Intercept) | -12.0261 | 2.1671 | -5.549 | 5.37e-08 \*\*\* |

log\_GDP\_per\_capita | 1.5135 | 0.2035 | 7.439 | 6.77e-13 \*\*\* |

factor(NUTS1\_states)DE2 | -0.5264 | 0.2297 | -2.292 | 0.02243 \* |

factor(NUTS1\_states)DE3 | 1.2562 | 1.2739 | 0.986 | 0.32474 |

factor(NUTS1\_states)DE4 | 1.8546 | 0.3618 | 5.126 | 4.72e-07 \*\*\* |

factor(NUTS1\_states)DE5 | 0.7033 | 0.9107 | 0.772 | 0.44042 |

factor(NUTS1\_states)DE6 | -0.6890 | 1.2767 | -0.540 | 0.58974 |

factor(NUTS1\_states)DE7 | -0.8030 | 0.3123 | -2.571 | 0.01051 \* |

factor(NUTS1\_states)DE8 | 2.5027 | 0.4929 | 5.078 | 5.98e-07 \*\*\* |

factor(NUTS1\_states)DE9 | 0.7468 | 0.2726 | 2.739 | 0.00645 \*\* |

factor(NUTS1\_states)DEA | 0.6029 | 0.2600 | 2.319 | 0.02092 \* |

factor(NUTS1\_states)DEB | -1.3680 | 0.2883 | -4.744 | 2.96e-06 \*\*\* |

factor(NUTS1\_states)DEC | -0.4116 | 0.5510 | -0.747 | 0.45555 |

factor(NUTS1\_states)DED | -4.7430 | 0.4181 | -11.345 | < 2e-16 \*\*\* |

factor(NUTS1\_states)DEE | -2.3382 | 0.4089 | -5.718 | 2.18e-08 \*\*\* |

factor(NUTS1\_states)DEF | -0.3355 | 0.3815 | -0.879 | 0.37972 |

factor(NUTS1\_states)DEG | 2.1411 | 0.3359 | 6.374 | 5.30e-10 \*\*\* |

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.26 on 382 degrees of freedom

Multiple R-squared: 0.5656 | Adjusted R-squared: 0.5474

F-statistic: 31.08 on 16 and 382 DF | p-value: < 2.2e-16

**ERDF Regression outputs - 1,653 observations**

**(region-theme funding)/(region funding) ~ regions GDP/capita**

lm(formula = share1 ~ GDP\_per\_capita, data = Germany\_theme\_shares\_erdf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-0.3361 | -0.1937 | -0.1053 | 0.1063 | 0.7786 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | 1.893e-01 | 1.639e-02 | 11.549 | < 2e-16 \*\*\*

GDP\_per\_capita | 1.426e-06 | 4.370e-07 | 3.263 | 0.00113 \*\*

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2639 on 1651 degrees of freedom

Multiple R-squared: 0.006407 | Adjusted R-squared: 0.005805

F-statistic: 10.65 on 1 and 1651 DF | p-value: 0.001126

**(region-theme funding)/(theme funding) ~ regions GDP/capita \* factor(theme)**

lm(formula = share2 ~ GDP\_per\_capita \* factor(Thematic\_Objective\_ID), data = Germany\_theme\_shares\_erdf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-0.0926 | -0.0033 | -0.0023 | 0.0004 | 0.2388 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | 3.378e-03 | 2.958e-03 | 1.142 | 0.25364

GDP\_per\_capita | 2.874e-08 | 7.210e-08 | 0.399 | 0.69024

factor(Theme)TO01 | -1.152e-03 | 3.800e-03 | -0.303 | 0.76179

factor(Theme)TO02 | 7.029e-03 | 2.044e-02 | 0.344 | 0.73099

factor(Theme)TO03 | 1.172e-03 | 3.921e-03 | 0.299 | 0.76497

factor(Theme)TO04 | -6.631e-04 | 3.868e-03 | -0.171 | 0.86391

factor(Theme)TO05 | 5.942e-03 | 5.958e-03 | 0.997 | 0.31879

factor(Theme)TO06 | 1.719e-03 | 4.037e-03 | 0.426 | 0.67031

factor(Theme)TO07 | -7.038e-02 | 1.427e-02 | -4.934 | 8.90e-07 \*\*\*

factor(Theme)TO09 | 1.579e-03 | 6.218e-03 | 0.254 | 0.79960

factor(Theme)TO10 | 2.173e-02 | 6.740e-03 | 3.224 | 0.00129 \*\*

factor(Theme)TO12 | 1.395e-01 | 1.243e-02 | 11.228 | < 2e-16 \*\*\*

GDP\_per\_capita:factor(Theme)TO01 | 7.438e-10 | 9.517e-08 | 0.008 | 0.99377

GDP\_per\_capita:factor(Theme)TO02 | 1.723e-06 | 6.683e-07 | 2.578 | 0.01003 \*

GDP\_per\_capita:factor(Theme)TO03 | -6.595e-08 | 1.002e-07 | -0.658 | 0.51038

GDP\_per\_capita:factor(Theme)TO04 | -1.913e-08 | 9.798e-08 | -0.195 | 0.84524

GDP\_per\_capita:factor(Theme)TO05 | 2.905e-08 | 1.721e-07 | 0.169 | 0.86598

GDP\_per\_capita:factor(Theme)TO06 | -2.363e-08 | 1.042e-07 | -0.227 | 0.82067

GDP\_per\_capita:factor(Theme)TO07 | 3.466e-06 | 4.476e-07 | 7.745 | 1.67e-14 \*\*\*

GDP\_per\_capita:factor(Theme)TO09 | 1.587e-07 | 1.790e-07 | 0.887 | 0.37522

GDP\_per\_capita:factor(Theme)TO10 | -2.798e-07 | 1.778e-07 | -1.574 | 0.11571

GDP\_per\_capita:factor(Theme)TO12 | -1.735e-06 | 2.612e-07 | -6.642 | 4.21e-11 \*\*\*

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.01724 on 1631 degrees of freedom

Multiple R-squared: 0.2809 | Adjusted R-squared: 0.2717

F-statistic: 30.35 on 21 and 1631 DF | p-value: < 2.2e-16

**ESF Regression outputs - 1,365 observations**

**(region-theme funding)/(region funding) ~ regions GDP/capita**

lm(formula = share1 ~ GDP\_per\_capita, data = Germany\_theme\_shares\_esf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-0.3121 | -0.2223 | -0.0632 | 0.1647 | 0.7189 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | 3.325e-01 | 1.700e-02 | 19.553 | <2e-16 \*\*\*

GDP\_per\_capita | -1.095e-06 | 4.235e-07 | -2.586 | 0.0098 \*\*

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2559 on 1363 degrees of freedom

Multiple R-squared: 0.004884 | Adjusted R-squared: 0.004154

F-statistic: 6.689 on 1 and 1363 DF | p-value: 0.009803

**(region-theme funding)/(theme funding) ~ regions GDP/capita \* factor(theme)**

lm(formula = share2 ~ GDP\_per\_capita \* factor(Thematic\_Objective\_ID), data = Germany\_theme\_shares\_esf)

Residuals:

Min | 1Q | Median | 3Q | Max |

-0.0219 | -0.0026 | -0.0016 | -0.0002 | 0.293076 |

Coefficients: | Estimate | Std. Error | t value | Pr(>|t|)

(Intercept) | 7.093e-03 | 2.626e-03 | 2.701 | 0.00699 \*\*

GDP\_per\_capita | -3.928e-08 | 6.262e-08 | -0.627 | 0.53055

factor(Theme)TO08 | -6.911e-03 | 3.144e-03 | -2.198 | 0.02811 \*

factor(Theme)TO09 | -4.522e-03 | 3.221e-03 | -1.404 | 0.16063

factor(Theme)TO10 | -7.723e-03 | 3.164e-03 | -2.441 | 0.01476 \*

factor(Theme)TO12 | 1.292e-03 | 6.107e-03 | 0.211 | 0.83254

GDP\_per\_capita:factor(Theme)TO08 | 1.047e-07 | 7.660e-08 | 1.367 | 0.17187

GDP\_per\_capita:factor(Theme)TO09 | 4.752e-08 | 7.798e-08 | 0.609 | 0.54240

GDP\_per\_capita:factor(Theme)TO10 | 1.300e-07 | 7.683e-08 | 1.693 | 0.09077 .

GDP\_per\_capita:factor(Theme)TO12 | 2.204e-07 | 1.408e-07 | 1.565 | 0.11785

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.0142 on 1355 degrees of freedom

Multiple R-squared: 0.04532 | Adjusted R-squared: 0.03898

F-statistic: 7.147 on 9 and 1355 DF | p-value: 3.527e-10

**References:**

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